



उत्तर प्रदेश मेट्रो रेल कॉरपोरेशन लि०

UTTAR PRADESH METRO RAIL CORPORATION LTD.

(भारत सरकार एवं उत्तर प्रदेश सरकार का संयुक्त उपक्रम)
(A JOINT VENTURE OF GOVT. OF INDIA & GOVT. OF U.P.)

UPMRC/Elect/Tender/LKE(02)-01

Date : 02.07.2026

To,

All Bidders

Sub : Pre-Bid Reply , Addendum-04 and Updated BOQ to Tender Package LKE(02)-01

Ref : Tender no. LKE(02)-01:- "Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main Sub Stations Including 750 Volts DC 3rd Rail Traction System, 33kV Cable Network, ASS, TSS & SCADA System for East West Corridor (Phase 1 B) of Lucknow Metro Rail Project at Lucknow, Uttar Pradesh, India"

Dear Sir,

With reference to the above subject Pre-Bid Reply, Addendum-04 and Updated BOQ to tender LKE(02)-01 is attached herewith.

Thanking you,

Regards,

(Vikash Kumar Dubey)
AGM/Traction/LKO
For GM/Electrical

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
1.	Vol-2: GCC / CI 8.5- Liquidated Damages for Delay/ Page 56 of 93	Time is the essence of the Contract. Appendix-1 to the Form of Tender shall include in respect of the Works and in respect of any Stage, a percentage of the total Contract value which will be recoverable from the Contractor as Liquidated Damages for delay in completion of the Works or in achievement of a stage by a particular Key Date. The total amount of Liquidated Damages in respect of the Works in all stages shall, however, not exceed the limit of 10% of total Contract Value as stated in the Appendix-1 to the Form of Tender.	With reference to the tender conditions, the Bidder requests to consider reducing the ceiling limit of Liquidated Damages for delay to 5% of the Contract Price .	Tender condition shall prevail
2.	Vol-2: GCC / CI. 11.12- Calculation of Payments in Foreign Currency / Page 70 of 93	All payments made by the Employer pursuant to the terms of the Contract shall be in the currency or currencies specified in the Contract. Wherever any sum in a foreign currency has to be converted into Indian Rupees for any purpose, the exchange rate to be employed for such conversion shall be the selling rate of exchange at the close of business of the State Bank of India, 28 days before the latest date of submission of Tenders.	The Bidder understands that the Employer shall make payments to the Contractor in the respective currencies quoted in the Bid, and that payments corresponding to foreign currency components shall be released in the quoted foreign currency without conversion into INR. Kindly Confirm our understanding.	Please refer Tender document
3.	Vol-2: GCC / CI 6.4 g - Labour Laws/ Page 46 of 93	The Contractor shall ensure the registration of all his eligible workers inclusive of Sub-contractor and Petty Contractors with BOCW (Building and Other Construction Workers) Board. Any liabilities on account of BOCW at any stage shall be on part of tenderer and the quoted price shall be inclusive of BOCW charges. The Employer shall make the deduction accordingly and deposit the amount to the concerned authorities.	With reference to the tender clause regarding applicability of BOCW (Building and Other Construction Workers) charges, the Bidder understands that BOCW cess is generally applicable to construction and installation-related activities. In this regard, kindly clarify whether the BOCW charges shall be applicable on the entire Contract Value or limited only to the "Installation Schedule" / installation-related portion of the Contract.	Please follow tender conditions
4.	Vol-7: Pricing Document / CI 8 (d) - Price Variation / Page 4 of 83	Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis: (i) Addition/Deletion of Stations (ii) Increase/ Decrease in the length of the corridors (iii) Change in quantity of Inverters, Inverters Transformer along with associated Switchgears (iv) Change in the location of RSS/AMS	The Bidder understands that the term " associated switchgears " has been used in the tender documents. However, since the term is subjective and open to interpretation, kindly clarify the exact list and scope of equipment/items intended to be covered under "associated switchgears".	Tender condition shall prevail
5.	Vol-4: ERTS / CI 2.7.2 / Vendor approval and Selection procedure Stage-I Page 15 of 18	Assessment of capability of proposed Vendor to supply a particular equipment or product, with quality and performance requirements, as required by Specifications as well as other contract conditions. The proposed product should be a proven product in service for at least 5 years.	Supply materials with requested criteria are difficult, since many old suppliers are not manufacturing the same as on date and new suppliers are available with good quality in the market and the major supply items are separately listed in the qualification requirement, hence we kindly request you to accept the below changes for the general items: "Assessment of capability of proposed Vendor to supply a particular equipment or product, with quality and performance requirements, as required by Specifications as well as other contract conditions. The proposed product should be a proven product in service for at least 2 years" (instead of 5 years).	Tender condition shall prevail
6.	Vol-4: ERTS / CI 2.7.2 / Vendor approval and Selection procedure Stage-I Page 17 of 18	Proposed Systems/ sub-systems shall have been in use and have established their satisfactory performance and reliability on at least One mass rapid transit systems (including Railway or Airports) in revenue service over a period of Five years or more in one country outside the country of origin or in India. If required by the Engineer, Contractor shall provide certificate of satisfactory performance for a period of five years or more from the Metro operators. Where Similar System/ Sub-systems of a same of higher rating are already proven in service as per the above criteria then the supply shall be based on such sub-systems.	Supply materials with requested criteria are difficult, since many old suppliers are not manufacturing the same as on date and new suppliers are available with good quality in the market and the major supply items are separately listed in the qualification requirement, hence we kindly request you to accept the below changes for the general items: Proposed Systems/ sub-systems shall have been in use and have established their satisfactory performance and reliability on at least One mass rapid transit systems (including Railway or Airports) in revenue service over a period of Two years or more in one country outside the country of origin or in India. If required by the Engineer, Contractor shall provide certificate of satisfactory performance for a period of two years or more from the Metro operators.	Tender condition shall prevail
7.	Vol-4: ERTS / CI 2.7.2 / Vendor approval and Selection procedure Stage-II Page 18 of 18	1. DC Switch Gear: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 5 years in a Monorail/Tram/Metro Project	Bidder requests you to kindly modify the eligibility criteria as follows. 1. DC Switch Gear: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 2 years in a Monorail/Tram/ Metro Project /Any Govt Utilities The proposed modification would facilitate wider participation of experienced and proven vendors while ensuring satisfactory operational performance and reliability of the equipment.	Tender condition shall prevail
8.	Vol-4: ERTS / CI 2.7.2 / Vendor approval and Selection procedure Stage-II Page 18 of 18	2. 33kV GIS, 33kV AIS: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 5years in a Mono rail/Tram/Metro Project/TransCo/DisCom	Bidder requests you to kindly modify the eligibility criteria as follows. 2. 33kV GIS, 33kV AIS: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 2 years in a Monorail/Tram/ Metro Project / TransCo / DisCom /Any Govt Utilities The proposed modification would facilitate wider participation of experienced and proven vendors while ensuring satisfactory operational performance and reliability of the equipment.	Tender condition shall prevail
9.	Vol-4: ERTS / CI 2.7.2 / Vendor approval and Selection procedure Stage-II Page 18 of 18	5. Other equipment covered in this PS: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 5 years in a Monorail/Tram/Metro Project	Bidder requests you to kindly modify the eligibility criteria as follows. 5. Other equipment covered in this PS: Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 2 years in a Monorail /Tram / Metro Project / Any Govt Utilities The proposed modification would facilitate wider participation of experienced and proven vendors while ensuring satisfactory operational performance and reliability of the equipment.	Tender condition shall prevail
10.	Vol-2: GCC / CI 11.2.4 a) Recovery of Advances/ Page 65 of 93	The recovery of Advances shall commence when 20% of the original contract value of the work has been paid and it will be completed by the time 85% of the Contract Value has been paid or the original completion date whichever is earlier. As far as possible the recovery of advances shall be limited to 30% of an account bill.	Kindly consider the below terms for recovery of Advances for better Cash flow for the Contractor. The recovery of Advances shall commence when 25% of the original contract value of the work has been paid and it will be completed by the time 85% of the Contract Value has been paid or the original completion date whichever is earlier. As far as possible the recovery of advances shall be limited to 20% of an account bill.	Tender condition shall prevail
11.	Vol-2: GCC / CI 6.6 Facilities for Staff and Labour/ Page 47 of 93	The Contractor shall provide and maintain at his own expense, all necessary accommodation and welfare facilities as per prevailing labour & welfare laws for his (and his Sub- contractor's) staff and labour. This includes good practices like provision of temporary crèche (Bal Mandir) where 50 or more women are employed at a time. All accommodation shall be maintained in a clean and sanitary condition, by the Contractor at his own cost. Separate rest room, toilets needs to be provided for female workers.	As per this clause, Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. Kindly confirm that Necessary Space required for Contractor's Site office, Storage and Labour colony shall be provided by UPMRCL free of cost.	Tender condition shall prevail
12.	General	General	Kindly confirm whether procurement through High Sea Sales shall be permitted and accepted for this project as per the tender conditions and applicable statutory requirements.	High Seas sales will not be permitted.
13.	Vol-7: Pricing Document / CI 4 - Milestone Payment Schedule (MPS)/ Page 3 of 83	The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/Installation and Testing and Commissioning shall not be less than 15% and 10% respectively, of the price quoted in the Price of Supply.	We request you to reduce the minimum % indicated, which the prices for Cost Centres C & D is to be quoted in order to avoid the unbalanced bid, as given below. The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/Installation and Testing and Commissioning shall not be less than 10% and 5% respectively, of the price quoted in the Price of Supply.	Please refer addendum 4
14.	General	General	We understand that the stamp papers required for documents such as Bank Guarantees (BG), Contract Agreement, Indemnity Bond, and other related submissions may be procured from any state in India, and that it is not mandatory to procure the same specifically from the State of Uttar Pradesh (UP).	Ok, Agreed.
15.	Vol-2: GCC / CI 16.1 Force Majeure/ Page 66 of 72	In this Clause, "Force Majeure" means an event beyond d the control of the Employer and the Contractor, which makes it impossible or illegal for a Party to perform, including but not limited to: - Act of God; - War, hostilities (whether war be declared or not), invasion, act of foreign enemies, mobilisation, requisition, or embargo; Rebellion, revolution, insurrection, or military or usurped power, or civil war; - Contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly; - Not, commotion or disorder, unless solely restricted to employees of the Contractor or of his Sub-contractors currently or formerly engaged on the Works.	Considering the present global situation and lessons learned from recent events, we kindly request the Employer to include "epidemic" and "pandemic" under the list of events beyond the control of the Employer and the Contractor, which render the performance of contractual obligations impossible or illegal. Kindly accept and confirm the same.	Tender condition shall prevail
16.	Vol-4: ERTS / CI 14.3.8/ TEST SHEET For 33 kV/415 V Auxiliary Transformer Page 58 of 81	Table 14.12: Test Sheet for 33 kV/415 V Auxiliary Transformer as per IS 11171	As per referred clause, Short circuit withstand test of Auxiliary Transformer is mentioned as a type test. However, as per IEC-60067-5, Short circuit withstand test is a special test. In this regard, Bidder shall prove the dynamic short circuit withstand capability of the transformer by means of calculations (or) by establishing similarity as per IEC 60076-5 w.r.t the already short circuit tested transformer. Repetition of Dynamic short circuit test is not envisaged. Kindly confirm the same.	Bidder understanding is correct
17.	Vol-4: ERTS	Submission of GTP	We understand that bidder is not required to submit any GTP for any system / equipment during tendering stage. Kindly confirm our understanding.	Bidder understanding is correct
18.	Vol-4: ERTS / CI 1.4.12.2 / Page 15 of 15	The Engineer will oversee the co-ordination between LKE (02)-01 Contractor and other designated contractors. However, the Contractor will allow for liaison with any modifications to his Works to cater for the work of such other Contractors.	We understand that any such modifications shall be treated as variation and shall be covered under Price Variation. Kindly confirm our understanding.	Tender condition shall prevail

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause			Tenderer's Query	UPMRCL Reply
19.	Vol-4: ERTS / CI 1.5 / Page 15 of 15	MAKE IN INDIA Minimum Local content for the subject tender is 60% and to ensure compliance of items as listed in the Ministry of Housing and Urban Affairs order no. F. No. K 14011/10/2019 -UT-V dated 1 January, 2021. List of items is as below: i. EHV, HV, LV and Control Cables ii. EHV, HV, LV Switchgears iii. Vaccum Insulated Switchgear iv. Air Insulated Switchgear v. Battery Chargers vi. Batteries vii. Transformers viii. Fire protection System ix. Control Relay Panel x. Conductor wires			As per the referenced clause, we understand that a minimum of 60% of the total items is required to be procured from within India, specifically from the referred item list. 1. In this regard, we kindly request the following amendment: The list of items may please be deleted, and bidders may be allowed the flexibility to select items based on their own assessment and analysis. 2. Kindly provide the detailed methodology for the calculation of the 60% content requirement.	Tender condition shall prevail
20.	Vol-4: ERTS / Table 3.1.3 / Interfacing with Trackwork contractors / Page 3 of 54	Item Description Third Rail Design and Installation (Mainlines and Depots) Ballast less Track	Traction & Power supply contractor Shall arrange to procure and install third rail equipment, accessories, special tools, jigs and fixture etc. at site as per the installation drawings.	Track Contractor(s) Any change in track alignment shall be informed timely to Traction & Power supply Contractor and all traction related civil modifications works have to be executed accordingly.	We understand that, in case Traction & Power supply contractor procures the Third Rail equipment for a particular section and afterwards there is a change in track alignment of this particular section then it shall be treated under variation and contractor shall be compensated suitably. Kindly confirm our understanding.	Tender condition shall prevail
21.	Vol-4: ERTS / Table 3.1.15 / Interfacing with Power Supply Authority/ Page 52 of 54	Item Description Supply, laying, installation of 132kV Cables from PSA GSS to UPMRCL LKO RSS	LKE (02)-01 Contractor a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end. c. Shall co-ordinate with PSA for path for laying cable inside PSA GSS. d. Shall co-ordinate with PSA for deciding the location of exiting cables from PSA GSS	Power Supply Authority a. Shall provide necessary assistance for installation of cables and terminations. b. Shall allow Contractor to lay cables in the existing path wherever possible.	We understand that the 33 kV incoming cable is to be taken from GSS to RSS; however, in the referred clause, 132 kV incoming cables have been mentioned. Kindly clarify the voltage level of the incoming cable to be considered.	Please refer Addendum 2
22.	Vol-4: ERTS / Table 3.1.15 / Interfacing with Power Supply Authority/ Page 52 of 54	Item Description Protection Co-ordination	LKE (02)-01 Contractor f. Coordinate with PSA for installation of cable protection relays in PSA switchgears.	Power Supply Authority	As per the referred clause, we understand that the installation of cable protection relays in PSA switchgears to be executed by LKE (02)-01 contractors. In this regard, it is mandatory to consider the same OEM who already have supplied switchgear earlier in PSA GSS. You are requested to provide the details of existing OEM, specifications, drawings along with exact scope to be considered by LKE(02)-01 contractor.	Please refer Addendum 2
23.	Vol. 4 / ERTS / Chapter – 5 Site Facilities / page 2 of 2	The site offices shall be of suitable size of useable office area to be located as decided by the Engineer.			It has been mentioned in the referred clause that the suitable size of the usable office area shall be as decided by the Engineer. You are requested to specify the exact size requirement, as without a defined size, it will not be feasible for us to accurately assess and include the associated cost. We also understand that only a site office facility, along with furniture, is to be provided, and no vehicle or transportation facility is to be arranged for the Engineer/Employer. Kindly confirm our understanding.	Please refer tender document For transportation , please refer chapter 24 of Vol.3/ERGS
24.	Vol. 4 / ERTS / Chapter – 5 Site Facilities / Cl. 5.4 / page 2 of 2	Storage of Equipment's and Site Material			We understand that the storage of project material land / suitable space to be provided by the Employer.	Please refer tender document
25.	Vol-1: Annexure to ITT/ Annexure – 4 / Page 16 of 46	Appendix D - Proposal for Equipment / Systems			The referred Appendix has a column wherein the bidder is required to submit the Minimum Number of equipments/systems required. As this Project shall be awarded on fixed Lump Sum Price Contract basis, furnishing the quantities of the equipments/systems shall contravene the Fixed Lump sum Contract principle and would not be appropriate. We therefore request you to modify Appendix D and delete the column "Minimum Number required".	Minimum quantity/ratings of major items is already specified in the tender. Bidders may leave this column blank.
26.	Vol-4: ERTS/ Chapter 17 / Clause 17.9.2.2/ Page 16 of 31	Clause 17.9.2.2 Exposed Structural Steelwork			We would request you to kindly clarify the scope of works under the referred clause.	Please refer tender conditions
27.	Vol-4: ERTS/ Chapter 17 / Clause 17.13.10/ Page 23 of 31	Clause 17.13.10 Baseline stray current survey			We would request you to kindly elaborate Baseline stray current survey.	Please refer tender conditions
28.	Vol-4: ERTS/ CI 9.2.1 Contract Spares/ Page 3 of 14	The Contract Spares are listed in Table 9.1 below. The total quantities mentioned are provisional and bound for quantity variation and to be procured and supplied in stages or in one lot. Contractor shall submit the list for Contract Spares for Engineer's approval. Contractor shall ensure supply of spares one month prior to ROD as approved by Engineer.			We understand that the quantities defined under Table 9.1 for spares are provisional and bound for quantity variation during execution stage. However, during Bid Stage, the bidder shall provide the cost of the spares as per table 9.1 only and any positive quantity variation during execution stage shall be treated as price variation. Kindly confirm our understanding.	Please refer tender conditions
29.	Vol-4: ERTS/Chapter 2/CI 2.6.2, Page 14 of 18	"Any incidence /failure while on revenue operation affected more than 30 minutes due to the reasons attributed to Traction & Power Supply system shall invite penalty not exceeding Rs 15 lakhs. Engineer decision to impose penalty shall be final"			Before procurement of any components/equipment, Engineer approval is sought and obtained. Technical specification of major components/equipment are approved by Engineer before placement of order to the vendor. The components/Equipment are inspected at the Vendor's factory premises by the Engineer. Wherever necessary, Engineer takes approval from Employer before giving final approval to the contractor. Before commissioning of installations, Engineer inspects the installations and then only allow it for further commissioning and operation. Failure in Traction & Power supply system does not mean, the reason of failure is due to defect and deficiency in the Traction and Power supply equipment's. It may be due to failure in Rolling Stock or its operation or Failure in S&T installations or due to improper maintenance. These reasons may also lead to failure in Traction and Power supply system. Therefore we kindly requesting you to delete this clause.	Please refer tender conditions
30.	Vol-4: ERTS/ CI 16.3.7.2 Third Rail-Ramps/ Page 25 of 33	Third Rail – Ramps The Contractor shall propose their research and development proposals as part of their tender submissions.			This tender clause states that "The contractor shall propose their research and development proposals as part their tender submissions". Kindly define what kind of research and development activity is expected to be carried out by construction contractor.	Please refer tender conditions
31.	Vol-4: ERTS/CI 16.2.1.7/ Page 4 of 33	Third Rail System Specifications LKE(02)-01 Contractor shall submit the feasibility report before procurement of third rail components which includes detailed study of alignment with the third rail, crossovers, curves, gap study, interfaces, depot and mainline separation etc., for mainline and depot.			The tender clause requires to submit feasibility report before procurement of third rail components. The word "feasibility report" may be replaced with "design report".	Please refer tender conditions
32.	Vol 3: ERGS/ CI 1.12 Climatic Conditions, Page No. 7 of 12	Climatic Conditions			For the estimation of the Bill of Quantity of 3rd rail components it is mandatory to calculate the number of expansion joints based on the distance between expansion joints. The distance is subject to the temperature range at the place of installation. Whereas for outdoor installation the temperature range is provided in GS 1.12 "Climatic conditions", the same is missing for the tunnel. Kindly provide the minimum and maximum temperature for tunnel installation.	Please refer tender conditions
33.	Vol-7: Pricing Document / CI 8a - Price Variation in Conductor Rail / Page 3 of 83	Price Variation in Conductor Rail			The provided formula is floating the conductor rail price using the spot rate of aluminium quoted at London Metal Exchange (LME) which is correct. But the spot rate of aluminium in reality only impacts the mass of aluminium that is used to produce the rail. The formula considers that 75% of the rail price is variable following the aluminium spot rate and do not consider that the spot rate will only impact the costs of the mass of aluminium used for the production of the rail and this part of costs compared to the overall costs of the rail is much lower than 75% of the rail price. The more appropriate LME adjustment for the conductor rail is to apply the variation in LME only on the real mass of aluminium used for the production of the rail and not on the other costs factors that belong to the production of the rail. Therefore, we request you to change the price variation accordingly: Price Variation for Conductor Rail The price adjustment shall be linked to spot rate of aluminium quoted at London Metal Exchange (LME), and shall be as under: P1= P0 + M x (LME1 – LME0) M= Mass of aluminium per meter of conductor rail Po= Base price (Contract price) of the Conductor rail (EUR per meter) P1= Calculated new price of the Conductor Rail based on the new LME (EUR per meter) LME0= LME rate (EUR/tonne) 28 days prior to tender submission date LME1 = LME rate (EUR/tonne) 28 days prior to notification for inspection Therefore, we request you to kindly consider and change formula accordingly.	Please refer tender conditions
34.	Vol 4: ERTS/ chapter-11 -132kV cable works/ clause no. 11.16.2.7/ Pg no 226 of 830	--			We understand that, the road restoration work, ROW & approval from concerned govt authority (i.e: NHAI/UPPWD/ NH-PWD) for cable laying work is not in bidders scope. The same shall be under the scope of UPMRCL. Kindly confirm our understanding.	chapter 11 of volume 4(ERTS) has been deleted
35.	Vol 4: ERTS/CHAPTER – 12 / clause no. 12.16.1/ Pg no 77 of 88	The grade of concrete should be as per approved design but not inferior than M-25 as per IS 456 for all civil construction in RSS.			We understand that M Sand can be used for concreting, other civil works & Cable laying work for the proposed RSS. Kindly confirm our understanding.	Please refer tender conditions
36.	Vol 4: ERTS / ,Page no. 6 of 88 , Clause no. 15.3.3.1, Table 15.1	System Voltage			Although rated insulation voltage/highest non-permanent voltage is mentioned, we understand that the service voltage for the DCHSCB is 750VDC. Kindly confirm our understanding.	Please refer tender conditions
37.	Vol. 4 : ERTS / 15.5.4.8 Page 39 of 88	Nuts & Bolts			We understand that all Nut & Bolts, Hardware shall be of SS304 (Stainless Steel). Kindly confirm our understanding.	Please refer tender conditions
38.	Vol. 4 : ERTS / 15.5.6 Page 30 of 88	All routine tests like separate source voltage withstand test, winding resistance measure, transformation ratio measure, no-load loss, current measure and coupling checking as per IEC 60076, IEC 60146 and EN 50329 are to be conducted on each transformer in presence of Engineer.			All routine test as per IEC60076-11 shall be conducted on the transformer. Coupling checking test of transformer may be allowed on the 1st unit only as a type test as per clause 15.5.8. Kindly accept & confirm the same.	Please refer tender conditions

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
39.	Table 15.8: Rectifier Transformer Rating: 15.5.6.3	All routine tests like separate source voltage withstand test, winding resistance measure, transformation ratio measure, no-load loss, current measure and coupling checking as per IEC 60076, IEC 60146 and EN 50329 are to be conducted on each transformer in presence of Engineer.	All routine test as per IEC60076-11 will be conducted on the transformer. Coupling checking test of transformer will be conducted only on the 1st unit only as a type test as per clause 15.5.8. Kindly confirm.	Please refer reply of s.no.38 as above
40.	Vol. 4 : ERTS / 15.5.6 Page 40 of 88	Test on insulation: The test consists of applying DC high voltage (2500 V or 5000 V) with the help of a motor driven megger, continuously between winding and earth, and measure insulation resistance at the end of 10 second and 60 seconds. The polarization ratios R60/R10 and R600/R60 should not be less than 1.4 and 1.2 respectively. (R10 R60 and R600 are the insulation resistance values after 10 seconds, 60 seconds and 600 seconds respectively).	We understand that this test is not applicable for Dry type Transformer. Kindly confirm our understanding.	tender conditions shall prevail.
41.	General	Switching Transient Protection	We recommend having Ph-Ph & Ph-E Surge Arrestors or Transient Voltage Protection (TVP) installed in the transformer in line with the Agra Metro. Kindly accept & confirm the same.	tender conditions shall prevail.
42.	Change of Law		Request you to include following condition in the contract. "The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract."	Tender conditions shall prevail. Refer Clause No. 11.1.4 of Vol. 2 GCC
43.	Volume: 5, ASS room layout/ ASS+ TSS layout (Drg. No. AGCC01-11718A-TDR-BSI-TR-PWR-72014) Vol-7: Pricing Document / Cl 8 (d) - Price Variation / Page 4 of 83	Note: 7. ASS or ASS-Cum-TSS Location (Concourse / Platform / At Grade) May Change as per actual site conditions. Contractor have to bear all such cost arising due to this change at any stage of the Project. Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis: (i) Addition/Deletion of Stations (ii) Increase/ Decrease in the length of the corridors (iii) Change in quantity of Inverters, Inverters Transformer along with associated Switchgears (iv) Change in the location of RSS/AMS	As per tender drawings, location of substations may change, and cost is to be borne by contractor. The Bidder understands that this is not reasonable commercial risk allocation and may substantially impact the design, cable routing, quantities, installation methodology, and overall project cost. The Bidder kindly requests the Employer to confirm that any change in the location of substations from the tendered drawings/basis shall be treated as a Variation, with corresponding adjustment in cost and time, as applicable.	Tender conditions shall prevail.
44.	Vol-4/ERTS/Cl. 1.4.3.1 page 8 of 15 Vol-4/ERTS/Cl. 2.5.7 page 11 of 18	The bulk power is planned from Uttar Pradesh Power Transmission Corporation Limited, the power supply authority, ("UPPTCL") grid substations (GSS) through 33kV double cable feeders (three core Al conductor XLPE cables) at One (1) Receiving Substation (RSS)/Auxiliary Main Substation (AMS) of UPMRCL for East West Corridor. 33 KV cables and accessories - 1R, 3X1C/300Sq.mm XLPE, Aluminum Cable Incoming feeder described as 3-core cables vs design requirement as 1C cables	Kindly clarify whether incoming feeders are 3-core XLPE or 3×1C XLPE cables. Contradiction impacts design, laying & costing. Also, the clarity on scope of incoming cable as the same is not defied in under cope of work for contractor.	Please refer Addendum 2
45.	Volume 4 : Chapter 3 Interfaces General	Multiple interface dependencies (track, E&M, viaduct)	The Bidder kindly requests the Employer to provide coordinated interface drawings covering Civil, Track, and E&M systems to avoid design conflicts, interface mismatches, and rework during execution.	It's responsibility of traction contractor to interface & prepare drawings during Detailed design stage.
46.	Volume : 4, clause no. 1.1.6 Page no. 04 of 15	If the Tenderer considers any additional equipment, equipment of higher capacities and higher ratings for the systems and sub-systems or any other additions necessary for the complete, safe and reliable operable power supply system, he shall include such items in his Tender, as additional items, providing all clarifications and justifications for the same.	It is understood from the tender documents that the Employer has provided preliminary design and tender drawings, while the responsibility for verification, adequacy, and preparation of final detailed design rests with the Contractor. In this regard, kindly clarify whether any deviation from the tender drawings/designs arising during detailed engineering, interface constraints or optimization, shall be treated as a Variation and compensated accordingly, including associated cost and time implications.	Tender condition shall prevail
47.	Volume 4/ ERTS/ Chapter –2: Scope of Work/ Clause 2.5.3/ Page no 07 of 18	East – West Corridor interlinked with North – South: - Only one RSS/AMS shall be constructed at Vasantkunj Depot, and special arrangement shall be made at Charbagh Interchange Station of North – South Corridor to extend feed to East – West Corridor in case of emergency. The sizing of the RSS/AMS shall be designed so that the complete loss of any one of the two existing RSSs (TPNR RSS and Munshipulia RSS) does not affect normal operation across the entire system. The RSS shall be designed to take the 100% Traction and Auxiliary Power supply load of East West Corridor for design year also taking into consideration its future extensions	It is understood that only one RSS/AMS has been proposed for the corridor, while the redundancy philosophy is based on interconnection with existing North-South RSSs. In this regard, the Bidder kindly requests the Employer to clarify the following: 1. Exact scope and responsibility of interconnection with the existing North-South RSSs, including associated modifications/upgrades required in the existing system. 2. Availability of data and operation condition of existing system, required for design of the proposed system considering the scenarios defined in the tender. 3. Clarification regarding the design basis, as one clause specifies that the RSS shall be designed considering 100% load of the East-West corridor, whereas no corresponding requirement or loading consideration has been mentioned for the North-South corridor and interconnected RSS network.	Tender condition shall prevail Please refer addendum 2
48.	Volume 5: General	List of drawing.	Certain key design inputs, such as RSS layout drawings, earthing layout drawings, and depot cable routing drawings, have not been provided in the tender documents. The Bidder kindly requests the Employer to provide complete GAD/layout drawings and related interface details to enable accurate estimation, detailed engineering, cable quantity assessment, and proper understanding of the project scope.	Please refer Addendum 2 & 4
49.	Volume 4/ ERTS / chapter 3 / clause 3.1.11 / page no. 40 of 54	Interface with rolling stock contractor	The tender requires the Bidder to validate the sizing/rating specified in the tender documents through a Simulation Study. However, all the necessary input data required for carrying out such simulation is presently not available in the tender documents. In order to perform an accurate and compliant simulation study, the Bidder kindly requests the Employer to provide, at minimum, the following input parameters/details: a) Auxiliary Power of the Rolling Stock b) Tractive Effort vs. Speed Curve c) Braking Effort vs. Speed Curve d) Line Current Limitation Data (Regulation as per EN-50388) e) Minimum and Maximum Voltage limits of the Rolling Stock f) Car Weight, train Length, rolling stock Configuration g) No. of car and Current collector shoe arrangement. h) Primary suspension dynamic downward movement from nominal position for various loading condition. i) Maximum lateral position of Current collector shoe.	Please follow tender conditions Necessary Data regarding Rolling Stock shall be shared during detailed design stage.
50.	Volume 4 / ERTS / Chapter –2: Scope of Work/ Clause 2.5.9 / page no. 11 of 18	Integration & Up-gradation of existing SCADA System (Make-ABB) installed at BCC server room, TPNR RSS & MSPA RSS of Lucknow Metro shall be in accordance to Chapter 18 (I) & (II) of this TS.	It is observed that detailed system architecture, interface protocol mapping, and existing SCADA configuration details have not been provided in the tender documents. To enable proper system engineering, interface assessment, and integration planning, the Bidder kindly requests the Employer to provide complete. SCADA integration documents, including but not limited to the following: □ Existing SCADA system architecture □ RTU interface details □ Communication protocol details and mapping □ Interface philosophy and data exchange requirements	Please refer Addendum 4
51.	Volume 4/ ERTS / Chapter 3 General	General	The tender defines the responsibility of coordination with multiple contractors/agencies. However, the scope demarcation, interface boundaries, and deliverables among various contractors do not appear to be clearly frozen in the tender documents. In this regard, the Bidder kindly requests the Employer to confirm that any delay, non-performance, interface issue, or dependency attributable to other contractors/agencies shall not adversely affect the Contractor's obligations under this Contract and that any resultant impact on schedule shall be treated as an excusable delay, with corresponding extension of time, as applicable.	Tender condition shall prevail (Refer GCC Clause No. 8.4)
52.	Volume 4 / Chapter 3 – Interfaces / clause no. 3.1.7 page no. 21 of 54	Interface with station E&M service contractor	It is understood that earthing design is under the scope of the LKE Contractor, while execution is under the E&M Contractor. Kindly clarify the responsibility for compliance, testing, and performance of the earthing system. Further, kindly confirm that any mismatch or modification arising due to interface issues shall be treated as an Interface Variation with applicable cost and time implications.	The Traction contractor shall have to close interface with E&M Contractor to ensure quality and safety of earthing system at own cost.
53.	Volume 4 / Chapter 19 – RAMS requirement / clause no. 19.9 / page 10 of 19	The complete traction power supply system including the dc third rail system shall be designed to meet 99.95% service availability within 1 (one) year of ROD.	The specified system availability requirement of 99.95% necessitates clearly defined system boundaries and interface responsibilities. In this regard, kindly clarify and confirm the exclusions applicable for failures or outages attributable to external agencies/interfaces, including but not limited to Grid Supply, Signalling, Telecom, Civil works, and other interfacing systems not under the Contractor's direct scope.	Tender condition shall prevail
54.	Volume 4 / ERTS / Chapter 3 - Interfaces / clause no. 3.1.7 page no. 21 of 54	Interface with station E&M service contractor	The Bidder understands that the scope of Contractor LKE 02-01 is limited up to supply and execution of the Auxiliary Transformer, and that thereafter the supply of cables and LV Panels shall be under the scope of the E&M Contractor.	Tender condition shall prevail
55.	Volume 4 / ERTS / Clause no. 13.2.1.2 - 33kV Cable Works / page no. 04 of 26	In addition to 33kV cables, armoured Optic Fibre Cables (OFC) of suitable sizes shall be provided for cable differential protection and interlockings. Also, control cables of suitable sizes are laid for various interlocking alongside 33kV cables in different bracket / supports. These control cables shall be FRLS for elevated and at-grade / depot sections and FRLSOH for tunnel/underground sections. Separate control cables for traction and auxiliary networks shall be used. The Contractor shall submit detailed proposal including technical particulars of these control cables to the Engineer for approval.	The Bidder kindly requests confirmation regarding the fibre network requirement for the cable communication network. It is understood that spare fibres from the OFC network provided by the Telecom Contractor may be utilized for this purpose. Kindly confirm whether usage of spare fibres from the existing/proposed Telecom OFC network shall be acceptable, or if dedicated fibres are required to be provided along the route under the present scope.	Please follow tender conditions(Annexure 25 of Addendum 2)
56.	Vol 4: ERTS / Clause no. 2.5.7 / Page no. 10 of 18	In MV circuits having more than one cable per phase, it should be possible to isolate only the faulty cable and thereafter it shall be feasible to re-energize the affected MV circuit with the balance healthy cables.	To implement the referred design requirement, kindly confirm if any MV cable isolation device is required to be provided in the cable compartment of 33kV switchgear. Also kindly confirm the possibility of re-energization, if any since reduction in number of runs per phase will reduce the current carrying capacity of the circuits.	Tender condition shall prevail
57.	Volume 5 : List of drawing	Sectioning diagram for Vasantkunj depot & Main Lines	The Bidder kindly requests the Employer to provide the following drawings/documents for proper system understanding and engineering: 1. Sectioning Scheme/Diagram for the Main Line from Charbagh to Vasantkunj. 2. Sectioning Scheme/Diagram for the Vasantkunj Depot.	Please refer Addendum 2

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply												
58.	Vol4_ERTS / Chapter 1: Introduction and Project Overview / clause no. 1.2.2 / page 6 of 15	The details of Lucknow Metro East West Corridor is as under:	The Bidder kindly requests the Employer to clarify and provide the transition chainage/location between the Underground and Elevated sections of the corridor.	Please refer Addendum 2												
59.	Volume 5 : List of drawing	Track alignment drawings	The Bidder kindly requests the Employer to provide Track Alignment Drawings for both the Main Line and Depot for estimation and design of the Third Rail equipment.Additionally, kindly provide the Track Alignment Drawings for the connecting lines from Vasantkunj Main Line Station to Vasantkunj Depot, required for estimation and engineering of the Third Rail system.	Please refer Addendum 2												
60.	Vol4_ERTS / Chapter 16: Third Rail System / Clause no. 16.2.2.6 / page 6 of 33 Vol5_Tender_Drawings (Drawing No. AGCC01-11718A-TDR-EST-TR-PWR-71512),	Distance between Centre line of the Conductor rail and track centre 1485 mm	It is observed that the conductor rail horizontal distance from the track center is specified differently in the tender documents: □ In Vol4_ERTS, Chapter 16: Third Rail System, the distance is specified as 1485 mm from track center. □ However, in Vol5_Tender_Drawings (Drawing No. AGCC01-11718A-TDR-EST-TR-PWR- 71512), the corresponding distance is indicated as 1380 mm. Kindly clarify and confirm the correct horizontal distance to be adopted for design and estimation purposes.	Please refer Addendum 2												
61.	Vol4_ERTS / Chapter 16: Third Rail System / clause no. 16.2.2.6 / page 6 of 33 Vol5_Tender_Drawings (Drawing No. AGCC01-11718A-TDR-EST-TR-PWR-71512)	Height of Current collecting surface of the conductor rail from rail level 148 mm nominal	It is observed that the vertical distance of the bottom surface of the conductor rail from the running rail top surface is specified differently in the tender documents: In Vol4_ERTS, Chapter 16: Third Rail System, the dimension is specified as 148 mm above the running rail top surface. However, in Vol5_Tender_Drawings (Drawing No. AGCC01-11718A-TDR-EST-TR-PWR-71512), the corresponding value is indicated as 164 mm. Kindly clarify and confirm the correct vertical dimension to be adopted for design and estimation purposes.	Please refer Addendum 2												
62.	Vol4_ERTS / Chapter 18 / Clause 18.5.6.1, Page 19 of 116.	The Electric power is supplied to the rolling stock by means of a conductor Rail known as third Rail. The conductor Rail shall be installed on trackside at the specified distance to the track centreline / top of the Rails. In the double-track line, the conductor Rail shall be installed between both tracks in order to leave sufficient space between for walkways. In stations, it is necessary for safety reasons to install the conductor rail on the side of the track opposite to platform edge.	The tender clause specifies that the conductor rails at stations shall be installed between both tracks. However, for sections other than station areas, it is understood that the conductor rail is to be installed outside the track. Kindly confirm whether this interpretation is correct.	Tender condition shall prevail												
63.	Vol4_ERTS / Chapter 16: Third Rail System / clause no. 16.1.3.1 / page no. 03 of 33	In the main workshop areas, for the purpose of safety of working personnel, a system called stinger system shall be installed. The conductor rails shall be installed on the gantry of the buildings and vehicles are powered through flexible cables.	Kindly clarify the requirements for the Stinger System, including the number of stabling lines and their respective lengths to be considered for design, estimation, and sizing of the system.	Please refer Addendum 2												
64.	Vol4_ERTS /Chapter 2 / clause 2.5.6 / page 09 of 18	Rails of Main line, Depot to be kept at floating voltages excluding the following area: Inspection Bay Line (IBL) area Washing Bay Line (WBL) Pit Wheel Line (PWL)	Kindly provide the required length/dimensions of the Automatic Coach Washing Plant to be considered for design and layout planning.	Dimension of Automatic coaching Plant to be considered suitable for 3 car train												
65.	Volume 4/ ERTS /Chapter 1 / Clause 1.4.4.4 / page 08 of 15	East – West Corridor interlinked with North – South: - Only one RSS/AMS shall be constructed at Vasantkunj Depot, and special arrangement shall be made at Charbagh Interchange Station of North – South Corridor to extend feed to East – West Corridor in case of emergency. The sizing of the RSS/AMS shall be designed so that the complete loss of any one of the two existing RSSs (TPNR) RSS and Munshipulia RSS) does not affect normal operation across the entire system.	With reference to the "Special Arrangement" mentioned in the tender documents, the Bidder understands that the scope is limited to cable connection with the spare feeder available in the existing system, along with necessary modification in the protection scheme/settings of the switchgear. The Bidder further understands that no physical modification/replacement of the existing switchgear and no capacity augmentation of the existing corridor/system are envisaged under the present scope.	Bidder understanding is correct												
66.	Volume 4 / ERTS / chapter 9 / Table 9.2 / page 09 of 14	Table 9.2: Special Tools, Equipment and Instruments <table><tr><th>Sl no.</th><th>DESCRIPTION</th><th>Unit</th><th>Quantity</th></tr><tr><td>A</td><td>Machinery and Plant</td><td></td><td></td></tr><tr><td>1.</td><td>Oil Filtration Plant (8000 liters capacity) (working off 415V, 3-phase AC)</td><td>nos.</td><td>1</td></tr></table>	Sl no.	DESCRIPTION	Unit	Quantity	A	Machinery and Plant			1.	Oil Filtration Plant (8000 liters capacity) (working off 415V, 3-phase AC)	nos.	1	The Bidder seeks clarification regarding the requirement of an Oil Filtration System, as all the transformers specified under the present scope are understood to be Dry Type Transformers. In view of the above, kindly confirm whether the Oil Filtration System is required under the scope of this Contract.	Tender condition shall prevail
Sl no.	DESCRIPTION	Unit	Quantity													
A	Machinery and Plant															
1.	Oil Filtration Plant (8000 liters capacity) (working off 415V, 3-phase AC)	nos.	1													
67.	Volume 4 / Chapter 3 / Table 3.1.15 / page 52of 54	3 Protection Co-ordination LKE 02-01 contractor: Coordinate with PSA for installation of cable protection relays in PSA switchgears. PSA: Shall provide and install the protection relays at UPPTCL GSS.	Kindly clarify the exact scope distribution for cable protection relays at PSA (GSS) end, specifically: 1. Whether design, supply, and installation of cable protection relays at PSA GSS is fully under PSA scope, 2. Or whether LKE (02-01) Contractor is required to: o Supply relays and/or associated panels o Assist in integration but not supply hardware 3. Clarify interpretation of the clause: "Coordinate with PSA for installation of cable protection relays in PSA switchgears" – Whether this implies coordination only or partial execution responsibility.	Please refer Addendum 2												
68.	Volume: 4 clause 12.1.1.4.1(page 4 of 88) & 14.2.2.5 (page 07 of 81)	12.1.1.4.1: The RSS room shall have two incoming 33 kV bays, four outgoing feeder bays (1 for each circuit of ring main (with Line PT).& 1 for each circuit for Depot ASS/TSS (with Line PT)) and two bus PT and two identical spare outgoing feeder along with space provision for two additional feeder and one bus coupling bay 14.2.2.5: The contractor shall take into consideration for providing two additional 33kV spare switchgears at each end station (Charbagh and Vasantkunj) & RSS/AMS of East West corridor (total Six (2+2+2) numbers of CBs) and it shall be included in the cost of the tender.	Query: Clause 12.1.1.4.1 specifies provision of two identical spare outgoing feeder bays in the 33 kV RSS switchgear. Clause 14.2.2.5 further mentions provision of two additional 33 kV spare switchgears at RSS. Bidder understands that the spare feeders referred to in both clauses correspond to the same requirement and that only two spare feeder bays in RSS are to be considered under the scope of 33 kV switchgear. Kindly confirm whether the above understanding is correct.	Please refer Addendum 2(Tender Drawings) Tender conditions shall prevail.												
69.	Volume : 4 clause 12.1.1.4.1(page 4 of 88) & 12.1.1.14 (page 5 of 88)	12.1.1.4.1: The RSS room shall have two incoming 33 kV bays, four outgoing feeder bays (1 for each circuit of ring main (with Line PT).& 1 for each circuit for Depot ASS/TSS (with Line PT)) and two bus PT and two identical spare outgoing feeder along with space provision for two additional feeder and one bus coupling bay 12.1.1.14 : Space provision for spare bay for 33 kV AIS shall be considered.	Clause 12.1.1.4.1 specifies provision of space for two additional feeder bays and one bus coupler bay, whereas Clause 12.1.1.14 broadly states that space provision for spare bays for 33 kV AIS shall be considered. In this regard, bidder seeks the following clarifications: 1. Whether the space provision for future feeder bays (two nos.) is required to be: o on a single side, or o distributed on either 2. It is understood that the bus coupler bay is part of the base design and will be provided as an installed panel, and therefore no separate space provision is required for bus coupler under future expansion. 3. Accordingly, bidder understands that space provision is required only for two additional feeder bays, and not for the bus coupler bay. Kindly confirm the above understanding and specify the intended arrangement for space planning of spare bays. side of the switchgear lineup.	Please refer Addendum 2(Tender Drawings) Tender conditions shall prevail.												
70.	Volume 5 : Power feeding diagram (Drawing number 71551) and 33KV SLD & protection scheme for vasantkunj RSS (Drg. No 71569)	Power feeding diagram 33KV SLD & protection scheme for Vasantkunj RSS	In the Power Feeding Diagram (Drg. No. 71551), feeders are shown from RSS to Vasant Kunj ASS, whereas in the 33 kV SLD & Protection Scheme (Drg. No. 71569), only depot feeders are represented. Bidder understands that the feeder arrangement indicated in the Power Feeding Diagram reflects the actual system requirement and that the protection scheme drawing may be indicative in nature. Kindly confirm whether the feeder configuration as shown in the Power Feeding Diagram shall be considered as the final requirement for design and execution.	Please refer Addendum 2												
71.	Volume 5 : 33KV SLD & protection scheme for vasantkunj RSS (Drg. No 71569)	33KV SLD & protection scheme for vasantkunj RSS	The incoming and outgoing cable sizes indicated in the 33 kV SLD & Protection Scheme for Vasant Kunj RSS (Drg. No. 71569) are not aligned with the cable sizes specified in Table 13.3 and Table 13.5 of the technical specifications. Kindly confirm which reference (SLD drawing or specification tables) shall prevail for minimum cable sizing, for the purpose of design and BOQ.	Please refer Addendum 2												
72.	Clause 11.1.4 of Vol 2 / Page 63 of 93	Change in Taxes/Duties: - a) "Change in Taxes/Duties/Levies" means the occurrence or coming into force of the following, at any time after the date of submission of tender. (i) Any new tax which is imposed on Composite Works Contracts applicable on Metro Project. (ii) Change in the rate of Good and Services Tax (GST) on Composite Works Contracts applicable on Metro Project as per GST Act. b) The Contract Price shall be adjusted due to the above condition. Adjustment in Contract Price will be applicable up to the stipulated date of completion of the Work including the extended period of completion where such extension has been granted c) If the extension of contract period is on account of contractor's fault, no compensation shall be made towards upward revision towards "Changes in Taxes and Duty" as mentioned at Sl. No. (a) (ii) above. Any benefit on account of downward revision towards "Changes in Taxes and Duty" as mentioned at Sl. No. (a) (ii) above, during the original contract period or extended contract period shall be on employer's account. d) Any other changes (except on account of Clause (a) (i) above) in existing taxes/ new taxes on supply of materials/ services/ works etc. will not be considered and its impact shall be considered covered in the Price Variation Clause provided in the Contract and in Contract where Price Variation Clause is not provided, the impact on any other change (except on account of Clause (a) (i) above) in existing taxes/ new taxes on supply of materials/ services/ works etc. will be deemed to be included in the quoted contract price e) Also, the Contract price shall not be adjusted on account of fluctuations in the rates of exchange between the foreign currencies of the Contract and Indian Rupees from the last date of submission of tender.	1.Whether additional costs (particularly, in case of change in rates of Excise Duty, VAT, other cesses, etc. on fuel) incurred on account of increase in rate of taxes on fuel would be reimbursed by the employer? 2.Restrictions in ITC - A clarification should also be sought on whether the contractor can claim reimbursement of GST cost on account of restrictions that may be imposed on input tax credit on procurements made by the contractor in future.	Tender conditions shall prevail												

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer’s Query	UPMRCL Reply
73.	Clause 11.1.1 of Vol 2 / Page 62 of 93	(b) Goods and Services Tax (GST) is excluded in the contract price. The contractor shall maintain details of GST paid to concerned department and the same shall be reimbursed by employer based on submission of: (i) Monthly Return of GST (GSTR-3B) of the contractor for the relevant period/periods along with detailed statement (GSTR 1 & GSTR 2) and copy of challans in regard to deposit of taxes for Employer project. (ii) Certificate of the Chartered Accountant in regard to turnover of the contractor relating to Employer project and GST paid/adjusted through Input Tax Credit.	In this regard, clarification is sought on the following: 1. Whether GST reimbursement shall be made only after submission and verification of all required documents, including GST returns, payment challans, and Chartered Accountant certificate. 2. Whether such compliance is required for each individual tax invoice, or whether GST reimbursement will be considered on a periodic basis (monthly/return period basis). 3. Whether any interim reimbursement of GST is permissible prior to submission of the CA certificate, or reimbursement shall be processed strictly post submission of all stipulated documents.	Please refer tender conditions
74.	Clause 6.4 of Vol 2 / Page 45 of 93	Labour Laws: - g) The Contractor shall ensure the registration of all his eligible workers inclusive of Sub-contractor and Petty Contractors with BOCW (Building and Other Construction Workers) Board. Any liabilities on account of BOCW at any stage shall be on part of tenderer and the quoted price shall be inclusive of BOCW charges. The Employer shall make the deduction accordingly and deposit the amount to the concerned authorities.	We understand that BOCW is not applicable on GST portion. Kindly confirm our understanding.	Please refer Addendum 4
75.	Clause 11.2.1 of Vol 2 / Page 64 of 93	Mobilisation Advance: - a) Mobilisation Advance shall be generally limited to 5% of Original Contract Value payable in two equal instalments or as mentioned in the Special Conditions of Contract. The first instalment shall be paid after mobilisation has started and next instalment shall be paid after satisfactory utilization of earlier instalment by giving all necessary details to the satisfaction of Engineer duly certified by the Chartered Accountant	Kindly clarify whether GST portion on the advance payments will also be reimbursed by the employer at the time of advance payment?	Please refer Addendum 2
76.	Clause 2.6 of Vol 1 / Page 13 of 27 & Clause 2.3 of Vol 2 / Page 15 of 93	The tenderers must note the following: - UPMRC project is covered under Project Import 98.01 of Custom Tariff Act according to which only concessional custom duty is payable. The tenderer should avail this benefit. As regards registration under Project Import, after the award of the contract, UPMRC at the written request of a contractor shall facilitate the contractor for getting themselves registered for availing Project Import benefits. The responsibility to avail the concessional benefits under Project Import shall solely rest with the contractor. Permits, Licences or Approvals: - It shall be Contractor’s exclusive responsibility to get approvals, permits or license required for the Contract. However, the Employer may (where he is in a position to do so) provide reasonable assistance to Contractor at the request and cost of the Contractor in getting Permits, License or Approvals required during the Contract. The rendering of such assistance by the Employer shall not be interpreted as a pretext by the Contractor as condoning of any delay or non-performance of any of the Contractor’s obligations. The following-up of all such applications shall be the responsibility of the Contractor.	As per the list of Sponsoring Authorities specified under the Project Import Regulations, 1986, the designated Sponsoring Authority for the “Lucknow Metro Rail Project” is stated as follows: “Managing Director or Director (Rolling Stock and Systems), Lucknow Metro Rail Corporation (LMRC), Administrative Building, Near Dr. Bhimrao Ambedkar Samajik Parivartan Sthal, Vipin Khand, Gomti Nagar, Lucknow – 226010.” In view of the above, it is requested to confirm whether the Employer shall arrange for the issuance and provision of the Sponsorship Letter for Project Import from the aforesaid Sponsoring Authority.	Tender condition shall prevail
77.	Vol-2: GCC / CI 2.3 Permits, Licences or Approvals/ Page 15 of 9 3	Permits, Licences or Approvals It shall be Contractor’s exclusive responsibility to get approvals, permits or license required for the Contract. However, the Employer may (where he is in a position to do so) provide reasonable assistance to Contractor at the request and cost of the Contractor in getting Permits, License or Approvals required during the Contract.	As per tender document, it shall be Contractor’s exclusive responsibility to get approvals, permits or license required for the Contract. We presume that our scope is limited to getting approval from EIG and necessary labour licence only. Kindly confirm our understanding.	Tender condition shall prevail
78.	Vol-2: GCC / CI 1.4 Contract Agreement/ Page 12 of 93	The Employer and the Contractor shall execute a Contract Agreement as per format given in Annexure of Instructions to Tenderer (ITT), within 30 days after receipt of confirmation of BG from Bank with such modifications as may be necessary to record the Contract. The Contract Agreement shall be based on the form as included in Tender document. The costs of stamp duties and similar charges imposed by law shall be borne by the Contractor.	With reference to the tender clause regarding execution of the Contract Agreement, it is understood that the costs towards stamp duties and similar statutory charges shall be borne by the Contractor. In this regard, kindly confirm the applicable value/rate of stamp duty charges to be considered for execution of the Contract Agreement for this project.	Contractor may submit based on the provisions of the relevant statute & Stamp Act .
79.	Volume-1/NIT / Annexure 2A	Affidavit for Unaudited Balance Sheet	In the mentioned format, it is stated that the affidavit is to be submitted in case the Balance Sheet for FY 2024-25 has not been audited. However, considering the current tender submission period, the latest financial year for which the audit may still be pending would be FY 2025-26. Therefore, it appears that the reference to FY 2024-25 may be inadvertent. Kindly clarify whether the affidavit requirement is intended to apply to the unaudited Balance Sheet for FY 2025-26 instead of FY 2024-25.	Please refer Addendum 4
80.	Vol-1: NIT / Annexure - 7/Historical Contract Non-Performance /Page 34 of 37	History of Non-Performing Contracts • Contract non-performance did not occur during the last two years specified in Clause-1.1.4.1 (x), Pre-qualification Criteria. • Contract(s) not performed during the last two years specified in Clause-1.1.4.1 (x), Pre-qualification Criteria.	In Annexure 7 of NIT, which pertains to contracts not performed during the last two years, the reference is made to Clause 1.1.4.1 (x) of the Pre-Qualification Criteria. However, upon review of the tender document, Clause 1.1.4.1 (x) is not available/not found in qualification criteria of NIT. We kindly request you provide the correct reference clause corresponding to the requirement mentioned in Annexure 7.	Please refer 1.4.1 (iv) of NIT in this regard
81.	Vol-1: NIT / ITT Clause C.13: Contractor’s Machinery/ Page 15 of 27	Contractor’s Machinery The Tenderer shall submit with his Tender a schedule of the main items of machinery which he intends to use for carrying out the works, indicating the activities for which each item will be used.	Contractor’s Machinery Tenderer is required to submit the details of the machineries to be deployed, as per the list specified in Annexure -3: Proposal for Construction Machinery. However, no specific format or template has been provided in the tender document for furnishing these details. Kindly confirm if the bidder may submit the details in a self-prepared format or if any prescribed format is available for submission.	please refer tender documents
82.	Volume -1/ITT /A.1 General Description of the Work/ Page 4 of 27 V olume - 4/ERTS/ Chapter –2: Scope of Work/ clause 2.1.1 / Page 2 of 18	A.1 General Description of the Work : Length of Underground Section – 6.879 KM Length of Elevated Section – 4.286 KM 2.1. Overview of the Project Thakurganj(inc) to Vasantkunj (inc) – 3.77 KM Charbagh(inc) to Thakurganj(excl) – 7.39 KM	It is observed that there appears to be a discrepancy in the corridor lengths specified in the tender documents. Further, the section-wise distribution between Underground and Elevated portions cannot be clearly established from the above information. Kindly clarify and confirm the correct corridor lengths, along with the chainages defining the Underground and Elevated sections, for design and estimation purposes.	Please refer Addendum 2
83.	Volume 4 / ERTS / Chapter – 1: I ntroduction and Project Overview /	1.4.3 INCOMING 33 kV SUPPLY 1.4.4 RECEIVING SUBSTATION/AUXILIARY MAIN SUBSTATION	The Bidder understands that the incoming 33 kV power supply for the RSS shall be provided by UPPTCL from Hardoi Road GSS and Jehta GSS up to the Vasantkunj RSS, and that the Contractor’s scope is limited to providing the necessary arrangements and equipment within the Vasantkunj RSS premises only. Therefore, any references in the tender documents indicating supply and/or laying of 33 kV cables from GSS to RSS by the Contractor may be treated as not applicable, and the relevant clause(s) may be updated accordingly. Kindly confirm.	Please refer Addendum 2
84.	clause 1.4.3 & 1.4.4 / Page 8 of 15 Volume 4 / ERTS / Chapter – 3: Interfaces / clause 3.1.16 / Page 51 of 54	3.1.16 INTERFACE WITH POWER SUPPLY AUTHORITIES Power Supply required for Traction and Auxiliary purposes will be obtained from UPPTCL referred to as “Power Supply Authority (PSA)” and the LKE (02)-01 Contractor is required to interface with the PSA for the following items: • Take-off points at PSA Substations • Protection Co-ordination • Metering Equipment • Data exchange • 132 kV Cabling		
85.	Vol-1: NIT / Appendix - 29 - Format for Power of Attorney for Signing of Bid / Page 45 of 46	The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.	The Bidder requests the Employer to kindly consider accepting the Power of Attorney with authorized signatory along with the Company Seal, without the requirement of a Common Seal, as this is the practice generally followed in most Metro and Mainline Railway tenders. Kindly confirm.	Tender condition shall prevail
86.	Volume 3 / ERGS / Clause 15.4.4 / page GS 2 of 5 V olume 2 / GCC_SCC / Clause 4.21 / Page 32 of 93	The works area for Contractor’s accommodation will be available to the Contractor on dates set out in the PS. Employer’s Drawings or Appendix 9 of this Specification. 4.21 - Sheds, Stores, Yards It shall be the responsibility of the Contractor to provide at his own expense the required sheds, store houses, and yards for both Permanent and Temporary Works and provide free access to the Engineer and the Engineer’s Representative who will have right of inspection including that of instructing the Contractor to remove a particular material from the stores and not to use the same on the Works.	The Bidder requests the Employer to kindly provide details of the “dates set out in the PS” and the corresponding Employer’s Drawings referenced in the tender documents, as these are required for proper planning and scheduling of the works. Further, the Bidder understands that land/space for the Contractor’s permanent store, required up to completion of the Project and DLP, shall be provided by the Employer free of cost. Kindly confirm our understanding.	The Employer is not obligated to provide dedicated land/space for permanent stores, warehouses or other storage facilities free of cost beyond the work areas made available under the Contract. Provision and maintenance of such facilities shall be entirely at the Contractor’s own arrangement in accordance with Clause 4.21.
87.	Volume 3 / ERGS / Clause 15.8.1 / page GS 2 of 5 .	Offices for the Employer or the Employer’s Engineer Unless otherwise stated in the Contract, the Employer or the Employer’s Engineer may supply his own temporary accommodation on the Site at locations indicated in the Contract or in writing. The Contractor shall afford, provide and maintain free and unhindered access to such Employer or the Employer’s Engineer’s Site offices and parking areas and for the Employer or the Employer’s Engineer’s Site officers, contractors and workmen as may be necessary for installation, inspection, maintenance, repair and removal of the aforesaid Employer or the Employer’s Engineer’s Site offices and the services thereto.	The Bidder understands that the Employer/Employer’s Engineer shall arrange their own temporary site offices and associated facilities. Since no specific provision or BOQ item for construction, establishment, operation, maintenance, utilities, or associated costs of the Employer’s Site Office has been identified under the Contractor’s scope, the Bidder requests confirmation that provision of Employer’s Site Office and related facilities shall not be included in the Contractor’s scope of work.	Please refer chapter 5 of volume 4(ERTS)
88.	Volume 3 / ERGS / Clause 19.3 / page GS 3 of 8 .	19.3 Utilities 19.3.1 The details of existing utilities are given by the employer for information only and the accuracy of the details is not guaranteed. The Contractor shall make his own enquiries and shall carefully excavate trial holes to locate accurately the utilities indicated to him by the utility undertakings.	The Bidder understands that utility shifting, diversion, protection, relocation, obtaining approvals/NOCs from utility agencies, and associated costs are not included within the Contractor’s scope of work under this Contract. Kindly confirm our understanding. If any utility shifting/diversion is required during execution, the same shall be carried out by the Employer and excluded from contractor’s scope of work.	Tender conditions shall prevail
89.	Volume 1 / NIT / Clause 1.2 Key Details / Page 3 . of 37	Approximate cost of work (NIT Value) - Rs. 291.42 Crores (Including GST)	It is observed that the Approximate Cost of Work (NIT Value) is stated as Rs. 291.42 Crores (Including GST). However, Clause 11.1.1 (a) specifies that the Contract Price shall be inclusive of all taxes, duties, levies, cess, royalties, etc., except Goods and Services Tax (GST). In view of the above, kindly clarify whether the Bidder is required to quote the Bid Price inclusive or exclusive of GST.	Please refer tender clause C 2.5 of ITT
	Volume 2 / GCC / Clause 11.1.1 / Page 62 of 93	(a) The contract price, subject to any adjustment thereto in accordance with the contract shall be inclusive of all taxes (except Goods and Services Tax – GST), duties, levies, cess, royalties, etc. and all other incidental charges including custom duty if any, required to fulfil the tender conditions.		
90.	GCC / SCC Clause 11.1 / BOQ	Contract Price / BOQ_322536.xls	Should contractor include GST in the Contract Price in BOQ while quoting or whether it shall be Reimbursed Separately on actual basis. Kindly confirm.	please refer reply of S.No. 89
91.	Additional C 23 / BOQ	Contract Price / BOQ_322536.xls	Should contractor include Custom Duty in the Contract Price in BOQ while quoting or whether it shall be Reimbursed Separately on actual basis. Kindly confirm.	Please refer reply of S.No. 89

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply																																										
92.	Volume 2 / GCC / Clause 2.2 / Page 15 of 93 . Volume 2 / GCC / Clause 8.3 / Page 54 of 93 . Volume 7 / Pricing Document / Clause 8 / Page 4 of 83	2.2 Access to and Possession of the Site If the Contractor suffers delay from failure on the part of the Employer to grant right of access to, or possession of the Site, For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account. 8.3 Delay 8. Price Variation Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause.	With reference to mentioned clause, it is understood that in case of delay by the Employer in granting access to or possession of the Site, the Contractor shall be entitled only to an Extension of Time (EOT) without any monetary compensation. The Bidder submits that timely availability of site access is a critical prerequisite for project execution. Any delay in handing over the site may adversely impact mobilization, resource deployment, productivity, overhead costs, and the overall project schedule. Further, as the Contract provides for fixed prices with limited applicability of Price Variation, prolonged delays in site handover may expose the Contractor to significant unrecoverable cost escalations. Accordingly, the Bidder kindly requests the Employer to: 1. Define a reasonable time limit for handing over the required work fronts/sites. 2. Consider appropriate compensation of additional costs arising from prolonged delays in site handover beyond the stipulated period. Kindly clarify and confirm to mitigate the delay risks.	Tender conditions shall prevail																																										
93.	Volume 5: List of drawing	Track alignment drawings	The Bidder kindly requests the Employer to provide Track Alignment Drawings for the Main Line and Depot, including the connecting lines from Vasantkunj Main Line Station to Vasantkunj Depot, required for estimation and engineering of the Third Rail system.	Please refer addendum 2																																										
94.	Volume 4 / ERTS / chapter 3 / clause 3.1.11 / page no. 40 of 54	Interface with rolling stock contractor	For proper interfacing and detailed engineering of the Third Rail System with the Rolling Stock, the Bidder kindly requests the Employer to provide/clarify the following parameters: · Train length, train weight, and Rolling Stock configuration. · Rolling Stock details including number of cars and current collector shoe arrangement. · Primary suspension dynamic downward movement from nominal position under various loading conditions. · Maximum lateral position/displacement of the current collector shoe. The above information is essential for accurate interface design, conductor rail positioning, and system engineering.	Please refer tender documets. Futher details will be share with successful bidder during Detailed design stage																																										
95.	Vol – 4 _ERTS / Chapter 18 / Clause 18.5.6.1 / Page 19 of 116.	The Electric power is supplied to the rolling stock by means of a conductor Rail known as third Rail. The conductor Rail shall be installed on trackside at the specified distance to the track centreline / top of the Rails. In the double-track line, the conductor Rail shall be installed between both tracks in order to leave sufficient space between for walkways. In stations, it is necessary for safety reasons to install the conductor rail on the side of the track opposite to platform edge.	Bidder understands that the tender clause specifies that the conductor rails at stations shall be installed between both tracks. However, for sections other than station areas, it is understood that the conductor rail is to be installed outside the track. Kindly confirm.	Please follow tender conditons.																																										
96.	Vol – 4 / ERTS / chapter 2 / clause 2.5.5. Traction Sub Station (TSS) / Page 9 of 18	As per the Table minimum capacity of the Feeder mention 6 runs per feeder. <table><tr><th>S. No.</th><th>Major Equipment</th><th>Capacities/Ratings</th></tr><tr><td>1</td><td>33kV AIS (RSS / depot / elevated) / GIS (Underground section)</td><td>1250A</td></tr><tr><td>2</td><td>Rectifier</td><td>2500 kW</td></tr><tr><td>3</td><td>HSCB</td><td>Incomer 6000A, Busbar 10000A and Outgoing 4000A</td></tr><tr><td>4</td><td>Inverter</td><td>1000kW</td></tr><tr><td>5</td><td>DC cables</td><td>300 Sq.mm Copper 6 runs per feeder</td></tr></table>	S. No.	Major Equipment	Capacities/Ratings	1	33kV AIS (RSS / depot / elevated) / GIS (Underground section)	1250A	2	Rectifier	2500 kW	3	HSCB	Incomer 6000A, Busbar 10000A and Outgoing 4000A	4	Inverter	1000kW	5	DC cables	300 Sq.mm Copper 6 runs per feeder	The bidder understands that the minimum number of cables runs per feeder is based on the Traction Power Simulation study and the bidder is free to propose the number of runs per feeder based on the Traction Power Simulation studies.	Please refer Addendum 2 (Tender drawings)																								
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97.	Vol4 _ERTS / Chapter 16 / Clause 16.2.2.6 Third Rail System / Page 6 of 33	Distance between Centre line of the Conductor rail and track centre 1485 mm	The conductor rail is specified at a horizontal distance of 1485 mm from the track center in Vol4 _ERTS, Chapter 16: Third Rail System. However, in Vol5_Tender_Drawings (Drawing No. AGCC01- 11718A-TDR-EST-TR-PWR-71512), the corresponding distance is indicated as 1380 mm. Kindly confirm the correct horizontal distance to be adopted.	Please refer addendum 2																																										
98.	Vol – 4 / ERTS / chapter 15 / clause 15.10.3 / Page 60 of 88	As per the table, The cables in different sections is indicated in Table 15.20. <table><tr><th colspan="3">Table 15.20: 750 V DC Cable Sizing</th></tr><tr><th>SN</th><th>Location</th><th>Cable Size</th></tr><tr><td>1.</td><td>From Transformer to Rectifier</td><td>LV Bus duct</td></tr><tr><td>2.</td><td>From Rectifier to Incomer HSCB Panel</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>3.</td><td>From Rectifier to Negative Return Panel</td><td>Inter-panel Bus bar</td></tr><tr><td>4.</td><td>From each Feeder HSCB Panel to Bypass Panel</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>5.</td><td>From Bypass Panel to each section of third rail</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>6.</td><td>From each running rail to Negative Return Panel</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>7.</td><td>From return panel to Short Circuiting device</td><td>2 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>8.</td><td>Connections of third rail with Disconnector switches and across physical discontinuities in</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr></table> <table><tr><th>SN</th><th>Location</th><th>Cable Size</th></tr><tr><td>9.</td><td>3rd rail for electrical continuity in Main Line</td><td></td></tr><tr><td>9.</td><td>Connections of third rail with Disconnector switches and across physical discontinuities in 3rd rail for electrical continuity in Depot</td><td>6 x (1 x 300 mm² Cu), FRLS/OH</td></tr><tr><td>10.</td><td>From Depot ASS/TSS HSCB to Stinger Load Break Switch panel in Depot</td><td>6 x (1 x 300 mm² Cu), FRLS</td></tr></table>	Table 15.20: 750 V DC Cable Sizing			SN	Location	Cable Size	1.	From Transformer to Rectifier	LV Bus duct	2.	From Rectifier to Incomer HSCB Panel	6 x (1 x 300 mm² Cu), FRLS/OH	3.	From Rectifier to Negative Return Panel	Inter-panel Bus bar	4.	From each Feeder HSCB Panel to Bypass Panel	6 x (1 x 300 mm² Cu), FRLS/OH	5.	From Bypass Panel to each section of third rail	6 x (1 x 300 mm² Cu), FRLS/OH	6.	From each running rail to Negative Return Panel	6 x (1 x 300 mm² Cu), FRLS/OH	7.	From return panel to Short Circuiting device	2 x (1 x 300 mm² Cu), FRLS/OH	8.	Connections of third rail with Disconnector switches and across physical discontinuities in	6 x (1 x 300 mm² Cu), FRLS/OH	SN	Location	Cable Size	9.	3 rd rail for electrical continuity in Main Line		9.	Connections of third rail with Disconnector switches and across physical discontinuities in 3rd rail for electrical continuity in Depot	6 x (1 x 300 mm² Cu), FRLS/OH	10.	From Depot ASS/TSS HSCB to Stinger Load Break Switch panel in Depot	6 x (1 x 300 mm² Cu), FRLS	The bidder understands that the minimum number of DC cable runs for the Third Rail continuity and other location as per Table is based on the Traction Power Simulation study and the bidders are free to propose the number of Cable runs per location based on the Traction Power Simulation studies.	Please refer Addendum 2 (Tender drawings)
Table 15.20: 750 V DC Cable Sizing																																														
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99.	Vol - 4 / ERTS / Chapter 1 / clause 1.4.8.2 / Page 11 of 15 And Vol - 4 / ERTS / Chapter 16 / clause 16.2.2.1 / Page 4 of 33	The Conductor Rail shall be installed at trackside at the specified distance to the track centreline / top of the rails. In the case of double tracks, the Conductor Rails shall be installed between both tracks. In stations, it is necessary by safety reasons the Conductor Rails be installed to the side of the track opposite to the platform edge. and Electric power shall be supplied to the trains by means of a conductor rail known as third rail. The conductor rail shall be installed on trackside at the specified distance to the track centreline / top of the rails. In the double-track line, the conductor rail shall be installed between both tracks in order to leave sufficient space between for walkways. In stations, it is necessary for safety reasons to install the conductor rail on the side of the track opposite to the platform edge. Contractor shall be liable to adhere to the project Schedule of Dimensions (SOD).	As per Document Vol.4 _ERTS (Clauses 1.4.8.2 and 16.2.2.1), the third rail is specified to be located on the inner side of the track. However, in Third Rail sectioning drawing of Main Line No. LKDDC02-TDR- GEN-PST-DWG-38111, the third rail is indicated on the outer side of the track near station platforms. Kindly clarify the correct orientation and installation of the third rail in station platform areas.	Tender conditions shall prevail.																																										
100.	Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.5.11 / Page 11 of 33	The ramps shall be covered with standard cover of suitable length. For conductor rail ramps only, mechanical test are required. The Contractor shall provide respective test procedures.	As the ramp section and the conductor rail section are same, The Bidder understands that mechanical tests conducted on the conductor rail section are in line with standard industry practice and are equally applicable to ramp sections as well. Kindly confirm.	Tender conditions shall prevail.																																										
101.	Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.10 / Page 14 of 33	"At the upper end of the support bracket a molded insulator shall be attached which shall support a cast steel fastener/fix and mobile claw to hold the conductor rail in place. The brackets and fastenings shall be adjustable vertically and horizontally in order to position the conductor rail to the tolerance specified. Consideration must be given to the tolerance and quality of the sleeper ends and slab in providing the required adjustment. Any screws or bolts used to make the adjustment shall be of high-quality stainless steel. After the final adjustment, there shall be sufficient margin to further lower the conductor by at least 20mm to allow for running and conductor rail wear at some future date in the life of system. "	The Bidder understands that Cast Iron may also be used for insulator claws and that the same is acceptable as per standard industry practices. Further, such arrangements have been successfully implemented in similar Metro projects.	Please follow tender conditons.																																										
102.	Vol 4 ERTS Chapter 16 Clause No. 16.2.4.8.10 & 14	At the upper end of the support bracket a molded insulator shall be attached which shall support a cast steel fastener/fix and mobile claw to hold the conductor rail in place. The brackets and fastenings shall be adjustable vertically and horizontally in order to position the conductor rail to the tolerance specified. Consideration must be given to the tolerance and quality of the sleeper ends and slab in providing the required adjustment. Any screws or bolts used to make the adjustment shall be of high-quality stainless steel. After the final adjustment, there shall be sufficient margin to further lower the conductor by at least 20mm to allow for running and conductor rail wear at some future date in the life of system. Clamps (Jaws): The clamps are composed of two half clamps made of cast copper aluminium alloy alternatively cast stainless steel clamps may be accepted subject to its provenness and it is designed to withstand the fault force. The half clamps shall be locked together on rail with two stainless steel pins or by minimum one M8 screw. The mechanical properties, such as Tensile Strength, Yield Point, Elongation and Hardness etc. of the clamps shall be according to NF A 53-709 and is not subject to corrosion. Special plastic bearings shall be inserted on the clamp under the rails and on lateral sides to minimize friction thus allowing the conductor rail to expand and contract freely without damaging the insulator or the conductor rail. Alternatively cast stainless steel clamps may be accepted subject to its provenness and Contractor providing all relevant details.	Insulator claws could be either of cast steel/cast iron/ cast copper aluminum alloy/ cast stainless steel. Kindly add Cast iron in the clauses	Please follow tender conditons.																																										
103.	Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.14 / Page 15 of 33	"Clamps (Jaws): The clamps are composed of two half clamps made of cast copper aluminium alloy alternatively cast stainless steel clamps may be accepted subject to its provenness and it is designed to withstand the fault force. The half clamps shall be locked together on rail with two stainless steel pins or by minimum one M8 screw. The mechanical properties, such as Tensile Strength, Yield Point, Elongation and Hardness etc. of the clamps shall be according to NF A 53-709 and is not subject to corrosion. Special plastic bearings shall be inserted on the clamp under the rails and on lateral sides to minimize friction thus allowing the conductor rail to expand and contract freely without damaging the insulator or the conductor rail. Alternatively cast stainless steel clamps may be accepted subject to its provenness and Contractor providing all relevant details. "	Accordingly, the Bidder requests the Employer to kindly confirm the acceptability of Cast Iron material for insulator claws under the present scope.	Please follow tender conditons.																																										
104.	Vol 4 ERTS Chapter 16 Clause No. 16.2.4.8.11	Support Assembly: The bracket is an interface between the guide way and the insulator. It shall hold and locate the conductor rail with reference to the running rail. The bracket shall allow the adjustment of conductor rail position, laterally and vertically. The lateral adjustment shall be made by using steel washers behind insulator. The vertical adjustment shall be made by using a screw system. The design shall make the adjustment the easiest and the safe.	the lateral adjustment will be performed with slotted holes in the brackets base plate instead of steel washers behind insulators for 2 hole brackets.	Please refer reply of s.no.103 above																																										

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer’s Query	UPMRCL Reply
105.	Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.14 / Page 15 of 33	Clamps (Jaws): The clamps are composed of two half clamps made of cast copper aluminium alloy alternatively cast stainless steel clamps may be accepted subject to its provenness and it is designed to withstand the fault force. The half clamps shall be locked together on rail with two stainless steel pins or by minimum one M8 screw. The mechanical properties, such as Tensile Strength, Yield Point, Elongation and Hardness etc. of the clamps shall be according to NF A 53-709 and is not subject to corrosion. Special plastic bearings shall be inserted on the clamp under the rails and on lateral sides to minimize friction thus allowing the conductor rail to expand and contract freely without damaging the insulator or the conductor rail. Alternatively cast stainless steel clamps may be accepted subject to its provenness and Contractor providing all relevant details.	The Bidder understands that the standard NF A 53- 709 referenced in the tender documents is no longer valid/superseded. Accordingly, the Bidder understands that the vendor may adopt the updated standard NF EN 1982:2008 in place of NF A 53-709 for design, manufacturing, and testing requirements. Kindly confirm our understanding.	Relavent latest standard shall be followed
106.	Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.22 / Page 15 of 33 Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.25 / Page 16 of 33	The insulators shall withstand 15kV industrial frequency voltage in dry conditions for one minute. The voltage being applied between mounting studs and the rail position shall not cause any flashover. The insulator shall possess adequate dielectric strength. It should have no arcing at 10 kV in dry condition and 5 kV in wet condition. It shall not flashover at 15 kV under dry impulse (1.2/50µs, 10 positive and 10 negative pulses).	There appears to be a discrepancy between Clause 16.2.4.8.22 and Clause 16.2.4.8.25 regarding the dielectric test voltage requirements for insulators. While Clause 16.2.4.8.22 specifies a withstand voltage of 15 kV for one minute under dry conditions, Clause 16.2.4.8.25 indicates no arcing at 10 kV in dry conditions. Bidder understands that the minimum test voltage for one-minute duration in dry conditions is 10 kV. We request you to kindly clarify and harmonize these requirements accordingly.	There is no discrepancy in the specified requirements. The values correspond to different dielectric performance tests. The insulator shall comply with all the requirements specified in the Contract.
107.	Vol - 4 / ERTS / Chapter 16 / clause 16.3.7.1 / Page 25 of 33	The Contractor shall design the ramp profiles by mathematical simulation followed by laboratory testing, with a view to: a) Minimizing the ramp length by optimizing the ramp angle for the applicable design speeds taking into account the mass / spring / damper properties of the current collection shoe; and b) Minimizing arcing (or minimizing the frequency of ramp renewals due to arcing) which occurs when a current collection shoe which is drawing current becomes isolated from the supply	Clause 16.3.7.1(a) links the ramp slope design to the impact load characteristics of the Current Collection Shoe (CCS), including its mass, spring, and damping properties. However, the Bidder understands that the CCS design, along with its impact resistance and failure criteria under defined impact loads, falls under the scope and responsibility of the Rolling Stock Contractor. Accordingly, the associated analysis, validation, and optimization of ramp slope design based on CCS characteristics should also be carried out by the Rolling Stock Contractor. Therefore, the Bidder requests the Employer to kindly clarify the scope responsibility and confirm that the Third Rail Contractor shall not be held responsible for CCS design-related impact analysis parameters that are dependent on Rolling Stock design characteristics.	Being a Design-Build Contract, the Third Rail Contractor shall be responsible for the design and performance of the Third Rail System, including interface compatibility with the Rolling Stock based on the interface parameters provided by the Employer/Rolling Stock Contractor. Necessary analysis and validation shall form part of the Contractor’s scope. No separate payment shall be made on this account.
108.	Vol - 4 / ERTS / Chapter 16 / clause 16.3.8.1.1 / Page 25 of 33 Vol - 4 / ERTS / Chapter 16 / clause 16.3.8.3.8 / Page 27 of 33	The Contractor shall demonstrate by laboratory testing of his proposed design that: a) Adequate fatigue endurance will exist in the support arm and all components; and b) Sufficient resilience in the fastening between the conductor rail and the support claw will be sufficient to avoid accelerated component wear Mechanical Loading: The expected worst case static and dynamic loading in both vertical (downwards and upwards) and horizontal (parallel and perpendicular to the rail) direction shall be determined by analysis. Destructive and non-destructive loading tests shall be performed on 3 and 5 complete support insulator assemblies respectively to demonstrate the capability of the support assembly to withstand the expected loading.	We understand that the mechanical loading tests to demonstrate these requirements shall be conducted as per the provisions specified under Clause 16.3.8.3.8. We request you to kindly confirm this understanding and clarify accordingly.	Inspection and testing requirements shall be as specified in the Contract. Routine tests may be carried out on each insulator and type/sample tests on a batch-wise basis in accordance with the relevant standards and the provisions of the Contract, subject to approval by the Engineer.
109.	Volume 4: Employer’s Requirements- Technical Specifications Chapter 2- scope of work Clause No. 2.5.6	Mechanical Loading: The expected worst-case static and dynamic loading in both vertical (downwards and upwards) and horizontal (parallel and perpendicular to the rail) direction shall be determined by analysis. Destructive and non-destructive loading tests shall be performed on 3 and 5 complete support insulator assemblies respectively to demonstrate the capability of the support assembly to withstand the expected loading.	mechanical loading- Only nondestructive tests based on worst case loads calculated in the mechanical and electrical calculation note is applied to the insulator assemblies.	Please refer reply of s.no.108 above
110.	Vol - 4 / ERTS / Chapter 16 / clause 16.3.8.3.3 / Page 26 of 33 Vol - 4 / ERTS / Chapter 16 / clause 16.2.4.8.25 / Page 16 of 33	Dielectric Strength: Ten insulators shall each be tested in accordance with ASTM D 149 Method A Short Time Test. A 60 Hz AC voltage shall be applied for 1 minute between top and bottom in air at ambient temperature and humidity, increasing at approximately 1000 volts per second up to 15 kV rms. There shall be no flashovers, and the insulators shall not break down during the time the 10000 volts are applied. and The insulator shall possess adequate dielectric strength. It should have no arcing at 10 kV in dry condition and 5 kV in wet condition. It shall not flashover at 15 kV under dry impulse (1.2/50µs, 10 positive and 10 negative pulses).	Clause 16.3.8.3.3 specifies dielectric strength testing up to 15 kV rms for one minute, whereas Clause 16.2.4.8.25 defines the performance criteria as no arcing at 10 kV under dry conditions. The Bidder understands that the applicable test voltage for one-minute duration under dry conditions shall be 10 kV, in line with Clause 16.2.4.8.25. Accordingly, we request the Employer to kindly clarify and align the requirements of both clauses to avoid ambiguity during design validation and testing.	There is no ambiguity in the specified requirements. The 15 kV rms for one minute requirement pertains to dielectric withstand strength, whereas the 10 kV dry and 5 kV wet requirements pertain to arcing performance. The insulators shall comply with all the specified requirements of the Contract.
111.	Vol - 4 / ERTS / Chapter 16 / Clause 16.3.8.4.1 / Page 27 of 33	Each insulator shall be inspected for: a) Uniform surface with no visible cracks, hollows, inclusions or surface defects, the insulators showing any of these defects shall be rejected. b) Important dimensions of the insulator c) Molding protrusions on edges of surface of the molding shall not exceed 2mm above the general surface level. d) Electrical resistance of each insulator shall be measured at room temperature and under dry conditions, and it shall be not less than 100 mega ohms. e) From each batch of 1000 insulators, 3 shall be cut along the shortest internal path and the cross-section studied. There shall be no voids in the cross-section greater than 2 mm diameter and no significant accumulation of such voids, which might lead to internal breakdown. There shall also be no internal cracks.	The referenced clause specifies inspection and testing requirements for each insulator. However, since all insulators are manufactured using the same mould and controlled production process, it is standard industry practice to conduct detailed inspection and testing on a random sampling/batch- wise basis rather than on every individual insulator. The Bidder understands that the specified tests may be carried out on a batch-wise sampling basis, as also partially indicated in sub-clause (e). Accordingly, we request the Employer to kindly confirm this understanding and clarify the acceptable inspection and testing methodology, including the applicable sampling criteria/frequency for routine and type tests.	Inspection and testing shall be carried out in accordance with the provisions specified in the Contract. The sampling criteria specified under sub-clause (e) shall apply as stated, and no other deviation is envisaged.
112.	Vol - 4 / ERTS / Chapter 16 / Clause 16.2.4.9.5 / Page 16 of 33 Vol - 4 / ERTS / Chapter 16 / Clause 16.3.9.1.4 / Page 27 of 33	Dielectric strength of UPVC and GRP shall be such that it should have no arcing at 10 KV in dry condition and 5 KV in wet condition. They shall not flashover at 15 KV under dry impulse (1.2/50µs, 10 positive and 10 negative pulses). The protective cover material shall withstand the following test voltages, which are related to a rated voltage of 750 V dc. a) Power frequency withstand voltage 5 kV for wet and 10 kV for dry b) Impulse withstand voltage: i. Lower impulse level 13 kV ii. Upper impulse level 15 kV	Bidder understands that the dielectric testing of UPVC and GRP covers shall be carried out in accordance with Clause 16.2.4.9.5. Kindly Confirm.	Please follow tender conditions.
113.	Vol - 4 / ERTS / Chapter 16 / table 16.4 / Page 33 of 33 Vol - 4 / ERTS / Chapter 16 / clause 16.3.2.1 / Page 33 of 33	Table 16.4 Test sheet for Third Rail & its Accessories 16.3.2.1 Development / Type Tests	The Bidder understands that the applicable Type Tests and Routine Tests shall be derived based on the Development Tests specified under Clause 16.3.2.1. Further, the Bidder understands that the Factory Acceptance Tests (FAT) shall be conducted based on the applicable Routine Tests. Accordingly, we request the Employer to kindly confirm this understanding and clarify the applicable testing framework, including the relationship and applicability of Development Tests, Type Tests, Routine Tests, and FAT requirements.	Testing requirements, including Development/Type Tests, Routine Tests and Factory Acceptance Tests (FAT), shall be carried out in accordance with the provisions specified in the Contract.
114.	Volume 4 / ERTS / Chapter 15 / Clause 15.18.10.2 / Page	The rating at 50 deg.C shall be 1.0 MW for continuous operation and the overloading capability shall be 150% for two (2) hours and 300% for one (1) minute of continuous operation according to Class VI of IEC 60146. The inverter will have a voltage detection type with constant or adjustable current and voltage features. The inverter shall have voltage and current detections sensors to regulate the current during inverting mode. The inverter shall have a rated voltage at rated continuous load. The continuous rating shall be defined as the output that can be delivered continuously at rated full load voltage.	The Bidder understands that operation under Class VI duty may not be practically applicable for the present application, as continuous regeneration for durations such as 2 hours or even 1 minute is not envisaged under normal operating conditions. Accordingly, the Bidder proposes the following inverter duty cycle for consideration: “30 [s] ON(1): · Linear increase from no-load to peak power in 2 [s] · Constant peak power during 8 [s] · Linear decrease from peak power to no- load in 20 [s] 100 OFF(1) Load period: 130 [s]” Kindly confirm if the same is acceptable.	Please follow tender conditons.
115.	Vol 4 ERTS Chapter 15 Clause No. 15.18.1.10.2	The rating at 50degC shall be 1.0 MW for continuous operation and the overloading capability shall be 150% for two (2) hours and 300% for one (1) minute of continuous operation according to Class VI of IEC 60146. The inverter will have a voltage detection type with constant or adjustable current and voltage features. The inverter shall have voltage and current detections sensors to regulate the current during inverting mode. The inverter shall have a rated voltage at rated continuous load. The continuous rating shall be defined as the output that can be delivered continuously at rated full load voltage.	The Inverter solution requested is Class VI. May we also propose an alternate overload class that shall suit the Inverter operation? Please confirm.	Please refer reply of s.no 114 above
116.	Volume 4 / ERTS / Chapter 15 / Clause 15.5.6.4 / Page 40 of 88 Volume 4 / ERTS / Chapter 15 / Table 15.8: Rectifier Transformer Rating / Page 35 of 88	Test on insulation: The test consists of applying DC high voltage (2500 V or 5000 V) with the help of a motor driven megger, continuously between winding and earth, and measure insulation resistance at the end of 10 second and 60 seconds. The polarization ratios R60/R10 and R600/R60 should not be less than 1.4 and 1.2 respectively. (R10, R60 and R600 are the insulation resistance values after 10 seconds, 60 seconds and 600 seconds respectively).	The Bidder would like to submit that Insulation Resistance (IR) and Polarization Index (PI) tests are not specifically listed under the standard routine/type tests in applicable IS/IEC standards for Dry Type Transformers. Further, since the insulation medium for Dry Type Transformers is Cast Resin, it is difficult to predict and guarantee specific PI values as demanded in the specification. Due to inherent limitations of the measuring equipment and the phenomenon of leakage current during measurement, it may also not be feasible to obtain stable readings at the 10- second interval. Accordingly, the Bidder understands that: · IR and PI tests, if required, shall be conducted as per project requirement using a battery-operated 5000 VDC Insulation Tester (Megger). · Measured IR and PI values shall be provided for reference/information purposes only and shall not be linked to any guaranteed minimum values or acceptance criteria. Kindly confirm our understanding and clarify the applicable acceptance criteria for these tests.	Tender condition shall prevail

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply																																																			
117.	Volume 4 / ERTS /Chapter 15 / Clause 15.3.4.1 & 15.3.4.4 & table 15.2 Coupling Disconnecter Switch / Page 8 & 9 of 88	15.3.4.1 The HSCB shall consist of various types of panels depending on the adopted configuration at a specific location. The site specific configurations have been indicated in the Power Schematic Diagram and sectioning schemes. A typical configuration at a ASS/ TSS may be as follows; a) 2 incoming feeder panel from rectifiers b) 4-line feeder panels c) 4 nos. motorized isolator feeding third rail d) 2 load bypass breaker / disconnecter panels (as per tender drawings) 15.3.4.4.1 The Bypass Disconnecter Panel connects two adjacent 3rd rail sections in case of an outage of an ASS/TSS. These panels shall be placed at track side/inside TSS room. The design of the Dis-connector Panel shall include following features: a) Dis-connector switch b) Push button for ON/OFF with LEDs for status indication. <table><tr><td>1.</td><td>Type</td><td>Feeder Disconnecter switch</td><td>Coupling Dis-connector Switch</td></tr><tr><td>2.</td><td>Governing Specifications</td><td>EN 50123 or IEC 61992</td><td>EN 50123 or IEC 61992</td></tr><tr><td>3.</td><td>Nominal Voltage</td><td>750 V DC</td><td>750 V DC</td></tr><tr><td>4.</td><td>Rated Insulation voltage</td><td>1800 V</td><td>1800 V</td></tr><tr><td>5.</td><td>Rated continuous current</td><td>4000 A</td><td>4000 A</td></tr><tr><td>6.</td><td>Short circuit current</td><td>125 kA for 250 ms</td><td>125 kA for 250 ms</td></tr><tr><td>7.</td><td>Operation</td><td>Offload, Motorized</td><td>Off-load Motorized</td></tr></table>	1.	Type	Feeder Disconnecter switch	Coupling Dis-connector Switch	2.	Governing Specifications	EN 50123 or IEC 61992	EN 50123 or IEC 61992	3.	Nominal Voltage	750 V DC	750 V DC	4.	Rated Insulation voltage	1800 V	1800 V	5.	Rated continuous current	4000 A	4000 A	6.	Short circuit current	125 kA for 250 ms	125 kA for 250 ms	7.	Operation	Offload, Motorized	Off-load Motorized	As per Clause 15.3.4.1, the HSCB configuration at ASS/TSS includes Load Bypass Breaker / Disconnecter Panels. Further, Clause 15.3.4.4.1 specifies that the Bypass Disconnecter Panel is intended to connect two adjacent 3rd rail sections during outage conditions and describes the panel comprising: · Disconnecter switch · Push button control with status indication However, it is observed that: · In certain tender clauses and earlier TSS drawings, the device is referred to as an off- load disconnector. · Whereas, in the revised TSS Single Line Diagram (SLD), the same function is represented using a Load Break Switch (LBS). This leads to ambiguity in the functional and technical requirement of the coupling/bypass arrangement. The Employer is requested to confirm the intended requirement for the coupling/bypass functionality.	The requirements specified in the latest Tender Drawings and SLDs shall prevail. Being a Design-Build Contract, the successful bidder shall finalize the appropriate arrangement for the coupling/bypass functionality during detailed design, ensuring compliance with the specified operational, safety and reliability requirements, subject to approval by the Engineer/Employer. No additional payment shall be made on this account.																							
1.	Type	Feeder Disconnecter switch	Coupling Dis-connector Switch																																																				
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118.	Addendum 2 : Annexure 18	Typical SLD of ASS/TSS	The Incoming breaker of DC switchgear is shown as RCB whereas in technical Specification it has been mentioned as HSCB, please clarify the requirement.	It will be HSCB.																																																			
119.	Volume 4 / ERTS / Chapter 12 / Clause 12.8.3.1.1 / Page 44 of 88	All controls of RSS/AMS shall be centralized at a control panel with mimic diagram in the control room.	Bidder request Employer to Kindly clarify whether the Control Panel is to be offered as an integral part of the Switchgear assembly or if a separate stand- alone Control Panel is required.	Being a Design-Build Contract, the feasibility and configuration of the centralized control panel with mimic diagram shall be finalized by the successful bidder during the detailed design stage and implemented, if required, in compliance with the functional requirements of the Contract. No additional payment shall be made on this account.																																																			
120.	14.2.5.2.5	Equipped with riveted marking plates and single-wire diagrams	We understand this as mimic diagram with semaphore indicator. Kindly confirm if our understanding is correct.	Please refer s.no. 119 as above.																																																			
121.	Addendum 2: Annexure 23, table no. 3.1.15 sr. no. 2	<table><tr><td>2</td><td>Supply, laying, installation of 33kV Cables from PSA QSSs (Jehla & Hardot Road to Vasantkunj RSS)</td><td>a. Shall provide necessary assistance for installation of cables and terminations inside Vasantkunj Depot. b. Shall co-ordinate with PSA for smooth supply, laying & installation cables and its terminations at either end. c. Shall coordinate with PSA for laying of cables inside Depot. d. Shall co-ordinate with PSA for deciding the location of existing cables from PSA QSSs</td><td>a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end.</td></tr></table>	2	Supply, laying, installation of 33kV Cables from PSA QSSs (Jehla & Hardot Road to Vasantkunj RSS)	a. Shall provide necessary assistance for installation of cables and terminations inside Vasantkunj Depot. b. Shall co-ordinate with PSA for smooth supply, laying & installation cables and its terminations at either end. c. Shall coordinate with PSA for laying of cables inside Depot. d. Shall co-ordinate with PSA for deciding the location of existing cables from PSA QSSs	a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end.	Cable termination at both ends is mentioned under the Power Supply scope. In this regard, the Bidder seeks clarification regarding the termination point at the RSS end. Kindly clarify whether the cable termination at RSS shall be considered at the Metering Panel, or the RSS 33 kV Switchgear.	Cable termination at the RSS end, including termination at the metering panel to 33 kV switchgear as applicable, shall be under the scope of the Traction Contractor. No additional payment shall be made on this account.																																															
2	Supply, laying, installation of 33kV Cables from PSA QSSs (Jehla & Hardot Road to Vasantkunj RSS)	a. Shall provide necessary assistance for installation of cables and terminations inside Vasantkunj Depot. b. Shall co-ordinate with PSA for smooth supply, laying & installation cables and its terminations at either end. c. Shall coordinate with PSA for laying of cables inside Depot. d. Shall co-ordinate with PSA for deciding the location of existing cables from PSA QSSs	a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end.																																																				
122.	Addendum 2: Annexure 18	Depot layout	It is observed that the location of the Depot TSS/ASS Building is not indicated in the provided Depot Layout drawings. The Bidder kindly requests the Employer to provide the location/layout details of the Depot TSS/ASS Building, as the same is essential for cable routing, interface planning, quantity estimation, and detailed engineering.	Please refer Addendum 4																																																			
123.	Addendum 2: Annexure 11 & annexure 15	Annexure -11 NOTE: The contractor shall take into consideration for providing: i) *Two additional 33kV spare switchgears at each end station (Charbagh and Vasantkunj) & RSS/AMS of East West corridor (total six (2+2+2) numbers of CBs) and it shall be included in the cost of the tender. ii) Additional space provision for Two 33kV spare switchgears at Musabagh & Medical Chauraha station Annexure 15 12.1.2 33 kV HIGH VOLTAGE BAYS (RSS) 12.1.2.1 The high voltage bays shall contain: a) Two incoming sections equipped with circuit breaker b) One bus coupling section equipped with a circuit breaker c) Four outgoing feeder Bays (1 for each circuit) consisting of circuit breakers for feeding ; Bus Bar extension links for connection of MV outgoing cables to Vasantkunj ASS/TSS and or Depot ASS/TSS.	It is observed that Annexure 11 specifies the requirement of two future spare feeders for the RSS Switchgear. However, in Annexure 15, no corresponding requirement for spare feeders in the RSS is mentioned. In view of the above discrepancy, the Bidder kindly requests the Employer to clarify the exact requirement and quantity of spare feeders to be considered under the RSS Switchgear scope.	Please follow Annexure 11 of Addendum-2. The requirements specified therein shall prevail.																																																			
124.	Addendum 2 / Annexure 29	Schedule of Key Dates	It has been observed that for the Non-Priority Section, completion of Site Acceptance Testing (SAT) for all systems is scheduled by Week 106, whereas Energisation is planned only by Week 160, resulting in a gap of approximately 54 weeks. The Bidder kindly requests the Employer to reverify the milestone schedule, as such a prolonged gap after completion of SAT may lead to substantial idling of manpower, resources, and project teams for nearly one year, resulting in significant time and cost implications to the Contractor. Accordingly, the Bidder requests the Employer to review and align the milestone timelines suitably to ensure practical and efficient project execution.	Site access and work fronts shall be handed over progressively. The Contractor shall coordinate and interface with the designated contractors for execution and scheduling of the works. No change in the milestone schedule is envisaged.																																																			
125.	General .	Request for time extension	The Bidder requests the Employer to consider extending the bid submission date by six (6) weeks. The tender involves extensive design, engineering, interface assessment, quantity estimation and coordination with multiple stakeholders. However, several critical inputs required for accurate bid preparation, such as track alignment drawings, depot layout drawings, cable routing drawings, sectioning diagrams and other engineering documents are not available and yet to be provided. Therefore, we kindly request the Employer to extend the bid submission deadline by six (6) weeks.	Please refer addendum 3																																																			
126.	1.4.2 Minimum Eligibility Criteria: A. Work Experience: Key Activity E: SCADA	Key Activity E: SCADA Supply, installation, testing & commissioning SCADA System for Metro Rail/ Suburban Rail/ Main line Railways/ Mono Rail/Tramways for minimum length of nine Track km (9 Tkm) Subcontractor is permitted only for Key Activity item 2(e). For all other key activities primary contractor shall be responsible either as a single entity or as JV/Consortium	As per clause 2.7. Vendor Approval and Selection Procedure, Equipment's for SCADA System, Page 18 of 18 of chapter 2, Volume 2 "Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 5 years in a Mono rail/Tram/Metro Project". We request UPMRCL to kindly clarify on the ambiguity on SCADA supplier credentials provided under the 2 different clauses of the tender document i.e eligibility criteria and vendor approval.	Both conditions have to be followed																																																			
127.	Vol 5, Tender Drawings Sr No 87 to 100 Page 3 of 87	<table><tr><td>N</td><td>SCADA SCMS ETS FOR EAST WEST CORRIDOR</td><td></td></tr><tr><td>87</td><td>SCADA SCMS ETS FOR EAST WEST CORRIDOR</td><td>UNDER PROCESS</td></tr><tr><td>88</td><td>SCADA SCMS ETS FOR EAST WEST CORRIDOR</td><td>UNDER PROCESS</td></tr><tr><td>89</td><td>SCADA SCMS ETS FOR EAST WEST CORRIDOR</td><td>UNDER PROCESS</td></tr><tr><td>90</td><td>SCMS SCHEME</td><td>DONE</td></tr><tr><td>91</td><td>ETS GENERAL ARRANGEMENT (ELEVATED STATIONS)</td><td>DONE</td></tr><tr><td>92</td><td>ETS GENERAL ARRANGEMENT (UNDERGROUND STATIONS)</td><td>DONE</td></tr><tr><td>93</td><td>TYPICAL POLE MOUNTED OUTDOOR ETS</td><td>DONE</td></tr><tr><td>O</td><td>SCADA FOR NORTH SOUTH CORRIDOR</td><td></td></tr><tr><td>94</td><td></td><td></td></tr><tr><td>95</td><td></td><td></td></tr><tr><td>96</td><td></td><td></td></tr><tr><td>97</td><td></td><td></td></tr><tr><td>P</td><td>SCADA FOR CENTRALISED OCC</td><td></td></tr><tr><td>98</td><td></td><td></td></tr><tr><td>99</td><td></td><td></td></tr><tr><td>100</td><td></td><td></td></tr></table>	N	SCADA SCMS ETS FOR EAST WEST CORRIDOR		87	SCADA SCMS ETS FOR EAST WEST CORRIDOR	UNDER PROCESS	88	SCADA SCMS ETS FOR EAST WEST CORRIDOR	UNDER PROCESS	89	SCADA SCMS ETS FOR EAST WEST CORRIDOR	UNDER PROCESS	90	SCMS SCHEME	DONE	91	ETS GENERAL ARRANGEMENT (ELEVATED STATIONS)	DONE	92	ETS GENERAL ARRANGEMENT (UNDERGROUND STATIONS)	DONE	93	TYPICAL POLE MOUNTED OUTDOOR ETS	DONE	O	SCADA FOR NORTH SOUTH CORRIDOR		94			95			96			97			P	SCADA FOR CENTRALISED OCC		98			99			100			Request UPMRCL to kindly share the drawings related to SCADA architecture and works which are missing in the Volume-V.	Please refer Addendum 2
N	SCADA SCMS ETS FOR EAST WEST CORRIDOR																																																						
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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
128.	Vol 7, Pricing Document Sr No 10.9SCADA	10.9.1 The Bill of Quantity for SCADA system at OCC & BCC and RTU for North South (CCAP to MSPA) & East West Corridor (Charbagh to Vasantkunj) of Lucknow Metro Rail is presented in BOQ Bill Nos. 9.1. For detailed specifications, the Chapter 18 of TS and tender drawing shall be referred to.	Request UPMRCL to confirm in case of discrepancy between the details mentioned in TS, tender drawing and Bill of quantity, what section will supersede and bidder has to supply the material as per which section/volume.	Please refer Addendum 2
129.	Chapter-18: SCADA, Page 9 of 116 18.4.1.8	At some elevated and underground stations, ASS/TSS are housed in a single room. Therefore, at those elevated and underground stations, Single RTU shall be provided for ASS cum TSS room. Design of RTU shall ensure that I/O modules of each ASS/TSS functions are separated / independent	Request UPMRC to kindly confirm the name of the elevated and underground stations, where single RTU has to be supplied by the contractor.	Please refer Addendum 2
130.	Chapter-18: SCADA, Page 9 of 116 18.4.1.9	All the RTU's in East West Corridor and North South Corridor of Lucknow Metro shall communicate with SCADA Servers at OCC and BCC over specified communication network on IEC 60870-5-104 protocol through OFC backbone network to be provided by designated Telecom contractor.	Request UPMRCL to kindly confirm that new RTUs supplied in East West Corridor have to communicate over secure on IEC 60870-5-104 protocol, which also meets the requirement of 18.12.6.4 Cyber Security encryption as per IEC 62351 mentioned in the tender specification while the older RTUs supplied under North South corridor will keep communicating over IEC 60870-5-104 protocol without encryption as per IEC 62351 mentioned under clause 18.12.6.4 Cyber Security encryption	Please refer tender conditions
131.	Chapter-18: SCADA, Page 10 of 116 18.4.1.11	RTU in redundant configuration shall be provided at each RSS/AMS. Each IED shall communicate with RSS/AMS RTU over dual network of IEC 61850 protocol.	RTU redundancy will be limited to CPU, PSU and communication modules (both to SCADA master & Field devices). Kindly confirm.	Please refer tender conditions
132.	Chapter-18: SCADA, Page 10 of 116 18.4.1.11	Each RTU shall have necessary communication ports with provision of redundant ports: - ☐ To transmit RSS/AMS data to OCC over IEC 60870-5-104 protocol ☐ To transmit RSS/AMS data to BCC over IEC 60870-5-104 protocol	Communication will be over secure on IEC 60870-5-104 protocol with encryption as per IEC 62351 mentioned at 18.12.6.4 Cyber Security. Kindly confirm.	Please refer tender conditions
133.	Chapter-18: SCADA, Page 10 of 116 18.4.1.13	SCADA system proposed for EW corridor shall be smoothly integrated & commissioned with existing North South corridor SCADA system at OCC and respective BCC including SAS at both RSS(TPNR RSS & MSPA RSS) for seamless operation.	We understand that both corridor SCADA will be independent one corridor is on AC traction and other corridor is on DC traction. Kindly confirm.	Please refer tender conditions
134.	Chapter-18: SCADA, Page 11 of 116 18.5.1.1 Scope of Supply and Service	n) DLP / Warranty for complete SCADA system for both corridor (N-S & E-W), SCMS, RTUs and all equipment supplied under this contract for 2 years. o) Comprehensive AMC of Complete SCADA System for both corridor (N-S & E-W) for 3 Years (after DLP period)	We understand that DLP and comprehensive AMC is limited to the equipment supplied under the present contract. Previous supplied equipment for corridor N-S are excluded. Kindly confirm.	Please refer tender conditions
135.	Chapter-18: SCADA, Page 14 of 116 18.5.2.6 DeploymentOf Staff During DLP and AMC Period	The contractor shall deploy minimum 4 nos of SCADA engineers (OEM Certified) including rest or leave reliever at Lucknow metro site.	We understand that SCADA OEM has to deploy his engineer during DLP and AMC. Kindly confirm.	Confirmed.
136.	Chapter-18: SCADA, Page 15 of 116 18.5.2.6.2 Spares and T&P kept by contractor at Lucknow metro site	Contractor shall provide all the spares and T&Ps to maintain equipments mentioned under the scope of work as mentioned below	We understand that these spares and T&P are over and above the spares and T&P mentioned in the bill of quantity in the price schedule. Kindly confirm.	Bidder understanding is correct
137.	Chapter-18: SCADA, Page 20 of 116 18.6.2.8	Any key components of RTU like CPU card, Power Supply Card, Communication Card, Power Supply Converter etc. shall be considered in dual redundant and auto changeover configuration. Network Switch shall also be provided in dual redundant configuration.	We understand communication port both to the SCADA master end and to the field devices like IEDs/ MFTs have to be redundant. Kindly confirm.	Bidder understanding is correct
138.	Chapter-18: SCADA, Page 20 of 116 18.6.5.5	Whereas at BCC of East West Corridor the SCADA Communication Server shall be provided as a non-redundant standalone system and upgradation of BCC for N-S corridor as per existing architecture	We understand that the equipment to be supplied at BCC and RSS of N-S corridor will be as per CHAPTER-18(II) Up-gradation of existingSCADA. Kindly confirm.	Bidder understanding is correct
139.	Chapter-18: SCADA, Page 23 of 116 18.6.5.14	One no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software is installed in each existing RSS of N-S corridor and one no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software to be installed at Vasantkunj depot RSS/AMS of E-W corridor by the contractor with facility of its Remote Desktop at OCC & BCC	We understand that DR workstation will be for the IEDs/Relays for the particular RSS only. Kindly confirm.	Please follow tender condition
140.	Volume 4: ERTS, Clause 18.6.5.14 Page 517/651	One no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software is installed in each existing RSS of N-S corridor	Kindly provide the technical details of the existing RSS relays. Additionally, please confirm whether the relays installed at the existing RSS are equipped with a disturbance recorder facility.	It will be provided to successful bidder during detailed design stage. DR facility is available at Existing RSS.
141.	Chapter-18: SCADA, Page 27 of 116 18.7.1.12	The Contractor shall provide portable programming devices / Laptops, including all the associated software, to enable the maintenance personnel to test or interrogate items of the SCADA equipment locally, i.e. without using the SCADA communication network	Kindly confirm the number of laptops to be provided for the E-W corridors.	Please refer both Chapter 9 & Chapter 18 (II) of Vol 4 ERTS of Tender Documents
142.	Technical Specification Chapter-18 SCADA Page 39 of 116 18.8.8.5,	The external network attached storage system shall utilize optical disc technology, which shall allow the data to be indexed and shall allow random and sequential searches.	SATA based NAS devices are used in current designs with more ease of use and management. Can we consider the same, in place of optical disks as mentioned in tender document?.	Agreed
143.	Technical Specification Chapter-18 SCADA Page 41 of 116 18.8.12.1	In order to ensure adequate safety and reliability for the operation, SCADA equipment mainly (SCADA servers, all network devices, key components of RTUs) shall be fullyduplicated for redundancy.	Redundancy will be provided at BCC as per the details provided in the technical specification and BoQ. Kindly confirm.	Please refer tender conditions
144.	Technical Specification Chapter-18 SCADA Page 53 of 116 18.12.1.2	f) Each RSS/AMS RTU/gateway shall have necessary redundant communication port for transmit RSS data (analogue data, metering data and CBs Operating Status only) to UPPTCL SLDC through wireless communication over Web network with Firewall protection for the purpose of remote viewing only, if required. Any modem or wireless communication device and Firewall for external interface shall be supplied by SCADA contractor	Bidder scope is limited to supply of Modem/wireless communication media along with Firewall at RSS/AMS end. Kindly confirm.	Please refer tender conditions
145.	Technical Specification Chapter-18 SCADA Page 53 of 116 18.12.1.4	Digital Input Modules: It shall have 16 optically isolated channels per modules and shall support time stamping with time resolution of 1 ms with buffering up to 3 changes.	We understand the bidder can propose DI module with minimum 16 or more optically isolated channels. Kindly confirm.	To be confirmed by the contractor during detailed design stage as per requirement
146.	Technical Specification Chapter-18 SCADA Page 58 of 116 18.12.6.4 Cyber Security	Proper Encryption in the field data (data from RTU to OCC/BCC) shall be implemented as per IEC 62351 Standards as applicable.	Kindly confirm whether IEC 62351 certification for encryption on IEC-104 protocol from CPRI, Bengaluru as per Ministry of Power order no. 25-10/72/2024-PG dated 6 th August 2025 for RTUs to be installed in India has to be furnished by the contractor.	Please refer Clause No. 18.2 , Chapter 18 (I) of Vol 4 (ERTS)

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
147.	Technical Specification Chapter-18 SCADA Page 62 of 116 Table 18.8: Details of Server	18.14.2 Hardware Configuration The minimum configuration for various data processing equipment are as follows. 18.14.2.1 Server PowerEdge R470 Server, Enterprise Processor: Intel Xeon 6Performance	We understand that Dell PowerEdge or equivalent make Servers can be supplied by the contractor. Kindly confirm.	Confirmed.
148.	Technical Specification Chapter-18 SCADA Page 63 of 116 18.14.2.2 Workstation	Table 18.9: Details of Workstation Ethernet Ports (LAN) 2x Onboard 10/100/1000 mbps Ethernet ports 3xDual Port 10/100/1000 mbps Ethernet card	Kindly confirm that total 5 nos 10/100/1000 mbps are required to be supplied with the workstation.	To be confirmed by the contractor during detailed design stage as per requirement
149.	Technical Specification Chapter-18 SCADA Page 63 of 116 18.14.2.2 Workstation	Table 18.9: Details of Workstation Auxiliary Memory (SSD)- 2x1 TB -Ent.24x7-7K-SSD	SSD memory for Enterprise/server drivescomes with 960GB and not 1TB storage. We request UPMRCL to kindly allow Auxiliary Memory (SSD)- 2x 960 GB in workstations.	Agreed
150.	Technical Specification Chapter-18 SCADA Page 80 of 116 18.19.10.1	An NMS shall also be provided at OCC by SCADA contractor for monitoring the status, performance, statistics, errors and alarms of all switches, routers and all other active nodes of SCADA dedicated FO network system for both corridors (N-S Corridor & E-W corridor).	We understand that separate NMS has to be supplied for (N-S Corridor & E-W corridor) and both will have separate SCADA systems. Kindly confirm.	Confirmed.
151.	Technical Specification Chapter-18 SCADA Page 81 of 116 18.19.10.4	The minimum technical specifications of NMS hardware server shall be as follows. 19" 4U RACKMOUNTABLE INDUSTRIAL PC Hard Disk-1*2TB SATA SSD. (RAID 5 controller)	1. While the SCADA servers asked in the specification are Poweredge 740, Industrial grade NMS hardware server to be installed at OCC and BCC should also be Poweredge 740 or equivalent. 2. We understand the NMS software at RSS/OCC/BCC will be used to monitor the equipment's at individual locations. Kindly confirm.	1. Bidder understanding is correct. 2. Please follow tender conditions
152.	Technical Specification CHAPTER-18(II) Up-gradation of existingSCADA Page 1 of 14 CHAPTER-18(II)	Up-gradation of existing SCADA System (Make-ABB) installed at BCC server room, TPNR RSS & MSPA RSS of Lucknow Metro.The contractor will provide a Dual Power Supply scheme for server and other associated hardware.	Bill of material and technical specifications for the hardware to be supplied at BCC server room, TPNR RSS & MSPA RSS of Lucknow Metro (N-S) corridors will be per CHAPTER-18(II) .Kindly confirm.	Bidder understanding is correct
153.	Vol 4 ERTS Clause 18.4.1.14 Page 514/651	Any addition/modification/upgradation at hardware level as well Software level (at each level and layer) required for integration of North South Corridor and East-West corridor SCADA will be covered	As per our understanding, the scope of work includes only Control Center level upgradation activities. Any modification, replacement, or upgradation of existing RTUs at station/site level is not included in the present contract scope. Request you to please confirm.	Please refer tender condition
154.	Technical Specification CHAPTER-18(II) Up-gradation of existingSCADA Page 2 of 14 CHAPTER-18(II)	☐ The contractor will have to provide one (1) no. Laptop (RAM-16GB, SSD-1 TB with latest windows) with pre-installed all diagnostics tools/software/firmware etc. ☐ The contractor will have to provide two (2) nos. SSD external drive (2 TB) for backup of severs	We understand that this will be applicable only for the N-S corridor of Lucknow metro. Kindly confirm.	Bidder understanding is correct
155.	Technical Specification CHAPTER-18(II) Up-gradation of existingSCADA Page 6 of 14 Technical Specification	13 Standalone Gateway 19" 4U RACKMOUNTABLE INDUSTRIAL PC WITH FOLLOWING FEATURES: - Based on Intel Core I9, 14th Gen CPU or latest, Minimum Octa core processor base frequency 3 GHz. Higher no. of cores minimum 2GHz base	Industrial Grade fanless gateways are being used for the RSS communication to the SCADA OCC/BCC now a days which are more rugged and reliable. We request UPMRCL to kindly allow Industrial Grade fanless gateways instead of the PC based gateways at both the RSS. Kindly confirm.	Bidder to take approval from Engineer during detail design at their own cost.
156.	Technical Specification CHAPTER-18(II) Up-gradation of existingSCADA Page 14 of 14 Technical Specification	Acronis Cyber Protect or equivalent- Backup Advanced Server Subscription License, lifetime validity- 4 Nos	Kindly confirm the requirement of the 4 nos of back-up software. We understand the 2 are for the BCC of N-S corridors and 2 are for the BCC of E-W corridors.	Bidder to consider Individual 4 licenses for Acronis Cyber Protect or equivalent- Backup Advanced Server Subscription License, lifetime validity for N-S corridor.
157.	NIT Annexure 7B Page of 98/157	Form of Bank Guarantee for Mobilisation Advance	It is requested to add Notwithstanding clause in Advance bank guarantee format - "We are liable to pay the guarantee amount or part thereof under this Bank Guarantee only & only if you serve upon us a written claim or demand on or before..... (claim period of BG shall be 6 months beyond the expiry date of BG)". Above clause is already part of performance and bid security Bank Guarantee formats. Without this clause in BG, its difficult to get the BG from Bank.	Ok, Agreed.
158.	SCC Clause no. 10 Additional Clause Page of 112/145	Retention Money ...The contractor may, at his option, replaoe the retention amount with an unconditional BG from a scheduled commercial bank at the following stages:	It is requested to kindly provide the format for "Retention Bank Guarantee" as the same has not been specifically provided in GCC or NIT.	PBG format may be followed.
159.	GCC Clause no. 4.2.4 & SSC Clause 2 for(4.2.4) Pg No. 23/145 Page 100 /145	Guarantees and Warranties ...Within 30 days of the date of Letter of Acceptance of the Tender, the Contractor shall submit to the Employer: (i) An Undertaking in the approved format from a Parent Company the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection. (ii) A written Guarantee in the approved format from a Parent Company, the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection. (iii) A written Warrantee in the approved format from the Contractor...	As per our undemanding Submission of Parent Company Guarantee and Parent Company undertaking shall be applicable only in cases where the bidder is relying on the credentials of its Parent Company for meeting the qualification criteria (technical and/or financial). In case the bidder is independently meeting all qualification requirements without reliance on any Parent Company, submission of PCG/PCU should not be required. In view of the above, we kindly request that the relevant clause be modified to explicitly state that: "Submission of Parent Company Guarantee and Parent Company Undertaking shall be applicable only where the bidder relies on the credentials of "its Parent Company for qualirication. In cases where the bidder independently meets all qualification criteria, the requirement tar PCG/PCU shall not apply". Similar requirement is also not asked in LKRS-02 Signalling tender & also the same has been modified in Agra tender in past (reference attached as Annexure 1)	The bidders have to qualify on their own credentials. In case of JV, The parent company guarantee and warantee are applicable.
160.	GCC Clause 2.2 Page 18/145	Access to and Possession of the Site The Employer shall grant the Contractor right of access to, and / or possession of, the Site progressively for the completion of Works. Such right and possession may not be exclusive to the Contractor. The Contractor will draw/modify the schedule for completion of Works according to progressive possession/right of such sites. If the Contractor suffers delay from failure on the pan of the Employer to grant right of access to, or possession of the Site, the Contractor shall give notice to the Engineer in a period of 28 days of such occurrence. After receipt of such notice, the Engineer shall proceed to determine any extension of time to which the Contractor is entitled and shall notify the Contractor accordingly. For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account.	We would like to bring to your notice that delayed site access may lead to idling of manpower, machinery, prolonged overheads, disruption of execution sequence, and additional costs beyond the Contractor's control. Accordingly, we request the Employer to kindly consider compensation of reasonable additional costs plus profit arising solely due to delays attributable to non-availability of site, in addition to extension of time. This would ensure balanced risk allocation and facilitate efficient project	Tender condition shall prevail
161.	GCC Clause no.8.4 Page 58 /145	Extension of time for completion ...The Contractor may apply for an extension of the Time for Completion if the Work is or will be delayed either before or after the Time for Completion by any of the following causes: a) "Force Majeure" referred to in Clause 16 b) The Contractor's work held up for not being given possession of or access to the Site in accordance with the Contract c) Instruction of the Engineer to suspend the Works and the Contractor not being in default as to reasons of suspension. d) Acts or omissions of other Designated Contractors in executing Work not forming part of this Contract and on whose performance, the performance of the Contractor necessarily depends. e) Any act of prevention or Breach of Contract by the Employer and not mentioned in this Clause f) Any order of Court restraining the performance of the Contract in full or in any part thereof g) Any other event or occurrence which, according to the Employer is not due to the Contractor's failure or fault, and is beyond his control without Employer being responsible for the same. h) An Employer's Variation	In cases where delays are not attributable to the Contractor, the Contractor shall be entitled not only to Extension of Time but also for reimbursement of additional costs incurred due to such delays, along with reasonable profit that will enable contractor to submit the optimal offer for the bid It is further noted that standard forms of contract, including FIDIC, provide such cost compensation. We request you to allow contractor for cost compensation for delays which are not attributable to contractor	Tender condition shall prevail
162.	Vol 2 SCC Clause no 6 for 10.1 Page 102/145 ERTS Vol 4 Clause no. 18.5.2.5.3 Page 518/ 651	Defect Liability period Defect liability period shall be 24 months from the date of issue of taking over certificate. During the Defects Liability Period the Contractor shall provide, free of cost, competent and skilled pemonnal and maintain adequate stock of spares so as to promptly fulfil his obligations during the Defects Liability Period as laid down in GCC and Employer's Requirements. A penalty of Rs.10000/- per day in DLP period will be imposed if major equipment (as defined in the contract documents) or any complete system is not working for more than 24 Hrs. RAMS Availability Target if not met then DLP shall increase as per the availability clause (clause no. 2.6.2.- Volume-4) for maximum up to 3 years (2+1) DLP of the euiptment: if any equipment is required to be replaced/undergo major repairs due to defects/failure during the DLP then guaranty/warranty of such equipment shall be 24 months from the date commissioning of new equipment. If there is any balance period in such guaranty/warranty from the OEM at the end of DLP, such balance guaranty/warranty period shall be transferred to the Employer... AND Penalty Description For Minor Breakdown i. For more than 4 hours- Rs.2,000.00 ii. For more than 24 hours- Rs. 2,000.00 for every period of 24 hours for which the equipment is out of service after. For Major Breakdown i. For more than 2 hours- Rs.3,000.00 ii. For more than 24 houm — Rs 3,000.00 for every pedod of 24 hours for which the equipment is out of service after. For complete OCC/BCC failure i. For more than 2 hours- Rs. 10,000.00/ incident ii. For more than 2 times in a month- Additional Rs. 10,000.00/ per such occurrence For any non-compliance of UPMRC cybersecurity policy by Contractor's Engineers- Rs.50,000.00 per such occurrence.	We understand that all penalties specified under the DLP (including breakdown penalties, availability-related penalties, system failure penalties, and cybersecurity penalties) shall be considered part of the overall ceiling limit of 15% of the Contract Price. Kindly confirm.	Tender condition shall prevail

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
163.	GCC Clause no. 4.23 Page 35/ 145	Unforeseeable Physical Conditions In this Clause "physical conditions" means natural physical conditions, which the Contractor encounters at Site while executing the Works excluding climatic conditions. If, during the execution of the Works, the Contractor shall encounter physical conditions, which, in his opinion, could not have been reasonably foreseen by an experienced Contractor, the Contractor shall forthwith give written notice thereof to the Engineer and if, in the opinion of the Engineer, such conditions could not have been reasonably foreseen by an experienced Contractor, then the Engineer may certify and the Employer may pay reasonable additional cost to which the Contractor shall have been put by reason of such conditions in the following cases: a) For complying with any instruction which the Engineer may issue to the Contractor in connection therewith, and b) For any proper and reasonable measures approved by the Engineer which the Contractor may take in the absence of specific instructions from the Engineer, as a result of such conditions or obstructions being encountered. The decision of the Engineer as to the additional cost shall be final and binding.	1.In addition to cost compensation, Contractor shall be entitled to Extension of Time for delays caused by unforeseeable physical conditions. 2.Replace "Employer may pay" with "Employer will pay" reasonable additional cost, subject to Engineer's certification.	Tender condition shall prevail
164.	Vol 7 Clause 2 Page. 2 / 83	Apportionment of Fixed Lump Sum Price to Bill and to Milestones under each Bill - Payment Terms a. The whole of works including design, supply, erection/ installation, testing & commissioning is divided into bills, primarily on nature of work basis. Each bill is divided into the various items; each item further divided into various milestones activities (i.e. design & supply, Erection/Installation and Testing & Commissioning) according to their general scope of work. Contractor may raise Interim Payment Certificate (IPC) on completion of each milestone activit�� i.e., supply or Erection / Installation or Testing & Commissioning b. The fixed Lump Sum price for the whole of Works shaft be apportioned by the Tenderer among the various milestones activities, separately for foreign currency and Indian Currency. The applicable taxes and duties shaft be as per SCC Clause 24. c. The sum of amounts shown against Milestones Activities in a bill total that is to be carried forward to the Summary. The division of the respective bill totals between Indian Currency and Foreign currency shaft be shown in the said Summary. The addition of bill Summary will be carried forward to the Tender Total. d. The scope and extent of the Works are to be ascertained by reference to the Contract Documents as a whole and shaft not be limited in any manner whatsoever by the descriptions of the bill or of the Milestones under each bill, as given in the Appendices to the Pricing document.	WE understand from clause 2 of Volume 7, 100% supply amount (after deduction of retention money) will be released on completion of respective milestone as defined in each line item of BOQ & same for erection & Commissioning kindly confirm	Tender condition shall prevail
165.	Volume 7 Pricing Document Caluse 8c Page 4/ 83.	Price variation in 3.3 KV & 33kV cables It shall be governed by the IEEMA formula is enclosed as Annexure-3 to Pricing Document or latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 and 6.2 for the supply of 3.3 kV DC positive cable & Bill 1.1 & 4.1 Supply of 33kV cables.	Kindly provide the applicable/latest IEEMA Price Variation Formula for 33 kV and 3.3 kV Cables, as the same is required for proper assessment of price variation and has not been explicitly provided in the tender documents. The referenced Annexure-3 to the Pricing Document, as mentioned under the relevant clause, is not available in the tender documents. We request you to kindly share the same.	Please refer addendum 2
166.	Volume 7 Pricing Document Caluse 8d Page 5/ 83.	Price variation in 1.1 KV cables It shall be governed by the IEEMA formula enclosed in Annexure-4 to Pricing Document or latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 & 6.2 for Supply of 1.1 KV DC Negative cable.	Kindly provide the applicable/latest IEEMA Price Variation Formula for 1.1 kV DC Negative Cables, as the same is required for proper assessment of price variation and has not been explicitly provided in the tender documents. The referenced Annexure-4 to the Pricing Document, as mentioned under the relevant clause, is not available in the tender documents. We request you to kindly share the same.	Please refer addendum 2
167.	Volume 7 Pricing Document Caluse 8 Page 4/ 83.	Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause. a. Price Variation in Conductor Rail: c. Price variation in 3.3 KV & 33kV cables d. Price variation in 1.1 KV cables	It is observed that the Price Variation Clausee (PVC) have been defined for Conductor Rail & Cables only. Given the current volatility in the global market–driven by geopolitical factors and frequent fluctuations in commodity prices- the cost of major electrical equipment is highly unstable. In the absence of a PVC for other major items, bidders are exposed to significant financial risk, which may also affect project execution. Therefore, it is requested to incorporate a price variation clause in line with the applicable IEEMA formulae for all major equipments including but not limited to: 1. Dry type Transformers(Auxiliary, Traction & Inverter Transformer) 2. 33kV AIS 3. 33kV GIS 4. DC Switchgear & Rectifier (based on IEEMA LV Switchgear formula) 5. LV Cables 6. Bus Ducts 7. Battery & Battery Charger Apart from the IEEMA regulated components, wholesale Price Index(WPI) formula shall be provided for other components. This will ensure fair price adjustment and enable more accurate and competitive bidding while safeguarding both the contractor and the client from unforeseen market escalations. We request you to kindly review and incorporate the standard IEEMA based PVC & WPI formula in the tender document.	Tender condition shall prevail
168.	Volume 7 Pricing Document Caluse 8a Page 4/ 83.	Price Variation in Conductor Rail: For "Conductor Rail" (Bill No. 7.1), the price adjustment shall be linked to spot rate of aluminium quoted at London Metal Exchange (LME), and shall be as per the following formula.....	We understand that the PV formula defined Conductor Rail is also applicable for third rail accessories & stringer system. Kindly confirm	Tender condition shall prevail
169.	Vol 1 NIT ITT Appendix 1A Page 119/ 157	Schedule of Key dates	It is requested that any Liquidated Damages levied for delay in achieving interim/key milestones shall be waived or refunded, subject to the condition that the Contractor subsequently meets the revised key milestones and achieves the overall contractual completion within the stipulated timeframe.	Tender condition shall prevail
170.	Vol 2 GCC Clause 14.6 Page 86/ 145	Limitation of Liability Except as provided otherwise in these Conditions, neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any Contract or any other indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract. The total liability of the Contractor to the Employer under the Contract shall not exceed the Contract Price. Except that this Sub-clause shall not limit the liability of the Contractor: a) Under Sub-clauses 4.18, 4.19, 5.7, 8.6, and Clauses 7.10 and 7.11 b) Under any other provisions of the Contract which expressly impose a greater liability, c) In cases of fraud, wilful misconduct or illegal or unlawful acts, or d) In cases of acts or omissions of the Contractor which are contrary to the most elementary rules of diligence which a conscientious Contractor would have followed in similar circumstances.	We understand that the liability cap is 100% of the Contract Price is an absolute aggregate cap encompassing all liabilities under the Contract, including the currently carved-out clauses. (Sub-clauses 4.18, 4.19, 5.7, 8.6, Clauses 7.10, 7.11, and "any other provisions") Kindly confirm	Tender condition shall prevail
171.	Vol 2 GCC Clause 14.1 Page 84/ 145	Indemnity The Contractor shall indemnify and hold harmless the Employer, the Engineer, the Designated Contractors, Representatives and employees from and against all actions, suits, proceedings, claims, damages, losses, expenses and demands of every nature and description, by reasons of any act or omissions of the Contractor, his Representative or his employees in the execution of the Works, including professional services provided by the Contractor or in the guarding the same. These indemnification obligations shall include but not be limited to claims, damages, losses, damage prooeedings, charges and expenses which are attributable to: a) Sickness, or disease, or death of, or injury to any person; and b) Loss of, or damage to, or destruction of any property (other than the Works) including consequential loss of use; and c) Loss, damage or costs arising from the carriage of Plant, Rolling Stock and Materials and/or ownership or chartering of marine vessels by the Contractor, or any Sub-contractor of any tier. The Contractor shall also indemnify and save harmless the Employer from and against all claims and proceedings on account of infringements of patents rights, design, trademark name etc. as detailed out in clause 5.8. All sums payable by way of compensation under these conditions shall be considered reasonable compensation payable to the Employer, without reference to the actual loss or damage sustained, and whether or not any damage shall have been sustained. The decision of the Engineer as to compensation claimed shall be final and binding.	We understand that the total aggregate indemnity liability be limited to 100% of the Contract Price. Kindly confirm	Tender condition shall prevail
172.	Vol 2 GCC Clause 5.9 Page 45/ 145	Intellectual Property Rights & Royalties The Contractor shall indemnify the Employer and the Engineer from and against all claims and proceedings on account of infringement (or alleged infringement) of any patent rights, registered designs, copyright, design, trademark, trade name, know-how or other Intellectual Property Rights in respect of the Works, Contractor's Equipment, machines, work method, or Plant, or Materials, or anything whatsoever required for the Works and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall pay all traffic surcharges and other royalties, license fees, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials, machine, process, systems, work methods, or Contractor's Equipment required for the Works. The Contractor shall, in the event of infringement of Intellectual Property Rights, rectify, modify or replaoe at his own cost the Works, Plant or materials or anything whatsoever required for the Works so that infringement no more exist or in the alternative shall procure necessary rights/license so that there is no infringement of Intellectual Property Rights. AND After payment of the consideration under the Contract to Contractor all the intellectual property rights of Contractor vested in the Works, executed under the Contract, should get transferred and vested in the Employer.	We understand that all pre-existing proprietary intellectual property rights, product know-how, standard equipment designs, manufacturing technology, embedded software/firmware, standard OEM products/platforms and related patents/copyrights/trademarks of the Contractor/OEM shall remain the exclusive property of the Contractor/OEM, while the Employer shall retain a perpetual license/right to use the supplied system and related documents for operation, maintenance and modification of the Project. Kindly confirm our understanding	Tender condition shall prevail
173.	Vol 4 ERTS Clause 1.5 Page 15/ 651	MAKE IN INDIA 1.5.1.1 Minimum Local content for the subject tender is 60%+ and to ensure compliance of items as listed in the Ministry of Housing and Urban Affairs order no. F. No. K-14011/10/2019 -UT-V dated 1 January, 2021. List of items is as below: i. EHV, HV, LV and Control Cables ii. EHV, HV, LV Switchgears iii. Vacuum Insulated Switchgear iv. Air Insulated Switchgear v. Battery Chargers vi. Batteries vii. Tranformers viii. Fire protection System ix. Contol Relay Panel x. Condutor wires	In line with the clause 1.5.1.1 ii. LV Switchgears will be considered for item defined in clause 1.5.1.1 can be procured from outside India also subjected to maintain the minimum 60% criteria of local content. Kindly confirm the understanding. In case of item defined 1.5.1.1 to be procure from India only, then the following to be clarified: -DC Switchgear are rated at 750V DC & considered as a LV Switchgear & OEM of DC switchgear in Indian Market is limited. Henceforth, we understand that LV switchgear defined 1.5.1.1 ii is limited to procurement of ACDB/DCDB or smaller distribution panels only. Therefore, we understand the DC Switchgear can be procured from outside India.	Tender condition shall prevail
174.	Vol 2 GCC Clause 11.1.3 Page 66/ 145	Adjustment in Contract price shall be done if a "Price Variation Fomula" is given in the Special Conditions of Contract otherwise it will be a fixed price contract.	We would like to bring to your notice that it is not feasible to perform traction simulation study at bid stage to ascertain the number of TSS & inverters, size & rating of equipment's in the absence of complete inputs like rolling stock parameters, Traction & auxiliary loads, etc. We understand that at bid stage, specification of equipment shall be considered as provided in the tender specification to keep all bidders at par. Therefore, any change in number of TSS & Inverters and rating of equipment's during execution shall be considered as Variation otherwise it will lead to a substantial risk for contractor in case of any change in rating of equipment & number of TSS and Inverters. Kindly confirm our understanding.	Tender condition shall prevail
175.	Vol 4 ERTS Clause 12.16.6.1 Page 236 /651	The LKE(02)-01 Contractor will have to study the General Layout of the AMS & Control Room Building, shown in the RSS/AMS Layout drawing and propose any changes to the Employer during execution stage.	The RSS layout plan drawing with plot dimensions & area and RSS building elevation and plans drawing are missing from tender. These drawings and information (RSS plot dimension and layout with building plan and elevation) are required for estimating the Civil BOQ for RSS.	Please refer addendum 2

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176.	Vol 5 Tender Drawing Page 1	RSS Layout plan and plot size & Building layout plan & elevations and building dimension not provided in tender.	It is mentioned in tender drawings that data not available for overall layout of Vasant Kunj RSS & Elevation of RSS/AMS building. This data is required for calculating the Civil BOQ for RSS.	Please refer addendum 2																																																																			
177.	Vol 4 ERTS Clause 2.5.5 Page 23/651	In case of loss of one rectifier transformer (N-1/2 scenario of TSS) in any of the TSS, there shall not be any impact on the Train normal operation as per the design year requirements.	We understand that the design year for N-1/2 Scenario to be considered as 2051. Kindly confirm.	Tender condition shall prevail																																																																			
178.	Vol 4 ERTS Clause 2.2 Page 17 /651	2.2 Train Operation Data:	We understand that the design year for Traction Simulation to be considered as 2055. Kindly confirm.	Tender condition shall prevail																																																																			
179.	Vol 4 ERTS Clause 15.18.1.5.2 Page 434/651	The reversible converter units shall be designed to work in parallel/ replace the diode rectifier units in order to supply traction system and to recover the braking energov. <table><tr><th>E-W Corridor Section</th><th>Items</th><th>2027</th><th>2030</th><th>2041</th><th>2051</th><th>2055</th></tr><tr><td rowspan="4">Charbagh to Thakurganj</td><td>Cars/Train</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td>Headway (sec)</td><td>195</td><td>168</td><td>138</td><td>129</td><td>129</td></tr><tr><td>Trains/hr</td><td>18</td><td>21</td><td>26</td><td>27</td><td>27</td></tr><tr><td>PHPDT</td><td>17945</td><td>20829</td><td>25357</td><td>27126</td><td>27126</td></tr><tr><td>Section</td><td>Items</td><td>2027</td><td>2030</td><td>2041</td><td>2051</td><td>2055</td></tr></table><table><tr><td>Thakurganj to Vasantkunj</td><td>Cars/Train</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td></td><td>Headway (sec)</td><td>390</td><td>336</td><td>276</td><td>258</td><td>258</td></tr><tr><td></td><td>Trains/hr</td><td>9</td><td>10</td><td>13</td><td>14</td><td>14</td></tr><tr><td></td><td>PHPDT</td><td>8972</td><td>10414</td><td>12678</td><td>13563</td><td>13563</td></tr></table>	E-W Corridor Section	Items	2027	2030	2041	2051	2055	Charbagh to Thakurganj	Cars/Train	3	3	3	3	3	Headway (sec)	195	168	138	129	129	Trains/hr	18	21	26	27	27	PHPDT	17945	20829	25357	27126	27126	Section	Items	2027	2030	2041	2051	2055	Thakurganj to Vasantkunj	Cars/Train	3	3	3	3	3		Headway (sec)	390	336	276	258	258		Trains/hr	9	10	13	14	14		PHPDT	8972	10414	12678	13563	13563	IGBT based inverter along with transformer are used to recover the braking energy generated in the traction system. Henceforth, inverter commonly is not used to supply the power to traction load. Therefore, it is requested to delete the requirement defined in 15.18.1.5.2 that is "replace the diode rectifier units in order to supply traction system"	Tender condition shall prevail
E-W Corridor Section	Items	2027	2030	2041	2051	2055																																																																	
Charbagh to Thakurganj	Cars/Train	3	3	3	3	3																																																																	
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180.	Vol 4 ERTS Clause 15.18.1.7.9 Page 436/651	f) Protection Degree: IP3X	Inverter systems require efficient heat dissipation due to losses in power electronics (IGBTs). An IP21 enclosure allows improved natural ventilation, ensuring better thermal performance and enhancing equipment reliability and lifespan. Standard inverter designs for traction and industrial applications commonly adopt IP21/IP20 enclosures as inverter is designed for indoor installation, as specified in the tender In view of the above, we kindly request you to confirm acceptance of IP21 protection degree for the inverter, subject to compliance with all other safety, operational, and performance requirements specified in the tender.	Tender condition shall prevail																																																																			
181.	Vol 4 ERTS Clause 15.18.1.9.3d Page 437/651	The noise level at the rated value for the inverter shall be less than 75dB at a distance of 1meter with the fans in operation.	Noise levels vary with loading and power electronic switching components, and achieving a constant 75 dB under all operating conditions is not technically feasible without additional acoustic enclosures, which may adversely affect ventilation and thermal performance, thereby impacting efficiency and reliability; the proposed range reflects typical industry performance for IGBT-based traction inverters operating under variable load cycles while maintaining safe and compliant operation. Therefore we kindly request acceptance of a noise level range of 75–85 dB at 1 meter for the inverter system	Tender condition shall prevail																																																																			
182.	Vol 4 ERTS Clause 15.18.1.15.1 Page 439/651 & Vol 4 ERTS Clause 15.18.1.10.2 Page 437/651	7. Overload duty 150% 2 hours; 300% 1 minute & The rating at 50oC shall be 1.0 MW for continuous operation and the overloading capability shall be 150% for two (2) hours and 300% for one (1) minute of continuous operation according to Class VI of IEC 60146. The inverter will have a voltage detection type with constant or adjustable current and voltage features. The inverter shall have voltage and current detections sensors to regulate the current during inverting mode. The inverter shall have a rated voltage at rated continuous load. The continuous rating shall be defined as the output that can be delivered continuously at rated full load voltage.	Inverter systems for traction applications are typically designed and rated based on dynamic load cycles and thermal limits rather than fixed overload durations; the specified overload criteria are generally applicable to rectifier/transformer equipment and may not be technically suitable or achievable for IGBT-based inverter systems, where performance is governed by semiconductor limits, cooling design, and real-time operating conditions such as regenerative braking patterns; adopting standard manufacturer-defined overload characteristics ensures optimal performance, reliability, and compliance with IEC practices without overdesigning the system. Therefore we kindly request acceptance of overload duty based on simulation study and load cycle capacity requirements.	Tender condition shall prevail																																																																			
183.	Vol 2 GCC Clause 16.11d Page 71/145	Delayed Payment The Employer shall pay the amount certified in the final payment certificate within 56 days from the date of issue of certificate.	Delayed payment clause of interest for late payment is not avilable in GCC or NIT. Hence, request you to add an appropriate interest clause to address potential delays in payment beyond 56 days to Contractor.	Tender condition shall prevail																																																																			
184.	Vol 1 Clause 1.3 of NIT Page 5/157	SOURCE OF FUNDS: This tender is likely to be financed from Bilateral/ Multilateral financing institution or shall be financed through an equity participation by the Government of India and Government of Uttar Pradesh and other appropriate means. The procurement guidelines of the funding agency (Bilateral/Multilateral financing institution) shall be followed.	The mentioned clause does not clearly specify the exact funding agency involved. kindly request you to provide the deatils of the funding agency.	Tender condition shall prevail																																																																			
185.	Vol 2 GCC Clause 10.1 Page 63/145	The expiry of Defect Liability Period would not absolve the Contractor from any liability under the Law and Contract arising from any hidden / latent defect in the Works / Section executed under the Contract by the Contractor. The Employer would be entitled to recover from the Contractor any compensation / damages / loss arising from such hidden / latent defect in the Works executed by the Contractor.	This clause creates an open-ended and unlimited liability period to the contractor and makes it impossible for the Contractor to assess risk and price the bid accordingly. Henceforth, it is requested to limit the liability of contractor, Employer has to communicate any hidden/latent defect within 28 days after completion of DLP period. Kindly confirm	Tender condition shall prevail																																																																			
186.	Vol 2 GCC Clause 11.1.1c PAGE 66/145	Any taxes, duties, levies cess, which are required / may be required to be paid by the Employer in the fulfilment of the tender condition including on reverse charge basis should also be included by the tenderer in the Contract Price	We understand that in case of foreign suppliers, the applicable GST under the Reverse Charge Mechanism (RCM) shall be deposited by the Employer directly with the appropriate authority in accordance with the provisions of the IGST Act. Kindly confirm our understanding.	Tender condition shall prevail																																																																			
187.	Vol 4 ERTS Clause 15.18.1.5.2 Page 434/651	The Contractor shall effect and maintain Professional Indemnity Insurance, preferably in the name of UPMRC, for the amount in Indian Rupees stipulated in Appendix to the Form of Tender in respect of any design of the Works to be carried out by, or on behalf of the Contractor. This insurance, which shall ensure the Contractor's liability by reason of professional negligence and errors in the design of the Works, shall be valid from the date of commencement of Works, until 5 years after the date of issue of Performance Certificate. Alternatively the Contractor shall renew the insurance before the expiry of the Yearly Insurance in such a way that the entire validity period is covered. & <table><tr><td>vi</td><td>Amount of Professional Indemnity Insurance (PII)</td><td>Clause 15.1 and 15.5 of the GCC</td><td>of the contract value against BOQ in respect of "design and construct" with AOY (any one year) limit of 2 brackets. In a year, in the Professional Indemnity Insurance Policy the deductible amount shall not be more than 5% of AOW limit. PI Policy shall be obtained within four weeks from date of commencement" and shall be valid for five years after date of issue of Performance Certificate. Whenever the contractor submits policy for shorter period annual renewable policy, the same, shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The contractor's submission of such</td></tr></table>	vi	Amount of Professional Indemnity Insurance (PII)	Clause 15.1 and 15.5 of the GCC	of the contract value against BOQ in respect of "design and construct" with AOY (any one year) limit of 2 brackets. In a year, in the Professional Indemnity Insurance Policy the deductible amount shall not be more than 5% of AOW limit. PI Policy shall be obtained within four weeks from date of commencement" and shall be valid for five years after date of issue of Performance Certificate. Whenever the contractor submits policy for shorter period annual renewable policy, the same, shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The contractor's submission of such	We understand from both the clauses that the amount of professional indemnity insurance is 5% of Contract Price. Kindly confirm	Please refer Annexure 2																																																															
vi	Amount of Professional Indemnity Insurance (PII)	Clause 15.1 and 15.5 of the GCC	of the contract value against BOQ in respect of "design and construct" with AOY (any one year) limit of 2 brackets. In a year, in the Professional Indemnity Insurance Policy the deductible amount shall not be more than 5% of AOW limit. PI Policy shall be obtained within four weeks from date of commencement" and shall be valid for five years after date of issue of Performance Certificate. Whenever the contractor submits policy for shorter period annual renewable policy, the same, shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The contractor's submission of such																																																																				
188.	Vol4 ERTS Clause 14.2.4.1 Table 14.3 Page 279/651 & Vol 4 ERTS Table 14.4 Page 280/651 & Vol4 ERTS Clause 14.2.5.4.8 Page 285/651	Table 14.3 Point 18 Protection Degree - IP 5X & Table 14.4 Point 13 Protection Degree - IP 3X & Clause 14.2.5.4.8 - The degree of protection shall be IP 5X or higher.	f) Protection Degree: IP3X	Tender condition shall prevail																																																																			
189.	Vol 4 ERTS Clause 14.2.5.4.6.d Page 285/651	All terminals should be provided with suitable cadmium plated and passivated high tensile steel hard wires facilitate cables termination.	Nut bolt & washer shall be plated with Zinc which is corrosion resistant . Kindly accept the same	Tender condition shall prevail																																																																			
190.	Vol 4 ERTS Clause 14.2.5.2.1 Page 281 /651	The cubicles shall be of dust and vermin proof cabinet sheet metal. Structure made of Alu-zinc/GI material to reduce the corrosion effect. However, the GI switchgear cubicle shall be of proven design. Front door & rear cover can be of CRCA sheet with powder coating. All cubicles shall be of same type. All non-welded assemblies shall be assembled by means of bolts and nuts/rivets with mandatory use of lock-washers.	We understand that the complete panel with CRCA sheet with powder coating will be accepted since CRCA have following advantages: a) Having robust surface finish, b) Having lower strain hardening coefficient and improved planar anisotropy (improved drawability). c) Lesser corrosion as CRCA sheet steel is powder coated after all the punching/cutouts are done. d)CRCA powder-coated sheet steel having satisfactory performance across several installations in India. Kindly confirm	Tender condition shall prevail																																																																			

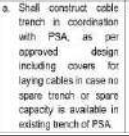
Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
191.	Vol3 ERGS Clause 1.12.4 Page 19/195	Environmental and Climatic Data: Relative Humidity = Nominal 70% and Max 100% (Non Condensing)	We understand that required maximum average relative humidity <= 70% for 24 hour basis. Kindly confirm our understanding	Tender condition shall prevail
192.	Vol 5 Tender drawing Page 16/87	Drawing No- AGCC01-11718A-TDR-RSS-TR-PWR-71571 CT burden for various feeders	We understand CT burden for various type of Current transformers will be designed as per actual loads since for smaller ratio of current transformer, 20VA may not be feasible to achieve. Henceforth, it is requested to accept the CT burden as per actual loading conditions.	Please refer addendum 2
193.	Vol 4 ERTS Clause 14.2.16.4 Page 303/651	The equipment installed shall offer all necessary facilities for equipping and connecting the equipments sections to follow, without entailing any shut down of equipment already in service.	We understand in supplied 33kV Switchgear, provisions needs to be provided for future augmentation. However, for augmentation of busbar, shutdown will be required although augmentation work to be carried out under the supervision of OEM. Kindly confirm	Tender condition shall prevail
194.	Vol 4 ERTS Clause 14.2.16.11 Page 304/651	A relay and instrument compartment shall be located at the front of each switchgear unit and shall be provided with a hinged door for access to the internal wiring and terminals. Gaskets shall be used to provide close sealing. The height of the instrument panel above floor level shall not exceed 2,000mm unless otherwise reviewed without objection by the Engineer who may require the Contractor to provide, at its own cost, suitable means for easy access to the instrument panel	We understand height of operating equipments mounted on LV Chamber should not be more than 2000mm. Although overall height of LV compartment or 33kV Switchgear panel could be more as per OEM design. Kindly confirm	Tender condition shall prevail
195.	Vol 4 ERTS Clause 14.2.17.2.7 Page 305/651	The electrical tripping and closing devices shall be operated switchgear enclosure, over a DC voltage range as follows: satisfactorily, with a maximum temperature of 55°C inside the 33kV } Closing solenoids 80 to 120% of rated voltage } Spring charging motor 80 to 120% of rated voltage } Closing release coil 80 to 120% of rated voltage } Shunt trip release coil 70 to 120% of rated voltage	We understand Environmental conditions defined in Clause 1.12.4 Requirements for Class B, although the temperature rise inside the enclosure shall be as per latest IEC 62771-100/200. As per IEC 62271, the limits are as below :- * Closing solenoids 85 to 110% of rated voltage, * Spring charging motor 85 to 110% of rated voltage, * Closing release coil 85 to 110% of rated voltage, * Shunt trip release coil 70 to 110% of rated voltage, Request you to kindly modify the requirement.	Tender condition shall prevail
196.	Vol4 ERTS Clause 14.2.17.5.7 Page 306/651	When there is provision for isolation of sections of cable between two "either-or" interlocked circuit breakers, a key-operated over-ride shall be provided to permit both circuit breakers to be closed at the same time provided that the circuit between them is broken. It shall not be possible to restore the connection without tripping one of the two circuit breakers and releasing the key.	Such key operated override feature is not possible in GIS. Kindly check and propose suitable amendments.	Tender condition shall prevail
197.	Vol 4 ERTS Clause 14.2.17.12.7 Page 308/651	Secondary connection wirings shall have a minimum size of 4mm ² copper conductors.	Secondary connection wiring of CT & other indication & tripping wiring shall be of size 2.5 sq.mm which is sufficient and as per standard metro project requirements. Request you to accept the same.	Tender condition shall prevail
198.	Vol 4 ERTS Clause 14.2.17.14.1 Page 309/651	Painting should be suitable for polluted atmosphere and has to comply with IEC 60 721-2-5 standard	Painting shall be as per manufacturer's standard procedure of powder coating via 7 tank. Paint shade shall be RAL 7035. Please accept	Tender condition shall prevail
199.	Vol 4 ERTS Clause 14.2.17.16.1 Page 309/651	g) Semaphore indicators	Semaphore indicators are not required, since circuit breaker (CB) status indications, along with the mimic, are being already provided on the panel front as per Clause 14.2.17.2.10. Kindly accept the same.	Tender condition shall prevail
200.	Vol 4 ERTS Clause 14.2.19.3.1 Page 312/651	The protection relays shall comply to IEC 60255. CT secondary terminals shall be shorted automatically when the relay is withdrawn.	As per clause no:14.2.19.3.11, there shall be RTB which can take care of CT shorting externally. Please confirm our understanding to have RTB for shorting of CT terminals.	Tender condition shall prevail
201.	Vol 4 ERTS Clause 14.2.19.3.1 Page 312/651	The protection relays shall comply to IEC 60255. CT secondary terminals shall be shorted automatically when the relay is withdrawn. The relays comprising of PCU (Protection and control unit) shall be in full compatibility with the RTU (remote terminal unit) of SCADA and shall be capable of providing single point monitoring, control, logging and protection for the system. Main and backup protection relay shall be separate.	We understand that the feeder protection relay and differential relay shall be separate and will operate as main and backup relays, as applicable. Kindly confirm	Tender condition shall prevail
202.	Vol 4 ERTS Clause 14.2.19.3.6 Page 312/651	Timers shall be of solid state type. Time delay in terms of milliseconds obtained by the external capacitor resistor combination shall be avoided.	Timers could be the part of the Numerical relays. Please confirm.	Tender condition shall prevail
203.	Vol 4 ERTS Clause 14.2.20 Page 315/651	METERING	As per our understanding, Energy meter shall be considered for Incomer feeder from RSS while MFMs shall be considered for transformer outgoing feeders. Kindly confirm	Please refer addendum 2
204.	Vol 4 ERTS Clause 14.2.20 c Page 315/651	Energy Meter/Multi Function Meter with metering accuracy class 0.2S shall be provided in each transformer feeder including incomer feeder at RSS 33 kV Switchgear) as per the latest guideline of electricity tariff rules and regulation and compatible with redundant communication protocol of IEC 61850, RS485 (Modbus) and IEC 103 etc. for SCADA Integration with redundant fibre/RS485 Ports	For Energy meter/Multi function meter, only Modbus RS 485 is applicable and IEC 61850 is not applicable. Kindly amend the requirements accordingly.	Tender condition shall prevail
205.	Vol 4 ERTS Clause 14.2.22 Page 319/651	Table 14.9: Test Sheet for 33 kV Vacuum CB Radio interference voltage tests	Radio interference voltage test is applicable for switchgear above 245 K V. Hence the same is not applicable for 33kV GIS. Kindly confirm acceptance	Tender documents & relevant standards shall be applicable
206.	Vol 4 ERTS Clause 14.2.22 Page 319/651	Table 14.9: Test Sheet for 33 kV Vacuum CB Switching of shunt reactors and motors	Since switching of shunt reactors and motors is not applicable, the corresponding tests are not envisaged as per respective IEC. Kindly confirm	Tender documents & relevant standards shall be applicable
207.	Vol 4 ERTS Clause 14.2.22 Page 319/651	Table 14.9: Test Sheet for 33 kV Vacuum CB Switching of shunt reactors and motors Tightness test Lightning and switching impulse test Partial Discharge Test	Request to delete the following test from the routine & acceptance tests, as it falls under type test. 1. Switching of shunt reactors and motors 2. Tightness test 3. Lightning and switching impulse test 4. Partial Discharge Test	Tender condition shall prevail
208.	Vol 4 ERTS Clause 14.2.22 Page 319/651	Table 14.9: Test Sheet for 33 kV Vacuum CB 1) Breaker Residual Voltage Test (Lightning and Switching Impulses) Long term stability under continuous operation Repetitive Charge transfer withstand Heat dissipation behaviour verification Internal Grading Component (Chopped) Lightning impulse voltage withstand test on primary terminals Accuracy test Mechanical Impact test Transmitted Overvoltage test Measurement of Capacitance and Dielectric dissipation factor Pressure Test	We understand that routine/type test to be carried out on 33kV Vacuum CB in accordance with IEC 62271. The following test are not applicable as per IEC 62271. * Residual Voltage Test (Lightning and Switching Impulses) * Long term stability under continuous operation * Repetitive Charge transfer withstand * Heat dissipation behaviour verification * Internal Grading Component * (Chopped) Lightning impulse voltage withstand test on primary terminals * Accuracy test * Mechanical Impact test * Transmitted Overvoltage test * Measurement of Capacitance and Dielectric dissipation factor * Pressure Test Therefore, It is requested to delete the above mentioned list of test for 33kV Vacuum CB.	Tender condition shall prevail
209.	Vol 4 ERTS Clause 14.2.22 Page 319/651	Table 14.9: Test Sheet for 33 kV Vacuum CB 2) Complete Switchgear Relays settings and meter calibration Corrosion Test Fire Hazard test	We understand that routine/type test to be carried out on 33kV Switchgear in accordance with IEC 62271. The following test are not applicable as per IEC 62271. * Relays settings and meter calibration * Corrosion Test * Fire Hazard test Therefore, It is requested to delete the above mentioned list of test for 33kV Switchgear.	Tender condition shall prevail
210.	General	Surge Arrestor requirement	Kindly confirm if there is requirement of Line Surge Arrestor for incoming/ring/transformer feeder	Contractor to perform detailed design and obtain approval of Engineer during detail design stage at own cost. No extra cost shall be paid.
211.	Vol 4 ERTS Clause 2.6.3. SERVICE LIFE Clause 18.17.6.1 Usable Service Life Page 29/651 Page 577/651	2.6.3 All components, materials, software and other support required to repair and service all System shall be available for at least 30 years from the Employer's Taking over of the Works or Section & 18.17.6.1 The SCADA software shall be supplied with perpetual license, and the usable service life of SCADA software and it's enabling IT environment (OS, Database Software and any other software required for installation of SCADA software) shall be minimum 15 years from date of supply. All materials and equipment to be supplied shall be of a proven design and the major core components of the SCADA system shall have a Service Life of at least fifteen years.	We understand that SCADA System includes SCADA Software along with its enabling IT environment (OS, Database Software and any other software required for installation of SCADA software) & respective hardware life cycle will be 15 years from date of Supply as per clause 18.17.6.2. We understand that service life of 30 years defined in clause 2.6.3 is applicable to complete System excluding SCADA system as defined in clause 18.17.6.1. Kindly confirm	Tender condition shall prevail

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
212.	Vol 4 ERTS Clause 18.17.6 Usable Service Life Page 577/651	18.17.6.1 The SCADA software shall be supplied with perpetual license, and the usable service life of SCADA software and it's enabling IT environment (OS, Database Software and any other software required for installation of SCADA software) shall be minimum 15 years from date of supply. All materials and equipment to be supplied shall be of a proven design and the major core components of the SCADA system shall have a Service Life of at least fifteen years.	IT hardware and software used in SCADA systems are subject to rapid technological obsolescence and OEM end-of-support policies. Further, as per Indian Railways/RDSO codal provisions, the average codal life of servers and IT hardware is typically 10 years.(Annexure 2 attached) However, IT hardware/software platforms such as operating systems, databases, servers, and related software are subject to OEM lifecycle limitations, cybersecurity updates, and technological obsolescence. Accordingly, we request you to revise the minimum usable service life requirement for the SCADA software and its enabling IT environment to 10 years from date of Supply.	Tender condition shall prevail
213.	Vol 4 ERTS Clause 18.6.5.SCADA general Architecture Page 525/651	The SCADA system at the integrated control centres shall communicate and control all RTUs along the corridor.The SCADA system at the integrated control centres shall consist of dedicated redundant Hot-Standby SCADA Servers for each corridors (i.e N-S corridor & E-W corridor)	It is requested to please clarify whether independent dedicated SCADA Servers and Database Servers are mandatory for each corridor (N-S Corridor & E-W Corridor) at OCC, or Combined redundant server architecture is expected by UPMCL for both corridor.	Please refer clause no. 18.5 of chapter 18 volume 4(ERTS)
214.	Vol 4 ERTS Clause 3.1.12 INTERFACE WITH SIGNALING CONTRACTOR-Point 10 - ETS Page 77/651	b. Shall interface with Signaling Contractor for integrating ETS to signaling plan for stopping the train when ETS is pressed. Also, shall provide a signal in the form of potential free contact from ETS for stopping the train entry to the affected section of third rail during any outage.	It is requested to please clarify whether the interface with the Signaling Contractor for ETS signal exchange shall be through hardwired signals at station level only.	Please refer addendum 2
215.	Vol 4 ERTS Clause 15.3.12.4.6 Page 371/651	All the DC relays shall be communicated with the Ethernet switch installed in NRP panel in Star topology configuration with redundant path through PRP (Parallel Redundancy Protocol) over IEC 61850 protocol.	It is requested to accept the communication architecture based on HSR (High-availability Seamless Redundancy) over IEC 61850 for DC relays as an alternative to the specified PRP-based architecture. . Kindly confirm	Tender condition shall prevail
216.	Vol 4 ERTS Clause 18.6.5.11 Page 527/651	Four Operator Workstations each with dual 24" LED monitors shall be provided in OCC theatre room only.	We understand that only 4 operator worstations for Phase 1B & phase 1A will be provided only. Kindly confirm	Please refer tender document & tender drawings
217.	Vol 4 ERTS Clause 18.6.5.14 Page 527/651	One no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software is installed in each existing RSS of N-S corridor and one no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software to be installed at Vasantkunj depot RSS/AMS of E-W corridor by the contractor with facility of its Remote Desktop at OCC & BCC	Please clarify whether the scope of this contract is limited only to the supply and installation of Disturbance Recorder (DR) workstations for each existing RSS of the N-S Corridor, without any modification to the existing relays and RTUs supplied by another vendor. Request you to please share the existing RSS architecture for better understanding.	Please refer tender document & annexure
218.	Vol 4 ERTS Clause 18.6.5.14 Page 527/651	One no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software is installed in each existing RSS of N-S corridor and one no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software to be installed at Vasantkunj depot RSS/AMS of E-W corridor by the contractor with facility of its Remote Desktop at OCC & BCC	We understand that Disturbance Recorder (DR) workstation proposed at Vasantkunj Depot RSS/AMS for the E-W Corridor shall be accessed at OCC & BCC through Remote Desktop only. Kindly confirm	Bidder understanding is correct
219.	Vol 4 ERTS Clause 18.6.5.21 Page 528/651	SCADA system shall support multi-protocol environment i.e. IEC 60870-5-101, IEC 60870-5-103, IEC 60870-5-104, MODBUS and OPC DA/UA protocols.	OPC DA is a legacy protocol and not recommended for use due to cybersecurity and compatibility limitations.Therefore, recommend to use OPC UA only. Kindly confirm.	Agreed
220.	Vol 4 ERTS Clause 18.6.5.19 Page 528/651	SCADA server and SCADA software shall be sized and suitably licensed for the control & monitoring requirement of EAST-West Corridor & North south corridor and its future expansion shall be included. The SCADA software shall be supplied with the license of minimum 70 RTUs and 45000 I/Os shall be included.	Please clarify whether separate SCADA software licenses are required for East-West Corridor and North-South Corridor, each with a capacity of 70 RTUs and 45,000 I/Os, or whether a single common SCADA license covering both corridors with combined capacity shall be considered acceptable at OCC.	Please refer Tender documents
221.	Vol 4 ERTS Clause 1 of Chapter 18 (II) Page 621/651	CHAPTER-18(II) Up-gradation of existing SCADA System (Make-ABB) installed at BCC server room, TPNR RSS & MSPA RSS of Lucknow Metro- The server software license shall be at least 25000 database I/O's and 4 Lines.	We understand that the SCADA Software Server License with 25,000 I/O is applicable only for the upgradation of the N-S Corridor BCC and not for the upgradation of RSS. Kindly confirm Also please clarify the meaning of 4 lines?	Bidder understanding is correct.
222.	Vol 4 ERTS Chapter 18 & Vol 5 Tender drawings	SCADA Architecture - Tender Drawing's	Request you to kindly share the existing system architecture of the N-S Corridor for the upgradation scope of OCC, BCC, and RSS for better understanding and clarity of the system.	Please refer Addendum 4
223.	Vol 4 ERTS Clause 2 (A) Table point 13 of Chapter 18 (II) Page 626/651	Standalone Gateway - 19" 4U RACKMOUNTABLE INDUSTRIAL PC WITH FOLLOWING FEATURES: - Based on Intel Core I9, 14th Gen CPU or latest, Minimum Octa core processor base frequency 3 GHz. Higher no. of cores minimum 2GHz base 64GB DDR5 Memory. 2*1TB SATA SSD. 1*DVD-Drive. 2*10/100/1000 mbps LAN Ethernet Ports onboard. 4*USB, 2*Serial, 1*VGA, 1*DVI & 1*HDMI Port onboard. 1*USB Keyboard and Optical Mouse. 1*TPM Module. 1*Dual Power Supply.	RTU-based gateway architecture minimizes dependency on operating systems and IT hardware platforms, which are subject to rapid technological obsolescence and OEM lifecycle limitations, thereby providing better long-term reliability and maintainability. Request you to kindly confirm whether RTU-based redundant gateway architecture is acceptable in place of PC-based gateway architecture.	Tender condition shall prevail
224.	Vol 7 Pricing document Clause 10.11.2 Page 72/83	Server Rack Upgradation of SCADA at UPMRCL BCC Upgrade One Set of this item shall essentially include but not limited to the following: o 19" Rack Mountable Server for SAS	We understand that new Server Racks for BCC and RSS upgradation for NS Corridor is not required to be supplied under this contract as per Explanation notes (BOQ Bill No. 9.3). Kindly confirm	Tender condition shall prevail
225.	Vol 4 ERTS Clause 18.5 Scope of work (O) Page 515/651	Comprehensive AMC of Complete SCADA System for both corridor (N-S & E-W) for 3 Years (after DLP period)	As per Clause No. 18.5.2.6.2, the Comprehensive AMC scope includes only the spares and T&P to be maintained by the contractor at Lucknow Metro site. Accordingly, our understanding is that any equipment/items/spares other than those specified under Clause No. 18.5.2.6.2 shall not be covered under Comprehensive Maintenance and shall be deal separately. Further, for such excluded items, the contractor's team shall only provide preliminary checking/troubleshooting support and submit the observation/report for further necessary action. Request you to please confirm our understanding.	Tender condition shall prevail
226.	Vol 4 ERTS Clause 18.14.2.8.3 LVDS Page 571/651	Signalling contractor shall allocate and provide separate/dedicated Dual Redundant Display Wall Controllers for the LVDS cubes of Traction SCADA system	As per our understanding, Seprate LVDS dedicated Redundant controller shall provided by signalling Contractor for both corridor EW and NS.	Bidder understanding is correct
227.	Vol4 ERTS Clause 3.1.12 INTERFACE WITH SIGNALING CONTRACTOR Page 76/651	Exchange information between ATS-SCADA For section charge and discharge status	As per the Interface Matrix, no communication protocol has been specified for exchange of information between ATS and SCADA systems for Section Charge/Discharge status with the Signalling system. In this regard, it is requested to kindly specify and permit only open standard communication protocols such as IEC 60870-5-104, Modbus TCP/IP, or OPC UA for interoperability, cybersecurity compliance, and seamless integration between systems. Further, OPC DA is not recommended due to cybersecurity concerns and legacy architecture limitations. Similarly, usage of proprietary protocols is also not recommended considering long-term maintainability, interoperability, and multi-vendor integration requirements.	Please Refer Addendum 2
228.	Vol 4 ERTS Clause 18.4.1.17 Page 514/651	The integration of East West corridor will involve updation of base line in the existing SCMS-SCADA software if required. The contractor shall interface with the track contractor to ensure satisfactory track conductance as per EN standard.	With reference to the stated requirement, request you to kindly clarify the scope related to "updation of baseline in the existing SCADA software" for integration of the East-West Corridor. In this regard, we understand that the existing N-S Corridor is based on a 25 kV OHE SCADA system, whereas SCMS is generally associated with DC/Third Rail traction systems. Accordingly, it appears that there is no existing SCMS functionality or integration available in the present N-S Corridor system. Hence, request you to kindly clarify the requirement and applicability of SCMS SCADA baseline updation under the present scope.	SCMS is required for 750V DC system
229.	Vol 4 ERTS Clause 18.19.10 Page 583/651	Network Management System	With reference to Clause No. 18.19.10 related to the Network Management System (NMS), request you to kindly provide details of all switches of NS Corridor required to be integrated with the NMS of existing RSS/BCC. Further, please share the quantity of switches, existing RSS network architecture, and details/number of switches to be integrated with the NMS. This clarification is required because switches of different make/OEM supplied under the upgradation scope may not support the required features and configuration compatibility as specified under TS Clause No. 18.19.10.	Please refer addendum 4
230.	Vol 7 Pricing Document - Bill of Quantities Clause 10.11.2 (1) Page 72/83 & Vol4 ERTS CHAPTER-18(II) TNPR RSS/MSPA RSS/BCC Page 630/651	Upgradation of SCADA at UPMRCL BCC Upgrade 19" Rack Mountable DR Server	As per Clause 10.11.2(1) of the Financial Package (Pricing Document – Bill of Quantities), a 19" rack-mountable DR Server has been specified under the scope of supply. However, upon review of the (C) Technical Specification of BCC, it is understood that no dedicated DR Server has been envisaged. Instead, only Network Management System (NMS) has been requested under the tender scope (Reference: Page 630/651). In view of the above, kindly clarify whether the requirement of the 19" rack-mountable DR Server mentioned in the Financial Package is applicable, or whether only the NMS needs to be considered for compliance and pricing. Kindly confirm the requirement.	Tender condition shall prevail

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
248.	Vol 7 Pricing Document - Bill of Quantities, clause 10.5 item A.1.1 Page 17/83	Explanation (BOQ Bill Nos. 5.1 –ASS) GIS Type for Underground Station ASS Supply and erection including testing and commissioning of Bus PT Panel Supply: as per specifications & drawings completion of Job as per specifications and drawings	Kindly provide Protection requirement for Bus PT Panel	Please refer tender documents & addendum 2
249.	Volume 4: ERTS, clause 12.1.2 Page 162/651	12.1.2 33 kV HIGH VOLTAGE BAYS (RSS)	Indoor surge arrester for 33kV AIS panel specification is not mentioned in tender document. It is requested to provide the same	Contractor to perform detailed design and obtain approval of Engineer during detail design stage at own cost. No extra cost shall be paid.
250.	Volume 4: ERTS, clause 15.6.1.1 Page 396/651	OVER VOLTAGE PROTECTION DEVICE This specification applies to indoor type negative earthing equipment ("Short Circuiting Device" or "OVPD") for 750 V DC system to be installed in the metro railway substation for control and protection against impermissible touch voltage caused by rail potential due to train operation or during short-circuits. The OVPD acts as an equipotential bonding device by connecting temporarily Running Rail to the station earth. The scope of work includes design, supply, installation, testing and commissioning of devices along with accessories. This OVPD shall be suitable for integration with existing stray current monitoring system installed at OCC & BCC, if required subject to Engineer's approval.	We understand that OVPD will be integrated with new Stray current monitoring system and there is no existing stray current monitoring system at OCC/BCC as the existing corridor is based 25kV AC System. Kindly confirm In case, existing stray current monitoring system at OCC/BCC is available, kindly provide the details	SCMS is required for 750V DC system
251.	Volume 7 Pricing document Clause 10.13.2 A4 Page 78/83 & Volume 4: ERTS, clause 2.5.5 Page 24/651	A4 Inverter Supply and erection including testing and commissioning of 1 MW inverter set in TSS, complete Supply:- * 01No. Inverter set with all necessary accessories & * Minimum number of two inverters shall be provided at suitable location for recuperation of maximum regenerative energy. The Contractor will be required to design and select TSS locations for inverter installation which provides the highest recovery of regenerative energy. * The Contractor can also propose additional locations for installation of inverters where additional cost can be justified by recovery of energy. This shall be subject to the approval of the Engineer. Additional cost shall be payable to the contractor based on the price agreed in the contract for such additional inverter (i.e. beyond four numbers of inverters).	We understand as per pricing document 10.13.2 A4, contractor needs to put the price of 1 No. of Inverter set against the BOQ line item A4 of Bill No 11.1 Misleanous items As per Volume 4 clause 2.5.5,minimum number of 2 inverters at suitable location shall be provided. Requirement defined in both of above clauses are contradictory in nature & we understand that price for Two inverter set to be quoted in BOQ Bill No 11.1 Item A4. Kindly confirm We also understand that as per traction simulation study, requirement of additional inverter beyond two will be paid extra in line with the price defined in Bill No 11.1 Item A4. It is also requested to modify the clause as below: "The Contractor can also propose additional locations for installation of inverters where additional cost can be justified by recovery of energy. This shall be subject to the approval of the Engineer. Additional cost shall be payable to the contractor based on the price agreed in the contract for such additional inverter (i.e. beyond two numbers of inverters)."	Please refer Addendum 4
252.	Volume 4: ERTS, clause 3.1.16 Table 3.1.15 Page 87 /651	Table 3.1.15 point 6   	As 33kV Cable laying scope from GSS to RSS doesnot fall under the contract LKE (02)-01 neither the scope of 33kV Cable suuply and laying from GSS to RSS defined in BOQ. Therefore, it is requested to shift the scope of cable trench construction from LKE (02)-01 Contractor to respective designated contractor.	Please refer addendum 2
253.	Volume 4: ERTS Clause 3.1.16 INTERFACE WITH POWER SUPPLY AUTHORITIES Page 85/651	Table 3.1.15 2. Supply, laying, installation of 132kV Cables from PSA GSS to UPMRCL LKO RSS a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end. c. Shall co-ordinate with PSA for path for laying cable inside PSA GSS.	We understand as per power feeding diagram of East West corridor, scope of Supply & Erection of 132 kV Cables is not part of LKE (02)-01 tender Therefore, it is requested to delete the whole requirement in clause 3.1.16 Table 3.1.15 Point 2	Please refer addendum 2
254.	Volume 4: ERTS Clause 2.5.12. Design Submittals: Page 27/651	Power Factor study	As per clause 2.5.12, power factor study to be conducted & the respective correction equipment are to be supplied if required. However, any specification of the power correction equipment neither mentioned in tender specifications nor defined in any line item of BOQ. Henceforth, we understand being the DC traction system, power factor correction study is not required. Kindly confirm	Tender condition shall prevail
255.	Vol 1 ANNEXURE - 4 REQUIREMENTS FOR TENDERER'S TECHNICAL PROPOSALS B8. Proposal for equipment /systems Page 74/157	Where similar equipment or Sub-systems of a different rating are already proven in service, then the design shall be based on such equipment. In case these stipulations are not fulfilled, the Contractor shall furnish sufficient information to prove the basic soundness and reliability of the offered Sub-system and can be adopted only after the approval of the employer. The system will be permitted to be energized only after the technical audit by an independent renowned agency.	We understand that the audit referred is the audit of the offered sub system only and not of complete system, kindly confirm	Tender condition shall prevail
256.	Volume 4: ERTS 3.1.13 INTERFACE WITH TELECOM CONTRACTOR Page 83/651	CCTV in RSS b. Shall provide the necessary cable routing for CCTV locations.	The cabling and it's associated cable tray works should be in scope of telecom contractor while LKE(02)-01 contractor can support for routing only. Kindly confirm.	Please refer addendum 2
257.	Volume 4: ERTS Clause Table 18.12: Typical Requirement of various Equipments Page 595/651	Table 18.12 Typical Requirement of various Equipments	Input/Output signals defined in table 18.12 for 132kV GIS, Power transformer, etc doesnot belong to contract scope of work. Kindly revise the IO list in line with the respective contract scope of work.	For SCADA upgradation work
258.	Volume 4: ERTS Clause 15.3.5.8 Paint Page 366/651	Painting should be suitable for polluted atmosphere and has to comply with IEC 60721-2-5 standard	We understand that type tested panels as per governing IEC 62271 with such CRCA powder-coated sheet steel having satisfactory performance across several installations in India as well as globally shall be considered. Kindly Confirm	Please refer tender documents
259.	Volume 4: ERTS Clause 19.8 RELIABILITY Page 641/651	Power Supply and Third Rail System The reliability for the full traction power supply system shall be designed as N-½ Scenario (for Design Year). Further, failure of a single item shall not cause failure of the entire traction power supply system.	We understand that the complete power supply and tration system shall be based on n-1 failure scenario only. Kindly clarify	Please refer tender documents
260.	Volume 4: ERTS Clause 19.8 RELIABILITY Page 641/651	Power Supply and Third Rail System The reliability for the full traction power supply system shall be designed as N-½ Scenario (for Design Year). Further, failure of a single item shall not cause failure of the entire traction power supply system.	Kindly specify the design year and it's loading parameters (PHPDT, no. of cars etc.)	Please refer tender documents
261.	Volume 4: ERTS Clause 15.4.9 TEST SHEET FOR RECTIFIER 15.5.8 TEST SHEET FOR RECTIFIER TRANSFORMER Page 386/651 Page 395/651	Combined short circuit shall be carried out at Third Rail at site in accordance with clause 7.7 of EN 50327 (latest)	Combined Short circuit test on rectifier & transformer are not conducted in any of the earlier metro project & definatue method statement of such test is not avialbe for site testing. However, Short circuit test reports of individual unit of rectifier & transformer will be made avialbe during execution. Therefore, It is requested to delete the requirement of combined short test of rectifier & transformer.	Tender condition shall prevail
262.	Volume-5 Tender drawings	INTEGRATED EARTHING SCHEME FOR DEPOT	we understand that the depot shall be floating type, kindly share the details of depot to ascertain requirements of earthing of workshop lines. Also, kindly clarify the interface requirements of installing the arrangement required for return current between workshop lines and depot TSS	Please refer addendum 2
263.	Volume 4: ERTS Clause 16.2.4.3 Splice Joint Assemblies Page 448/651	16.2.4.3.3 Fastenings shall be with not less than four Huckbolts made of Aluminum or high tensile carbon steel with Zinc plating.	Kindly allow use of Aluminum alloy for Fastenings	Tender condition shall prevail
264.	Volume 4: ERTS Clause 16.2.4.4 Expansion Joints Page 449/651	16.2.4.4.5 Electrical continuity across the sliding surface shall be maintained by a copper rolling shunt designed to carry 4500 A	It is requested to amend the clause as "Electrical continuity across the sliding surface shall be maintained by a copper rolling shunt or flexible copper cables to carry 4500 A"	Tender condition shall prevail
265.	Volume 4: ERTS Clause 15.10.2.1 Page 421/651	15.10.2.1 The DC cables are in accordance with IEC 60502-1. The cable shall conform to IS specification No. 7098 Pt-II or latest	DC Cable can be manufacture as per IEC 60502-2 or IS 7098 Pt-II. As per OEM recommendation, both standards cannot be clubbed for various paramenters of the cable. Henceforth, it is requestd to accept the DC cable manufacturing in line with IS 7098 Pt-II requirement. Kindly Confirm	Tender condition shall prevail
266.	Volume 4: ERTS Clause 13.2.2.1 Page 249/651	13.2.2.1 The 33kV cables shall, otherwise specified generally conform to IS 7098 Part II, IEC 60502-Part 2, IEC 60228, and IEC 60811 for construction and IEC 60840 for testing.	33kV Cable can be manufacture as per IEC 60502-2 or IS 7098 Part-II. As per OEM recommendation, both standards cannot be clubbed for various paramenters of the cable. Henceforth, it is requestd to accept the 33kV cable manufacturing in line with IS 7098 Part-II requirement. Kindly Confirm	Tender condition shall prevail
267.	Volume-5 Tender drawings	General	Kindly provide the following drawings for estimation of BOQ: 1. Third Rail Feeding Schematic Mainline & Depot 2. Sectioning Scheme of Mainline & Depot 3. Layout of Depot 4. Elevation of RSS/AMS Building 5. Overall Layout of Vasantkunj RSS/AMS 6. Typical Earth Mat Layout for 33kV Receiving Substation 7. Cable layout in Vasantkunj Depot (33kV, 750V DC, LT & Control Cable) 8. Sectioning Scheme of Vasantkunj Depot 9. Alignment of route highlighting gradients, station length and curve details.	Please refer addendum 2

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
268.	Volume 4: ERTS Clause 3.1.3.1 INTERFACE WITH TRACKWORK CONTRACTORS Table 3.1.3 Page 39/651	Table 3.1.3 Point 7 Shall arrange to design scheme of return current cable connections through CAD welding to running rail and advice the location of the same to the Track Contractor.	Cable lugs are being used in recent metro projects in India, eliminating the requirement of CAD welding. Kindly revise the specifications to use DC Cable lugs for connections.	Tender condition shall prevail
269.	Volume-5 Tender drawings AGCC01-11718A-TDR-RSS-TR-PWR-71569 Page 15/87		We understand that there is no Power transformer at Ongoing end for GSS end ,so no Buccolz & PRV relay envisaged in 33kV Incomer panel in RSS.	Please refer addendum 2
270.	Volume-5 Tender drawings AGCC01-11718A-TDR-RSS-TR-PWR-71571 Page 16/87	Protection relays	Two Main Protection(87L) & two back up relay for OC & EF are shown in tender SLD . Kindly confirm if two relays are required for each protection.	Please refer addendum 2
271.	Volume-5 Tender drawings AMS SLD Drg No-AGCC01-11718A-TDR-RSS-TR-PWR-71571 Page 16/87	Note no 7.The PAC RSS is situated in Depot premises; therefore, depot auxiliary transformers and traction transformers are fed from 33kV RSS busbar directly.	We understand that as per power feeding arrangement shown in tender drawings, depot auxiliary & traction transformers will be feed through 33kV Panels of Depot. Kindly delete this note from the tender drawings	Please refer addendum 2
272.	Volume-5 Tender drawings AMS SLD Drg No-AGCC01-11718A-TDR-RSS-TR-PWR-71571 Page 16/87	Note no 5. Both main & standby IED/relay shall be operational in parallel. In case of outage of main IED/relay, standby IED/relay will be operational automatically.	We understand that Main relay is to be consider as Unit protection relay & stand by protection relay as backup protection relay. Kindly confirm	Tender condition shall prevail
273.	Volume 4: ERTS, clause 17.8.2.1.1 Page 487/651	UPS At each station a UPS and UPS distribution switchboard will be provided by a designated contractor	We understand that requirement of UPS at each station is not in the scope of LKE (02)-01 contractor and will be provided by Signaling contractor. Kindly confirm Alternatively it is requested to defined the respective line item in BOQ for UPS	Tender condition shall prevail
274.	Volume 4: ERTS, clause 12.1.1 Page 161/651	General	The East West Corridor of Lucknow Metro Rail will have one 33 kV Receiving Substations/Auxiliary Main Substation, viz. Vasantkunj shall be Air Insulated Switchgear type substation. kindly confirm the type of substation whether outdoor or indoor 33kV substation.	Indoor type(AIS)
275.	Volume 4: ERTS, clause 12.3.5.2.1 Page 179/651	33 kV Switchgear Interlocking	We understand Syn check of 33kV supply on bus coupler feeder will not be required as two source of supply will not be operated in parallel. Kindly confirm	Please refer addendum 2
276.	Volume 4: ERTS, clause 12.6.9.2 Page 187/651	LINE DIFFERENTIAL PROTECTION (87C/87L)	Protection relay of utility end is not the scope of LKE(02) - 1 contractor. Please confirm	Bidder understanding is correct
277.	Volume 4: ERTS, clause 12.6.9.4 Page 188/651	BACKUP O/C PROTECTION (50/51, 50N/51N)	we understand that, the backup relay protection function is the part of same relay(including in the primary protection such as 87L,21)	Tender condition shall prevail
278.	Volume 4: ERTS, clause 12.16.12 Page 244/651	12.16.12 Cable paths The LKE(02)-01 Contractor shall provide all cable paths in the HV yard, in the AMS area and inside the AMS & Control Room Building.	We understand that the set of 33kV incomer & Outgoing bays will be mounted at the outdoor yard. Kindly confirm	Both incomer & outgoing bay shall be indoor type
279.	Volume 4: ERTS, clause 12.14 Page 226/651	ADDRESSABLE FIRE DETECTION AND ALARM SYSTEM	We understand that fire detection & alarms to be addressed at local monitoring only, please confirm	Please follow tender conditions
280.	Volume 4: ERTS, clause 12.12.4.1 Page 218/651	CONSTRUCTION FEATURES Note: For Vasantkunj RSS/AMS, no separate 200kVA transformers are provided as the requirements are being met from depot auxiliary transformers. Refer tender drawings.	Please confirm the requirement of AC distribution will be considered at depot only	Please follow tender conditions
281.	Volume 4: ERTS, clause 2.5.5 Page 23/651	2.5.5. Traction Sub Station (TSS)	Kindly provide the specification of inverter transformer	Please follow tender conditions
282.	Volume 4: ERTS, clause 2.5.5 Page 23/651	2.5.5. Traction Sub Station (TSS)	We understand that the location of inverter panel shall be decided during execution, however, we understand the associated 33kV Circuit breaker shall be identical to other 33kV breakers and 4000A LBS shall be same as used in bypass coupling panel. Kindly confirm	Please follow tender conditions
283.	Volume 4: ERTS Clause 2.5.12. Design Submittals Page 27/651	Harmonic Filter	We understand only harmonic study is to be carried out and no equipment like harmonic filters are to be supplied. Kindly confirm	Please follow tender conditions
284.	Volume 4: ERTS, clause 18.6.5.14 Page 527/651	One no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software is installed in each existing RSS of N-S corridor and one no. Disturbance Recorder (DR) workstation with 24" LED display incl. fault analysis and relay configuration software to be installed at Vasantkunj depot RSS/AMS of E-W corridor by the contractor with facility of its Remote Desktop at OCC & BCC.	We understand that DR feature will be integrated part of relay. Kindly confirm	Tender condition shall prevail
285.	Volume 4: ERTS Clause 16.2.3 RATINGS Page 447/651	Short circuit withstand capacity 50 kA for 1 sec	We understand that the third rail shall be as per rectifier short circuit rating which is defined as 50 kA for 150 ms sec as per table 15.5. Kindly modify	Bidder to follow the Tender condition
286.	Volume 4: ERTS, clause 14.2.8.6.4 Page 294/651	The protection on 33 kV incoming feeder in RSS AMS a) 50: Instantaneous over current protection b) 51: Time delayed over current protection c) 50 N: Instantaneous earth fault protection (zero sequence) d) 51 N: Time delayed earth fault protection (zero sequence) e) 27: Under voltage relay f) 59: Overvoltage Relay. g) 74: Trip Circuit Supervision relay. h) 87L: Line Differential (Pilot Wire) i) 87T: Power T/F diff	As per clause 14.2.8.6.4, 87L Line differential & 87T Transformer differential both protections have been mentioned, therefore it is requested to clarify the following: 1. Distance between the GSS & RSS is in the range of 2.5 km to 6.5 km for respective incoming feeders. Hence, it is understood that 33kV outgoing cables from GSS will be from 33kV Switchgears located at GSS end. Therefore, 87T transform differential protection will not be applicable in this scenario. Kindly confirm 2. If above defined 33kV Cables are terminated directly at transformer bushings then as per I.E rules, power transmission for longer distance is not allowed from GSS to RSS without 33kV breakers at GSS end for safety protocols. In view of above, it is requested to provide the power transmission scheme & SLD at GSS end.	Please refer addendum-4 (Tender Drawing)
287.	Volume 4: ERTS clause 13.2.3.4 Table 13.3 Page 251/651	33kV CABLE SPECIFICATIONS Table 13.3 point 1,2 & 3	1.. We understand that the 2x[3 x (1C x 300 mm2)] Aluminium Conductor FRLS cable from Vasantkunj RSS to Vasantkunj Depot stands for 2 circuit of 3 phase single core cable, not for single circuit of 2 run of 3 phase single core cable. In line with cable requirements defined in power feeding diagram, following table heading of table 13.3 will be amended as below: Cable Size (for each circuit)" The same understanding is applicable for point1, 2 & 3 also. Kindly confirm	Please refer addendum 2 (Tender drawing)
288.	Addendum 2 Annexure 23 Page 117/133	INTERFACE WITH POWER SUPPLY AUTHORITIES, Table 3.1.15, Item no.3 Protection Co-ordination a. Shall coordinate for protection relay settings with PSA ensuring proper relay co-ordination.	We understand that PSA/GSS end differential relay is not in the scope of LKE(02)-01 contract for 33kV cable protection. Kindly confirm	Please refer addendum 2
289.	Volume 4: ERTS Clause 16.2.4.2 Conductor Rails Page 447/651	16.2.4.2 The conductor rails shall be rated at a nominal resistance of max. 0.007 Ω / km at a current of 4500 A. Rails shall be preferably supplied in lengths of 11m to 15m with pre-drilled holes for splice joints. The typical configuration of the conductor rail shall be – Aluminum: EN-AW 6101B & Stainless Steel: 1.4016, X6Cr17, 17% Chromium or equivalent to match the industry standards acceptable to project requirements. In any case the stainless steel shall have minimum 16% Chromium. The stainless-steel strip thickness at the contact surface shall be nominal 6 mm.	Kindly allow use of other alloys like EN AW 6063 which is accepted in other metro projects also.	Please follow tender conditions

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
290.	Volume 4: ERTS Clause 15.13 Page 429/651	DESCRIPTION OF THE EARTHING SWITCHBOARDS IN DEPOT (TRACKSIDE)	We understand that the depot is floating negative, the requirement for TRED (Third Rail Earthing Device) outdoor is not clear, kindly clarify the purpose and scope for the outdoor TRED. We also understand that outdoor TRED is not required and an indoor TRED will suffice. Kindly confirm.	Outdoor TRED will be required. However, successful bidder can propose indoor/outdoor TRED during detailed design at no extra cost.
291.	Vol 7 Pricing Document - Bill of Quantities Explanation (BOQ Bill Nos. 6.1 – Traction Substation) Item A1.4, A2.4 ,toA 6.4 Page 30/83	Supply, erection, testing and commissioning of set of two Pole (2X2P) Motorized Short Circuit & Earthing Panel along with all necessary accessories as per specifications	We understand that a 4 pole motorized Short Circuit & Earthing Panel can be supplied in place of 2x2 pole motorized Short Circuit & Earthing Panel, Kindly confirm.	Please refer tender conditions
292.	Volume 4: ERTS Clause 2.5.5, Page 23/651	The minimum capacities of major equipment for Traction Sub Station (TSS) are as under DC cables 300 Sq.mm Copper 6 runs per feeder	We understand that the number of runs of cables are tentative and shall be finalized as per the traction simulation study during execution. Kindly confirm.	Please follow tender conditions
293.	Volume 4: ERTS Clause 15.3.6.2, Page 367/651	The cubicles shall be protected against fire by means of automatic fire detector and extinguisher system with linear fire detection tube based clean agent direct gas flooding system	We understand that the linear fire protection system shall not be applicable to HSCB & Rectifier panels as the panels are type tested for IP protection without the linear tubing. Kindly confirm.	Please follow tender conditions
294.	Volume 4: ERTS Clause 15.8.1.1 Page 406/651	Double pole motorized Load Break switches are envisaged only at depot isolation	Specifications of only off load disconnectors are provided. Kindly provide detailed specifications for load break switches if load break switches are different from load disconnectors.	The contractor has to propose and take approval of the engineer/employer during detailed design stage, which shall suffice the operational & technical requirement at own cost.
295.	Volume 4: ERTS Table 15.17 Page 407/651	Short circuit withstand current 125kA 250 ms	The SC rating are very high for 4000A disconnecter. Kindly revise to 50kA for 250ms	Please follow tender conditions.
296.	Volume 4: ERTS Clause 15.10.10 Page 421/651	LV Bus Duct / DC Cable	We understand that DC Cables can be proposed in place of LV Bus duct for similar rating of Current. Kindly confirm.	Please follow tender conditions.
297.	Volume 4: ERTS Clause 15.8.1.3 Page 406/651	At some locations, these Disconnector switches shall be installed in mid sections of viaduct and tunnel	Kindly provide sectioning of mainline indicating the location of such disconnectors and its mounting arrangement may kindly be clarified in interface chapter.	Please refer addendum 2
298.	Volume 4: ERTS Clause 15.10.4.1 Page 413/651	The cable shall be manufactured by a company having ISO Accreditation for quality. The manufacturing process of XLPE cable shall consist of insulation cross linked by dry curing technology to ensure homogeneity and absence of micro voids. The cables shall be manufactured by "Wet Curing" Process.	We understand that wet curing & dry curing both process will be acceptable for Cable Manufacturing Kindly confirm	Please follow tender conditions.
299.	Volume 4: ERTS Clause 13.2.4.1 Page 252/651	The cables shall be manufactured by "Dry Curing" Process.	It is requested to allow wet curing process also for 33kV Cable Manufacturing Kindly confirm	Please follow tender conditions.
300.	VOLUME – 1 ITT Clause A1.1 Page 41/157	The contractor has to design & validation of the preliminary design provided by DDC for the complete system.	Kindly provide a list of DDC documents to be validated	will be provided after LOA
301.	Volume 4:ERTS Clause 2.5.1 Page 21/651	The Contractor shall carry out Simulation study, to ascertain the load requirement of the system to verify the sizes/rating of the equipment and submit report for approval by the Employer.	It is requested to provide the auxiliary & traction load details to carry out the simulation study & access the rating of equipments	It will be shared with successful bidder during detailed design stage.
302.	Volume 4: ERTS Clause 16.2.4.2.3 Page 447/651	Conductor rails shall be designed to not exceed 40°C heat rise above ambient of 50°C at 4500 A continuous current (with air circulation)	Kindly specify if the air circulation is considered as 1m/s.	Bidder to consider the tender condition
303.	Volume 4: ERTS Clause 17.15.6 Page 503/651	PSD Contractor shall ensure to maintain the insulation from the platform floor/concrete and shall ensure that at no point other than the fixing points for the PSD installation shall affect the insulation membrane	Kindly provide interface matrix with PSD contractor.	Please refer Addendum 2
304.	Volume 4: ERTS Clause 17.15.6 Page 503/651	PSD Contractor shall ensure to maintain the insulation from the platform floor/concrete and shall ensure that at no point other than the fixing points for the PSD installation shall affect the insulation membrane	Kindly provide PSD installation drawing to ascertain the quantities of insulation membrane and accessories. Also, kindly provide the number of PSD envisaged on single platform.	It will be shared with successful bidder during detailed design stage.
305.	Volume 4: ERTS, Clause 15.18.1.7.11 Page 436/651	Inverter panel b) 87L: Differential line protective relay	As per the power flow arrangement, the requirement of 87L: differential line Protection is not Valid for Inverter panel. Kindly confirm and provide the Inverter protection SLD for further assessment of the requirement.	Please refer addendum 2
306.	Volume 4: ERTS, Clause 14.7.3.2 Page 351/651	LIGHTING ALONG THE VIADUCT	Please confirm the passenger emergency evacuation on viaduct whether parapet walls or along the sides of the viaduct (via parapet / side walkway), accordingly the location of max. Lighting Lux level can be maintained.	Evacuation will be by opening front side of Rolling stock and through track.
307.	General	LIGHTING ALONG THE VIADUCT	Viaduct chainage towards dead end & depot for lighting not provided. please confirm chainage or respective drawing	Please refer addendum 2
308.	Volume 4: ERTS - Interface chapter-3 Page 46/651	Viaduct lightning Protection	Please provide the viaduct drawings(section, plan, GA etc) for lightning protection scheme.	Please refer Addendum 4
309.	Volume 4: ERTS, Clause 14.8.1.3 Page 352/651	POWER SOCKETS ALONG THE VIADUCT , Not more than 2 sockets will be operated in one circuit at any time.	we understand that use of 2 sockets would be taken care during operation. Please confirm	Please refer tender conditions
310.	Volume 4: ERTS, Clause 14.8.1.3 Page 352/651	POWER SOCKETS ALONG THE VIADUCT, The cables will be laid in PVC conduits fixed on the parapet.	We understand that power socket cable will be armoured type. Therefore, it is requested to accept laying of power socket cable directly on the parapet bracket & no PVC conduits to be laid. Kindly confirm	Please refer tender conditions
311.	General	POWER SOCKETS ALONG THE VIADUCT	Viaduct chainage towards dead end & depot for power Socket is not provided. Please confirm chainage or respective drawing may be provided	Please refer addendum 2
312.	General	FO cable	Please share the specification of FO cable requirment for 87L differential Protection	The contractor shall propose specification of FO cable as per requirement during detailed design stage.

Reply to Pre-Bid Queries

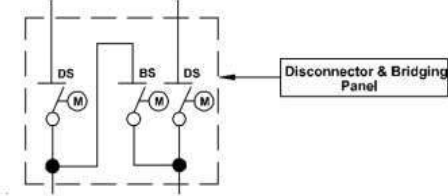
S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply																																																																																																																																				
313.	Volume 4: ERTS, Clause 12.12.5.5 Page 218/651	AC DISTRIBUTION BOARD, In addition, these circuit breakers shall be interlocked with the auxiliary transformer cubicle.	We understand that there is no auxiliary transformer placed at RSS/AMS. Kindly confirm	Confirmed																																																																																																																																				
314.	Volume 4: ERTS, Clause 12.12.5.6.4 Page 219/651	AC DISTRIBUTION BOARD, The following is the minimum expected requirement in each of the main circuit breaker cabinets. 33 kV Switchyard,Transformers, OLTC,Aux. Transformer (as applicable),NIFPS (as applicable),	We understand, in 33 kV Switchyard power transformers/OLTC/NIFPS are not part of scope. Kindly amend the referred clause.	The feeders will be proposed by contractor that will suffice the operational requirement and approval of engineer shall be taken during detailed design stage.																																																																																																																																				
315.	Volume 4: ERTS, Clause 12.11.5.4 Page 216/651	DC DISTRIBUTION BOARD, Outgoing Feeders the power transformer tap changers monitoring the auxiliaries of the fire protection installations the safety lighting installations The signalling lights The position limit switches of the main apparatuses	The mentioned Outgoing Feeders are not found in the tender drawings, Hence, we understand that the requirement of DCDB supply for the following are not required, the power transformer tap changers monitoring the auxiliaries of the fire protection installations the safety lighting installations The signalling lights The position limit switches of the main apparatuses	The feeders will be proposed by contractor that will suffice the operational requirement and approval of engineer shall be taken during detailed design stage.																																																																																																																																				
316.	Volume 4: ERTS, Clause 12.12.5.1 Page 218/651	AC DISTRIBUTION BOARD,Distribution of the low voltage circuits shall be provided with two incomer with coupler cabinet, each supplied by the corresponding auxiliary transformer.	As we understand, Depot E&M contractor will provide two MDB feeder for RSS/AMS ACDB incomer & another one MDB feeder for Depot ACDB incomer supply. Please confirm the same	The contractor shall have to interface with E&M contractor .																																																																																																																																				
317.	Volume 4: ERTS, Clause 12.2.1.13.23 Page 166/251	The Local Control Cubicles shall be integrated with the AIS and should house IEC 61850 compliant Bay Control Unit (BCU) which should be SCADA compatible.	We understand that 33kV AMS AIS switchgear controlling & monitoring along with its protection requirement shall be achieved by 33kV Control Panel with IEC 61850 compliant numerical relay (BCPU). Hence, No seperate BCU shall be required in Local control cubical of 33kV AIS Switchgear in AMS. Kindly confirm.	Please follow tender conditions																																																																																																																																				
318.	Volume 4: ERTS, Clause 14.4.4.3.1 Page 334/651	Table 14.14: Battery Charger Degree of protection is IP 5X	we understand that the batter charger shall be equipped inside the ASS rrom, the requirement of Degree of protection with IP 41 will be acceptable. Please confirm	Tender condition shall prevail																																																																																																																																				
319.	Volume 4: ERTS, Clause 12.13.2.2 Page 222/651 & 12.13.9.2 Page 224/651	LV cable, Clause12.13.2.2 Cables/wires shall be Fire Retardant Low Smoke Type (FRLS) with XLPE insulation 12.13.9.2 All wiring shall be carried out with 1100V grade, single core, stranded copper conductor wires with PVC insulation.	It is observed that the insulation of LV cable requirements specified in the two clauses are contradictory in nature. kindly confirm whether the Insulation requirement of LV cable shall be with XLPE or PVC insulation.	For elevated XLPE FRLS For UG XLPE FRLSZH																																																																																																																																				
320.	General	VASANTKUNJ DEPOT ASS+TSS	Please provide the location of VASANTKUNJ DEPOT ASS+TSS from Vasant kunj RSS/AMS	Please refer Addendum 4																																																																																																																																				
321.	Volume 4: ERTS, Clause 13.2.3.1 Page 250/651	Table 13.2: 33kV Cable Rating, S no. 10	120 Sq.mm. 33kV Aluminum Conductor is not capable for carrying 16 KA for 3 Seconds. It can carry 6.51 KA for 3 Seconds maximum. Plase confirm the Short circuit current carrying capacity of 120sq. mm conductor with 6.51 KA for 3 Seconds	Please refer addendum-4																																																																																																																																				
322.	Chapter 13 Clause 13.2.3.1	Ratings for 120 Sqmm 33 kV Cable Short circuit current carrying capacity of conductor - 16 kA for 3 sec	Kindly provide correct SC rating for 33 kV 120 Sqmm cable as the given parameter of 16 kA for 3 sec cannot be achieved by 120 Sqmm Cable. Further if this SC rating is for metallic screen still it cannot be achieved. Hence, clarify.	Please refer reply of S.no.321 as above																																																																																																																																				
323.	Volume 4:ERTS,Table 15.8: Rectifier Transformer Rating : Sr. No. 12 Page 387/651	Rated short circuit withstand rating for HV winding : 25 kA for 3s	This is system fault current and is only upto transformer terminals. The winding short circuit withstand current shall be as per IS2026-5. Kindly confirm	Accepted																																																																																																																																				
324.	Volume 4:ERTS,Table 15.8: Rectifier Transformer Rating: 15.5.6.4 Page 392/651	Test on insulation: The test consists of applying DC high voltage (2500 V or 5000 V) with the help of a motor driven megger, continuously between winding and earth, and measure insulation resistance at the end of 10 second and 60 seconds. The polarization ratios R60/R10 and R600/R60 should not be less than 1.4 and 1.2 respectively. (R10, R60 and R600 are the insulation resistance values after 10 seconds, 60 seconds and 600 seconds respectively).	As insulation resistance is not listed in list of tests of IS and IEC for Dry Type Transformers, so it is requested to delete the requirement.	Please follow tender conditions																																																																																																																																				
325.	Table 15.8: Rectifier Transformer Rating: 15.5.6.4	Test on insulation: The test consists of applying DC high voltage (2500 V or 5000 V) with the help of a motor driven megger, continuously between winding and earth, and measure insulation resistance at the end of 10 second and 60 seconds. The polarization ratios R60/R10 and R600/R60 should not be less than 1.4 and 1.2 respectively. (R10, R60 and R600 are the insulation resistance values after 10 seconds, 60 seconds and 600 seconds respectively).	As insulation resistance is not listed in list of tests of IS and IEC for Dry Type Transformers, so test cannot be conducted as per requirement of specification. Insulation media being Cast Resin for Dry Type Transformers, it is difficult to predict and achieve values for PI as demanded in specification. Due to limitation of equipment and phenomena of leakage current during measurement, it may not be possible to measure values at 10 seconds measured. Measured Values will be shared for reference purpose only and not bound for any guaranteed value for Insulation resistance and polarization index. Further test shall be carried out using battery operated (5000VDC) Insulation Tester (Megger). Kindly confirm	Please refer reply of s.no.324 as above																																																																																																																																				
326.	Volume 4:ERTS,Table 15.8: Rectifier Transformer Rating: 15.5.8 Page 395/651	Table 15.10: Test Sheet for Rectifier Transformer in accordance with IEC 60076-11. <table><tr><th rowspan="2">INDICATIONS</th><th colspan="4">TYPE OF TEST</th></tr><tr><th>Type</th><th>Routine</th><th>Acceptance</th><th>On Site</th></tr><tr><td>Temperature rise</td><td>X</td><td></td><td></td><td></td></tr><tr><td>Lighting impulse withstand voltage test</td><td>X</td><td></td><td></td><td></td></tr><tr><td>Separate source voltage withstand test</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Insulation resistance test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Measurement of winding resistance</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Measurement of voltage ratio and check of phase impedances</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Measurement of no-load loss and current</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Measurement of short circuit impedance,load loss and current</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Verification of design of protection</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Partial Discharge Test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Visual inspection</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Humidity Measurement</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>Measurement of cooling fan</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>Measurement of ground level</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>Check of digital temperature controller</td><td>X</td><td>X</td><td></td><td>X</td></tr><tr><td>Short circuit withstand test</td><td>X</td><td>X</td><td></td><td>X</td></tr><tr><td>Induced Over voltage test</td><td>X</td><td>X</td><td></td><td>X</td></tr><tr><td>Rectifier transformer combined</td><td>X</td><td></td><td></td><td></td></tr><tr><td>Harmonic test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Balance test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Winding Resistance Test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Insulation Resistance Test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Functional Test</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Climate Test</td><td>X</td><td></td><td></td><td></td></tr><tr><td>Environmental Test</td><td>X</td><td></td><td></td><td></td></tr></table> For these test items, the contractor shall provide a report on test equipment used and shall ensure that the test is carried out at their plant at site in accordance with Clause 5.4 of BIL 2020-2.	INDICATIONS	TYPE OF TEST				Type	Routine	Acceptance	On Site	Temperature rise	X				Lighting impulse withstand voltage test	X				Separate source voltage withstand test	X	X	X		Insulation resistance test	X	X	X	X	Measurement of winding resistance	X	X	X		Measurement of voltage ratio and check of phase impedances	X	X	X	X	Measurement of no-load loss and current	X	X	X		Measurement of short circuit impedance,load loss and current	X	X			Verification of design of protection	X	X			Partial Discharge Test	X	X	X	X	Visual inspection	X	X	X	X	Humidity Measurement	X		X		Measurement of cooling fan	X		X		Measurement of ground level	X		X		Check of digital temperature controller	X	X		X	Short circuit withstand test	X	X		X	Induced Over voltage test	X	X		X	Rectifier transformer combined	X				Harmonic test	X	X	X	X	Balance test	X	X	X	X	Winding Resistance Test	X	X	X	X	Insulation Resistance Test	X	X	X	X	Functional Test	X	X	X	X	Climate Test	X				Environmental Test	X			
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327.	Volume 4: ERTS, Clause 14.3.3.2 Page 324/651	2. Relevant Specification : IS 11171	IS11171 is obsolete & replaced with IS2026-11. Hence, IS2026-11 will be referred instead of IS11171.	Please follow tender conditions																																																																																																																																				
328.	Volume 4: ERTS, Clause14.3.3 Page 323/651	15. Secondary Voltage at full load & PF 0.8 lag : 390 V	Secondary Voltage at full load & PF 0.8 lag depend up on regulation of the transformer which is in turn depends on % Impedance & Losses of the transformer. Regulation of the transformer is majorly dependent on the % Impedance of the transformer & Since Impedance of Transformer already defined in the specification, hence considering specified impedance we have provided the regulation values & subsequent Secondary Voltage at full load & PF 0.8 lag at transformer terminal. Kindly confirm	Tender condition prevails																																																																																																																																				
329.	Volume 4: ERTS, Clause 14.3.3 Page 323/651	19. Short circuit rating for primary side (at all tapping) : 25kA for 3 seconds	This is system fault current and winiding short circuit current shall be as per IS2026-5. Kindly confirm	Tender condition prevails																																																																																																																																				
330.	Volume 4: ERTS, Clause 14.3.3 Page 323/651	14.3.4.5.1 Each tap shall also be capable of withstanding a voltage of 10% above the rated voltage of the tap.	Transformer shall be designed +/-5% in steps of 2.5% by manually opertated off circuit tap link. However, combined voltage and frequency variation shall be +/-10%. Kindly confirm	Tender condition prevails																																																																																																																																				

2. Relevant Specification : IS 11171

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply																																																																																																																	
331.	Volume 4: ERTS, Clause 14.3.3 Page 323/651	Table 14.12: Test Sheet for 33 kV/415 V Auxiliary Transformer as per IS 11173 <table><thead><tr><th rowspan="2">INDICATIONS</th><th colspan="5">TYPE OF TEST</th></tr><tr><th>Type*</th><th>Routine</th><th>Acceptance</th><th>On Site</th><th>Specials</th></tr></thead><tbody><tr><td>Temperature rise*</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>Lighting - impulse withstand voltage test</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>Separate-source voltage withstand test</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Measurement of winding resistance</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Measurement of voltage ratio and check of phase displacement</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Measurement of no-load loss and current</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Partial Discharge Test</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>Visual inspection</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Phase Displacement</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Impedance Voltage & Load Loss</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>Induced Overvoltage withstand test</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>Measurement of Sound Level</td><td>X</td><td>X</td><td></td><td></td><td>X</td></tr><tr><td>Short Circuit withstand test</td><td>X</td><td></td><td></td><td></td><td>X</td></tr><tr><td>Insulation Resistance Test</td><td></td><td></td><td></td><td></td><td>X</td></tr><tr><td>Magnetic Balance Test</td><td></td><td></td><td>X</td><td></td><td>X</td></tr><tr><td>Turns Ratio</td><td></td><td></td><td>X</td><td></td><td>X</td></tr><tr><td>Magnetization Current Test</td><td></td><td></td><td>X</td><td></td><td></td></tr></tbody></table> * For these type tests, the contractor could provide a report on similar equipment.	INDICATIONS	TYPE OF TEST					Type*	Routine	Acceptance	On Site	Specials	Temperature rise*	X					Lighting - impulse withstand voltage test	X					Separate-source voltage withstand test	X	X	X			Measurement of winding resistance	X	X	X	X		Measurement of voltage ratio and check of phase displacement	X	X	X	X		Measurement of no-load loss and current	X	X	X			Partial Discharge Test	X	X	X	X		Visual inspection	X	X	X			Phase Displacement	X	X	X			Impedance Voltage & Load Loss	X	X	X			Induced Overvoltage withstand test	X					Measurement of Sound Level	X	X			X	Short Circuit withstand test	X				X	Insulation Resistance Test					X	Magnetic Balance Test			X		X	Turns Ratio			X		X	Magnetization Current Test			X			We understand that all routine test on transformer will be conducted in in accordance with IEC60076-11. Partial discharge test & Induce Overvoltage test: Test is performed as routine test as per IEC60076-11, kindly confirm Insulation resistance Test: Measured value shall be recorded for reference purpose only as relevant applicable standard does not specify any reference value.	Tender condition prevails
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332.	Vol 4 ERTS Clause 15.3.5.6.5.1 Page 364/651	The cabling compartment should be designed in such a way that sufficient space is made available for termination of feeders. It may be noted that multiple number of feeder cables shall be connected to each terminal through heat sink termination. The cable compartment depth shall be less than one meter and the clearance between the bottom of the bus bar to base plate is of minimum 500 mm.	The clearance between bottom of the busbar to base plate may vary in line with OEM standard design. Although, clearances for insulation are designed considering the safety & maintenance of the HSCB. Henceforth, it is requested to accept the standard clearances as per OEM design. Kindly Confirm	Tender condition prevails																																																																																																																	
333.	Vol4 ERTS Clause 18.22.1.2 & Clause 18.22.1.3 Page 616/651	Clause 18.22.1.2 The operation of DC traction systems requires suitable measures to prevent corrosion caused by stray currents on railways and non-railway installations. This function is forming a part of the remote monitoring of -Negative Earth Panel -Short Circuiting Device & Clause 18.22.1.3 Stray current monitoring consists of two functions -Supervision of status of short-circuiting devices & Negative relay panel at all TSSs /ASSs and raising an alarm if the device has been activated. -	Contract defined signals for NRP and SCD will be considered in SCADA for remote Monitoring. We understand that direct signals from Negative Earth Panel & Short Circuiting Device not required to be mapped in SCMS System. Kindly confirm	Please follow tender conditions																																																																																																																	
334.	Vol 4 ERTS Clause 18.22.5.1.1 a) Page 618/651	The SCMS includes the following functions: Set up of network lines & stations, up to10 lines and 60 control points	We understand that the only East West Corridor ASS/TSS will only be integrated with SCMS system supplied against LKE (02)-01 contract. For future up coming projects, separate SCMS system will be considered or please confirm how many future corridors will be integrated with SCMS system of LKE (02)-01 Contract.	Please follow tender conditions																																																																																																																	
335.	Vol 4 ERTS Clause 15.4.6.8 Page 382/651	Demonstration of a fire protection system on dummy panel shall be done at the site as required by the Employer. (Combined for all equipment/sub-system).	We understand that there is no spare dummy panel will be provided for fire protection system demonstration. However, testing of the fire protection system at site will be demonstrated in any one of DC Switchgear panel defined in BOQ line items. Kindly confirm	Please follow tender conditions																																																																																																																	
336.	Vol 4 ERTS Clause 15.8.3.1 page 407/651	The equipment to be supplied shall comprise of the isolator complete with mounting insulator and frame work enclosed in a metal clad enclosure. Bus bar chamber shall comprise of main bus bars, termination for connection to the isolator and the adjoining cubicles and the necessary wiring.	Outdoor Disconnecter switches are generally metal enclosed & same have been used in various Indian metro projects. Kindly accept the same.	Please follow tender conditions																																																																																																																	
337.	Vol 4: ERTS, Clause 12.10.2.1 & Clause 14.4.3.2.2 Page 207/651 & Page 332/651	Clause 12.10.2.1 The batteries shall conform to IEC 60623 or latest. & Clause 14.4.3.2.2 The batteries shall conform to IEC-60623 and IEC 62259 specification latest revision for ultra-low maintenance type battery.	Please confirm the IEC 62259 standard for Valve regulated ultralow maintenance type batteries can be considered instead of IEC 60623 or latest.	Please follow tender conditions																																																																																																																	
338.	Vol 4: ERTS, Clause 12.10.8.3, Table 12.36 & Clause 12.10.3.1 Table 12.35 Page 213/651 & Page 207/651	Table 12.36: GTP for Battery & Battery Charger Rating, S no. 5 Capacity offered for 10 hours discharge duration. & Table 12.35: Battery & Battery Charger Rating Sno. 5 Backup capacity 8Hrs	It is observed that battery backup Capacity requirements specified in the two clauses are contradictory in nature. kindly confirm whether the requirement of battery backup Capacity offered for 10 hours or 8 Hours discharge duration.	Please follow table 12.36 of vol 4 (ERTS)																																																																																																																	
339.	Vol 4: ERTS, CI no. 15.5.4.2.5 Page 389/651	The transformer shall be mounted on four bidirectional type flanged wheels for forward and cross wise movement on 1000 mm gauge rails with locking arrangement after installation.	The flanged type wheel are used for Power transformers. The wheels of transformer shall be plain type in supply of previous metros, please confirm	Bidder understanding is correct.																																																																																																																	
340.	Vol 4: ERTS, CI no. 14.6.2.2 Page 344/651	Cables shall be Fire Retardant Low Smoke Zero Halogen Type. (FRLSOH) for underground sections, and Fire-Retardant Low Smoke Type. (FRLS) for elevated sections.	kindly arrange the technical specifications for FRLSOH cables	Please follow tender conditions																																																																																																																	
341.	Addedundum-2 Sl.no 36 Volume 7:Clause 10.4.2, Annexure-26 Page 4/133	33kV cable from UPPCL/DISCOM's Metering Panel In Vasantkunj RSS/AMS to Incomer CBs of Vasantkunj RSS/AMS	We understand that Control cables to be laid from 33kV CT to UPPCL DISCOM Metering panel. We don't envisaged any 33kV Cable laying at RSS for UPPCL DISCOM Metering requirements. In case of requirements differ from the understanding, it is requested to provide 33kV SLD with UPPCL DISCOM Metering panel connection drawing.	Please follow tender conditions																																																																																																																	
342.	Addedundum-2 Annexure-18 Page 27/133	33kV SINGLE LINE DIAGRAM AND PROTECTION SCHEME OF VASANTKUNJ RSS/AMS	Please clarify the requirement of bus bar differential protection (87B) in 33kV Bus coupler of Vasatnkunj RSS/AMS to be considered or not.	Please refer addendum-2																																																																																																																	
343.	Addedundum-2 Annexure-18 Page 27/133	TYPICAL SINGLE LINE DIAGRAM DRAWING from Type-A to Type-H & Depot	Kindly confirm the requirement of OC/EF protection whether non-directional (50/51/50N/51N) or directional (67/67N) functions in the ring feeders(incoming,outgoing & infeed feeders at ASS,ASS+TSS & RSS.	Please follow tender conditions																																																																																																																	
344.	Vol 4: ERTS Clause 16.2.4.5.11 Page 451/651	The ramps shall be covered with standard cover of suitable length. For conductor rail ramps only, mechanical test are required. The Contractor shall provide respective test procedures.	We understand that Mechanical tests are performed under conductor rail section only. Kindly confirm.	Please follow tender conditions																																																																																																																	
345.	Vol 4: ERTS Clause 16.2.4.6.7 Page 452/651	Tests shall be carried out on the mechanical and electrical properties to prove the quality of the arrangement. The Contractor/supplier shall submit respective test programs.	As the anchors does not have electrical functions and hence no tests for electrical properties are required. The function of anchors is purely mechanical. Kindly confirm	Bidders understanding is correct. Please refer addandum -4																																																																																																																	
346.	Vol 4 ERTS Chapter 16 Clause No. 16.2.4.6.7	Tests shall be carried out on the mechanical and electrical properties to prove the quality of the arrangement. The Contractor/supplier shall submit respective test programs.	Anchors does not have electrical functions and hence no tests for electrical properties are required. The function of anchors is purely mechanical.	Please refer reply of query 345 above																																																																																																																	
347.	Vol 4: ERTS Clause 16.2.4.8.10 & 16.2.4.8.14 Page 454/651	At the upper end of the support bracket a molded insulator shall be attached which shall support a cast steel fastener/fix and mobile claw to hold the conductor rail in place. The brackets and fastenings shall be adjustable vertically and horizontally in order to position the conductor rail to the tolerance specified. Consideration must be given to the tolerance and quality of the sleeper ends and slab in providing the required adjustment. Any screws or bolts used to make the adjustment shall be of high-quality stainless steel. After the final adjustment, there shall be sufficient margin to further lower the conductor by at least 20mm to allow for running and conductor rail wear at some future date in the life of system.	Insulator claws could be either of cast steel/cast iron/ cast copper aluminum alloy/ cast stainless steel. It is requested to accept the Cast iron also as Insulator claws Kindly confirm	Please follow tender conditions																																																																																																																	
348.	Vol 4: ERTS Clause 16.2.4.8.11 Page 454/651	Support Assembly: The bracket is an interface between the guide way and the insulator. It shall hold and locate the conductor rail with reference to the running rail. The bracket shall allow the adjustment of conductor rail position, laterally and vertically. The lateral adjustment shall be made by using steel washers behind insulator. The vertical adjustment shall be made by using a screw system. The design shall make the adjustment the easiest and the safe.	We understand that the lateral adjustment can also be performed with slotted holes in the brackets base plate instead of steel washers behind insulators for 2 hole brackets in line with the OEM Design. Kindly confirm.	Please follow tender conditions																																																																																																																	
349.	Vol 4: ERTS Clause 16.2.4.8.12 Page 455/651	All steel parts of the bracket assembly shall be hot dip galvanized with a minimum Zinc thickness of 70µm min and 85 µm average or stainless steel	Galvanization thickness to be as per ISO 1461- depending on the thickness of bracket tubes/plate. Kindly accept	Please follow tender conditions																																																																																																																	

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
350.	Vol 4: ERTS Clause 16.2.4.8.14 Page 455/651	Clamps (Jaws): The clamps are composed of two half clamps made of cast copper aluminium alloy alternatively cast stainless steel clamps may be accepted subject to its provenness and it is designed to withstand the fault force. The half clamps shall be locked together on rail with two stainless steel pins or by minimum one M8 screw. The mechanical properties, such as Tensile Strength, Yield Point, Elongation and Hardness etc. of the clamps shall be according to NF A 53-709 and is not subject to corrosion. Special plastic bearings shall be inserted on the clamp under the rails and on lateral sides to minimize friction thus allowing the conductor rail to expand and contract freely without damaging the insulator or the conductor rail. Alternatively cast stainless steel clamps may be accepted subject to its provenness and Contractor providing all relevant details.	NF A53 709 is no more valid, and it is updated with NF EN 1982-2008. Kindly accept	Bidder understanding is correct.Please refe addendum-4
351.	Vol 4: ERTS Clause 16.2.4.8.22 Page 455/651	The insulators shall withstand 15kV industrial frequency voltage in dry conditions for one minute. The voltage being applied between mounting studs and the rail position shall not cause any flashover.	15kV to be updated to 10kV as per clause 16.2.4.8.25 Kindly confirm.	Please follow tender conditions
352.	Vol 4: ERTS Clause 16.3.2.1.4.1 Page 462/651	A length of rail shall be deformed to simulate the forming of ramp ends. The bonding / connection between the aluminium body and the stainless wearing surface shall not be reduced by bending to a radius of 1000 mm.	A length of rail will be deformed simulate forming of Low-Speed Ramps (slope 1/30). Ramps do not have a bending radius of 1000mm. Kindly Accept.	Tender conditions shall prevail
353.	Vol 4: ERTS Clause 16.3.7.1 S. No. a Page 465/651	Minimizing the ramp length by optimizing the ramp angle for the applicable design speeds taking into account the mass / spring / damper properties of the current collection shoe; and	Ramps slopes is linked to impact load of CCS of the train. CCS are designed to resist to a certain impact and to break over this impact load. Such study must be performed by Rolling Stock AND not by third rail supplier. Kindly Confirm.	Tender conditions shall prevail
354.	Addendum 2-Annexure 18 LKDDC02-TDR-GEN-PST- DWG-38112 Page 33/133	THIRD RAIL SECTIONING DIAGRAM OF VASANT KUNJ DEPOT	Kindly confirm if the static stinger is to be provided in one or both lines of Workshop lines	Please refer addendum 2
355.	Volume 4: ERTS Clause 16.2.6.5.2 Page 459/651	The conductor rail (both power and control) shall be "V" shaped self-guiding contact surface, capable for a continuous current load of at least 800 A. The conductors shall be high conductivity rolled copper section, with properties conforming to BS 2870: 1980 Grade C101	We understand that the control supply may be provided to the trolley through cable of suitable rating/conductor rail of lower to suitable rating as per power requirement of the trolley. Kindly confirm	Please follow tender conditions
356.	Volume 4: ERTS Clause 16.2.6.5.4 Page 459/651	The conductor rail sections (both power and control) shall normally be delivered in individual lengths of about 4.5m which shall be assembled mechanically and electrically to form a continuous stringer runway. The conductor rails (both power and control) including the joints shall be provided with strong, rigid extruded PVC insulating covers (providing protection to IP2X along the length). PVC end covers shall be provided at the ends. Power feed shall be provided to transfer power to stringer system through flexible cables.	We propose to amend the clause as The conductor rail sections (both power and control) shall normally be delivered in individual lengths of about 4.5m / suitable length as oer shipment vessel, which shall be assembled mechanically and electrically to form a continuous stringer runway. The conductor rails (both power and control) including the joints shall be provided with strong, rigid extruded PVC insulating covers (providing protection to IP2X along the length). PVC end covers shall be provided at the ends. Power feed shall be provided to transfer power to stringer system through flexible cables.	Tender conditions shall prevail
357.	Volume 4: ERTS Clause 16.2.6.5.2 Page 459/651	The conductor rail (both power and control) shall be "V" shaped self-guiding contact surface, capable for a continuous current load of at least 800 A. The conductors shall be high conductivity rolled copper section, with properties conforming to BS 2870: 1980 Grade C101	We propose to amend the clause as The conductor rail (both power and control) shall be "V" shaped self-guiding contact surface, capable for a continuous current load of at least 800 A. The conductors shall be high conductivity rolled copper section, with properties conforming to BS 2870: 1980 Grade C101	Tender conditions shall prevail
358.	Volume 4: ERTS Clause 16.2.6.5.5 Page 459/651	The lengths of conductor bars (both power and control) shall be joined by a purpose made bolted joint which shall be of sufficient cross section to carry the rated current and provide structural stiffness whist ensuring mechanical and electrical integrity.	We propose to amend the clause as The lengths of conductor bars (both power and control) shall be joined by a purpose made bolted joint which shall be of sufficient cross section to carry the rated current and provide structural stiffness whist ensuring mechanical and electrical integrity.	Tender conditions shall prevail
359.	Volume 4: ERTS Clause 16.2.8.7 Page 462/651	Contractor shall also procure adequate number of sets of manufacturer's recommended special tools for installation of the third rail. The number of sets handed over should be adequate to achieve to meet the works program.	We propose to amend the clause as Contractor shall also procure adequate number of sets of manufacturer's recommended special tools for installation of the third rail. The number of sets handed over procured for installation should be adequate to achieve to meet the works program.	Tender conditions shall prevail
360.	Volume 4: ERTS Clause 16.4.1.2 Page 468/651	Contractor shall responsible for transportation to site and installation, testing and commissioning of third rail system, for which Contractor shall interface with Track Contractor, Station Contractor, Viaduct Contractor, Depot Contractor and other designated contractors of the Project. All the tools, jigs, equipment, fixtures etc., required for transportation of material, installation, testing and commissioning is under the scope of LKE(02)-01 Contractor.	Kindly confirm supply of these items are billable. Also, kindly indicate the bill number in the BOQ for same.	Please follow tender conditions
361.	General	Access Dates	Kindly provide the access dates for RSS, Depot, Elevated & Underground sections	pleaase refer addendum-2
362.	General	Extension of time	Being a Design & Build Contract, subsequent works to be carried out & also need to align with varios stakeholders in line with pre bid clarifications. In view of the complexity involved in coordinating these activities and incorporating all requirements appropriately, we kindly request an extension of the bid submission deadline by a minimum of 6 to 8 weeks from the current due date.	Please refer addendum 3
363.	Vol-1/ NIT-Clause 1.4.2-Minimum Eligibility Criteria-B-Financial Standing-iii- T3- Annual Turnover & Annexure-2 of NIT-Financial Data	T3 - Annual Turnover: The average annual financial turnover of the bidder during the last five years ending 31st March of the previous Financial Years should be > INR 66.61 Crores	As per Annexure-2 of NIT-Financial Data-Details upto FY 24-25 have been asked. However, as per Clause Vol-1/ NIT-Clause 1.4.2-Minimum Eligibility Criteria-B-Financial Standing-iii- T3- during the last five years ending 31st March of the previous Financial Years is incorporated. We request to kindly clarify whether the financial data during the last five years ending 31st March upto FY 25-26 have to be provided. In such case request to kindly amend the form Annexure-2 of NIT-Financial Data to allow provision of data for year FY 25-26	Please refer Addendum 4
364.	General		We understand that the present tender envisages electrification of both elevated and underground sections. We request to kindly clarify the status of civil packages of both elevated and Underground portions and the proposed completion periods of the same	The Depot & Elevated (Viaduct & Stations) Civil Works Contract has been awarded.
365.	Vol-1/ NIT-Clause 1.3-Source of Funds	This tender is likely to be financed from Bilateral/ Multilateral financing institution or shall be financed through an equity participation by the Government of India and Government of Uttar Pradesh and other appropriate means. The procurement guidelines of the funding agency (Bilateral/Multilateral financing institution) shall be followed.	We request to kindly clarify whether the present tender will be funded by Bilateral/ Multilateral financing institution and/or through an equity participation by the Government of India and Government of Uttar Pradesh and the percentage share of funding from the respective agencies. Also request to kindly clarify the name of the Bilateral/ Multilateral financing institution, if any, who will be proceeding for financing the subject tender	New Development Bank is the Funding Agency.
366.	Chapter 15 Clause No. 15.3.5.6.7.1 c)	Facade measurement indicators (counter, Ammeter & Voltmeter when required)	This functionality is met through Control and Protection Relay. Kindly confirm	Please follow tender conditions
367.	Chapter 15 Clause No. 15.3.4.1 d)	2 load bypass breaker / disconnecter panels (as per tender drawings)	Three Off-Load disconnecter Switches in the below combination are requested, Please clarify if our understanding is correct: 	Please refer Addendum 2 (Tender Drawings)
368.	Chapter 15 Clause No. 15.3.5.9.4 h)	Meters	All Metering functionality is met through our Control and Protection Relay. Kindly allow.	Please refer Addendum 2 (Tender Drawings)

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
369.	Chapter 15 Clause No. 15.3.10.2	The auxiliary contacts shall have a continuous current carrying capacity of at least 5A and shall be capable of breaking 5A current at 110 V DC without any problem.	Is this breaking 5A current at 110VDC is 0.5A or 5A. Please clarify	Please follow tender conditions
370.	Chapter 15 Clause No. 15.7.5.2.1	Manually/ Motorized operated single pole disconnecting switch.	Please specify if the Disconnecter switch to be considered in NRP is Manual or Motorised.	It shall be motorized and if required, It shall be operated manually
371.	Chapter 15 Clause No. 15.18.1.10.2	The rating at 50degC shall be 1.0 MW for continuous operation and the overloading capability shall be 150% for two (2) hours and 300% for one (1) minute of continuous operation according to Class VI of IEC 60146. The inverter will have a voltage detection type with constant or adjustable current and voltage features. The inverter shall have voltage and current detections sensors to regulate the current during inverting mode. The inverter shall have a rated voltage at rated continuous load. The continuous rating shall be defined as the output that can be delivered continuously at rated full load voltage.	The Inverter solution requested is Class VI. May we also propose an alternate overload class that shall suit the Inverter operation? Please confirm.	Please follow tender conditions
372.	Chapter 13 33 kV Cables	IEC 60502 - 2 / IS 7098-2	In tech. spec IS: 7098-2 and IEC: 60502-2 both standards are mentioned, please confirm which standard to follow.	Please follow tender conditions
373.	Chapter 13 Clause 13.2.5.2	Water Penetration Test	Please confirm whether conductor is water tight or not, since in clause 13.2.5.2 water penetration test is mentioned but technical spec is silent about water tight conductor	Please follow tender conditions
374.	Chapter 14 Clause 14.6.2.1	Reference standard for LV Cables	Please Confirm the reference standard from which cables are to manufactured, In tech. spec clause 14.6.2.1 many standards are mentioned.	Please follow tender conditions
375.	Chapter 14 LV Cables	Table 14.9	In table 14.19 Bare or tinned both type of copper is mentioned, please confirm which we have to considered.	Please follow tender conditions
376.	Chapter 14 LV Cables	Armoured / Unarmoured Cables	Kindly confirm whether LV Cables are to be considered unarmoured or armoured as both are mentioned in TS.	Please follow tender conditions
377.	Chapter 17 Clause 17.11.2 / 17.9.3.2.2	In case of hand rail, LKE(02)-01 Contractor shall interface with hand rail contractor/civil contractor for ensuring the continuity of hand rail and wherever the hand rail is discontinuous, shall be bridged with 120 mm2Aluminium cable or 70mm2 copper cable. (Earthing Cable) / The Structure Earth (SE) conductor shall be of Aluminium 185 mm2 size and shall be provided on both sides of the viaduct. All the terminal connections emerging from pier heads, viaduct segments at pier locations shall be bonded with SE cable via 120 mm2 Aluminium cable or 70mm2 copper cable. The SE cable shall link the individual segments by connection bar, aluminium clamp, fixing bolts etc. All exposed material shall be of anti-corrosion type. This SE cable shall be connected to the earth mesh at each TSS/ASS.	Kindly provide the specifications for 120 mm2 Aluminium or 70 mm2 Copper Cable.	Please follow tender conditions
378.	Chapter 17 Clause 17.9.3.2.2	Structure earth cable (185 mm2 Aluminium)	Kindly provide the specifications for Structure Earth Cable	Please follow tender conditions
379.	Chapter 15 Table 15.8: Rectifier Transformer Rating : Sr. No. 4	Rated output voltage LV1 -585 V AC, 3-phase LV2 - 585 V AC, 3-phase	The secondary no load voltage shall be 585 - 585V. Kindly Confirm	Please follow tender conditions
380.	Table 15.8: Rectifier Transformer Rating : Sr. No. 17	Protection Class : IP 3X	IP31 shall be provided. Kindly confirm	Please follow tender conditions
381.	Chapter 14 Clause 14.3.3.2	2. Relevant Specification : IS 11171	IS11171 is obsolete & replaced with IS2026-11. Hence, IS2026-11 will be referred instead of IS11171. Please ammend	Bidder understanding is correct.Please refer addendum-4
382.	Chapter 14 Clause 14.3.3	19. Short circuit rating for primary side (at all tapping) : 25kA for 3 seconds	This is system fault current and winding short circuit current shall be as per IS2026-5. Please clarify	Please follow tender conditions
383.	Chapter 14 Clause 14.3.3	14.3.4.9 Painting	Powder coating to be provided for the Enclosure & MS parts instead of painting. Kindly allow	Tender condition shall prevail
384.	Chapter 14 Clause14.3.3	Testing Requirments	All routine test shall be performed as per IEC 60076-11. Kindly confirm Type test: Kindly allow type test reports for similiar rating transformers. Partial discharge test & Induce overvoltage test shall be performed as routine test as per IEC60076-11. Kindly Confirm. Short Circuit withstand Test: Available similar or higher rating test report within 10years validity submitted. Please allow. Insulation resistance Test: Measured value shall be recorded for reference purpose only as relevant applicable standard does not specify any reference value. Kindly clarify.	Please follow tender conditions
385.	C 2.6	Custom Notification UPMRC project is covered under Project Import 98.01 of Custom Tariff Act according to which only concessional custom duty is payable. The tenderer should avail this benefit. As regards registration under Project Import, after the award of the contract, UPMRC at the written request of a contractor shall facilitate the contractor for getting themselves registered for availing Project Import benefits. The responsibility to avail the concessional benefits under Project Import shall solely rest with the contractor.	Vide NOTIFICATION No. 24 /2017 - Customs dt 23rd June, 2017 Sr.No "3FF (Copy Attached) (vii) the Managing Director or Director (Rolling Sock and Systems) Lucknow Metro Rail Corporation (LMRC). Administrative Building, Near Dr. Bhimrao Ambedkar Samajik Parivartan Sthal,Vipin Khand Gomti Nagar, Lucknow- 226010 is registered as the sponsoring authority for issuance of the sponsorship letter for registration of the projects under projects imports with the customs authority. However the tender has been floated by UTTAR PRADESH METRO RAIL CORPORATION LIMITED. In the tender documents it is specified that UPMRCL was formerly known as LUCKNOW METRO RAIL CORPORATION LIMITED. Hence kindly confirm that presently if UPMRCL can issue the sponsorship letter for the registration of the projects under projects import. Present rate of concessional rate of BCD under projects import should be 7.50%	Please follow tender conditions
386.	GCC / Clause 11.1.4	The Contract Price shall not be adjusted to take into account any increase or decrease in cost resulting from any change in taxes, duties, levies from the last date of submission of the Tender to the completion date including the date of the extended period of Contract except for the following: a) "Change in Taxes/Duties/Levies" means the occurrence or coming into force of the following, at any time after the date of submission of tender. (i) Any new tax which is imposed on Composite Works Contracts applicable on Metro Project. (ii) Change in the rate of Good and Services Tax (GST) on Composite Works Contracts applicable on Metro Project as per GST Act.	"Works Contract" is defined in Section 2(119) of CGST Act: "Works Contract" means a contract for building, construction, fabrication, completion, erection, installation, fitting out, improvement, modification, repair, maintenance, renovation, alternation or commissioning of any immovable property wherein transfer of property in goods (whether as goods or in some other form) is involved in execution of such contract. The Word "Works Contract" to be specify in the tender documents as Special Condition of Contract with mentioning of SAC 995421 "General construction services of highways, streets, roads, railways and airfield runways, bridges and tunnels". Kindly Confirm	Please follow tender conditions
387.	FORM OF TENDER – APPENDIX-1	vii Amount of Professional Indemnity Insurance (PII) of the contract value against BOQ in respect of „design and construct" with AOY (any one year) limit of 2 incidents in a year.	Percent is missing as per dotted line. Kindly confirm what percent of contract value to be considered for PII.	Please refer Addendum 4

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
388.	Clause 16.2.4.5.11-	3rd Rail	Mechanical tests are performed under conductor rail section only. Kindly Confirm	Please follow tender conditions
389.	Pricing Document clause 8	Price Variation Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause...	Considering the long duration of the Project and volatility in the market prices due to ongoing global geo-political situation, we request that all the items should be allowed for Price Variation using appropriate formulae/ indices. It shall be mutually beneficial for the parties.	Please follow tender conditions
390.	SCC clause 23	The Contract Price shall be adjusted for any new tax if introduced after submission of bids on finished product during the contractual completion period, for which the Contractor shall furnish documentary evidence in support of their claims. However, any increase in the cost due to taxes or change in the existing taxes introduced during the extended contractual completion period due to the Contractor's fault shall be to the Contractor's account. The custom duty and GST shall be reimbursable as per Sub- clause 11.1.1 of GCC.	Kindly confirm that 1) Any change in the costs due to change in the existing taxes during the original/ extended contractual completion period shall cause the Contract Price to be adjusted accordingly. 2) Any change in the costs due to introduction of new taxes during the original/ extended contractual completion period shall cause the Contract Price to be adjusted accordingly. 3) GST shall be reimbursable at actuals, and any changes shall lead to change in the Contract Price, accordingly. 4) Customs shall be reimbursable at actuals, and any changes shall lead to change in the Contract Price, irrespective of availability of exemption/ concessional rates, whatsoever.	Please follow tender conditions
391.	Annexures to ITT - Annexure-1	Project Organization - Minimum Key Staff Requirement Rate of Penalty on Non-Deployment per month per person	Kindly note that manpower deployment is a function of ongoing Works at site as well as work fronts availability, therefore continuous deployment of entire manpower is not warranted. It is requested to remove the panalties for non - deployment of manpower. It is requested to allow mobilization of Key resources commensurate with the site requirement.	Please follow tender conditions
392.	General		We understand that the land required for the stores will be provided by the Employer free of cost. Please confirm	Please follow tender conditions
393.	General		We understand that the land required for the office will be provided by the Employer free of cost. Please confirm	Please follow tender conditions
394.	General		We understand that no client facilities have to be provided by the contractor for this project. Please confirm	Please follow tender conditions
395.	12.16.3 / Volume 4: -Technical Specifications, 12.16.3 / Land Preparation	Proposed RSS/AMS , if needed to be built on the filled earth; contractor shall survey the area, conduct geotechnical survey to identify safe bearing capacity and shall design the building with suitable foundation and structure.	As per the initial site survey, open foundation is assessed at proposed RSS location. In case of change in location or if increase in foundation depth becomes necessary due to variations in soil strata identified during the geotechnical investigation, the foundation may be reviewed and a deep foundation may be required based on soil conditions. In such case additional costs related to the deep foundation works shall be payable by the Customer. Kindly confirm.	Please follow tender conditions
396.	12.16.3 / Volume 4: -Technical Specifications, 12.16.3 / Land Preparation	The site will have to be cleared of all existing encumbrances, levelled and compacted. The finished ground level of the Substation site shall be above the Highest Flood Level (HFL) in the Region, to be ascertained by the LKE (02)-01 Contractor and confirmed by the Local Authorities	Since the RSS is proposed inside Depot, Depot Contractor shall be responsible for clearing the site of all existing encumbrances, including leveling and compacting the ground to achieve the specified Finished Ground Level (FGL). Please confirm.	Please follow tender conditions
397.	12.16.2 / Volume 4: -Technical Specifications, 12.16.2 / Site Facilities	Employer's Requirement-Technical Specification for Site Facilities, "contractor shall provide and maintain field offices for use of UPMRC staff during the contract period at the RSS/AMS location of area not less than 30 sqm with toilet & electricity facility including services for office upkeep, consumables, furniture etc."	LKE (02)-01 contractor proposes to provide Pota Cabin office of 40 ft x 10 ft with Pre-wired, with Fitted AC and Seating arrangements at Vasant Kunj RSS/AMS Location after start Physical site activities. Please Confirm the same.	Please follow tender conditions
398.	A.3 / Pricing Document / Access Road	As per Pricing Document Clause no 10.3.2-A3, The approach/access roads shall have a minimum width of 4.5m and length up to 500m" and a load carrying capacity to support 100 tonne trailers.	LKE (02)-01 contractor has considered road inside RSS area only and the Access road/Approach road has to be constructed by depot contractor. Please confirm.	Bidder understanding is correct.
399.	12.16.12.6 / Volume 4: -Technical Specifications, 12.16.12.6 / Boundary Wall	The boundary wall shall be at least 3.0m high from finished level of RSS and provided with concertina wire etc. on the top over a height of approximately 0.5m, above 3.0m. The Boundary wall shall be provided with a gate with sliding barrier which shall be motor-operated. It shall be possible to open or close the gate from a push-button control inside the guard room. RCC pre-cast panels with UPMRC Logo to be used for boundary wall as per Employer's approval.	As per the proposed RSS location layout, the site is surrounded on three sides by the Depot boundary wall, which is understood to be constructed by the Depot Contractor. Accordingly, the scope of the LKE (02)-01 Contractor shall be limited to the construction of the boundary wall on the remaining one side only, using a construction methodology/material other than precast. Please confirm.	please refere addendum-2 depot drawing. Requirement of precasted/others boundary will be decided by the successful bidder during detailed design stage with the approval from Engineer and to be implemented (if required) at their own cost.
400.	12.16.6.3 / Volume 4: -Technical Specifications, 12.16.6.3 (f) / Architectural Services	Control room in the RSS/AMS shall be finished with vitrified tile on floor.	As per the Vasant Kunj RSS/AMS building layout, the Control Room is located on the first floor with vitrified tile flooring is specified in the technical specifications and false flooring is not required. The LKE (02)-01 contractor has not considered a false floor for this room. Kindly confirm	Requirement of false flooring at control room of RSS/AMS building will be decided by the successful bidder during detailed design stage with the approval from Engineer and to be implemented (if required) at their own cost.
401.	12.16.6.3 / Volume 4: -Technical Specifications, 12.16.6.3 (g) / Architectural Services	Battery room shall be finished with hard floor – acid resistant, walls to be with glazed ceramic tile for 2.5m (minimum), above it shall be finished with acrylic emulsion paint.	As per the tech specification, acrylic emulsion paint is mentioned for walls above the 2.5 m level. Generally, acid-resistant wall paint is used in these areas. Kindly confirm...	Please follow tender conditions
402.	12.16.7.3 / Volume 4: -Technical Specifications, 12.16.7.3 / Doors & windows and RSS Building Elevation Drawing	Windows to each room shall be of an area, not less than 20% of the floor area or as per Indian standard, whichever is maximum.	For SWR/AMS and Battery rooms, we propose providing only ventilation openings for natural light, paired with an exhaust system for proper air circulation. Additionally, as the current elevation drawings for the RSS Building show an number of windows, please confirm that contractors may be allow to optimize the window.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
403.	12.16.12.3 / Volume 4: -Technical Specifications, 12.16.12.3 / Inside Rooms	The cable paths inside the rooms shall be in the form of cable trenches with necessary cable supports and covered by steel/aluminium checker plates of good and aesthetic quality.	Cable trench cover shall be Mild steel checked plates is standard practice. Please confirm.	Please follow tender conditions
404.	12.16.9 / Volume 4: -Technical Specifications, 12.16.9 / Safety Services	Firefighting equipment shall be provided in accordance with the recommendations of the Lucknow City Fire Brigade.	LKE (02)-01 contractor has considering fire extinguisher and FACP system. Please confirm.	It will be decided by the successful bidder with the approval from engineer during detailed design stage with the approval from Engineer and to be implemented (if required) at their own cost.
405.	12.16.1 / Volume 4: -Technical Specifications, 12.16.1 / Architectural Services	Civil Works/RSS/AMS Building shall be in line with the requirement of the NBC and other requirements for Green Building in line with LEED/IGBC shall be implemented in civil works.	Since the RSS/AMS building proposed inside the depot IGBC certification has to be taken by depot contractor and LKE (02)-01 contractor may use the materials as per IGBC. Please confirm.	Please follow tender conditions
406.	/ General / Architectural Services	Brick Work	As per IGBC, AAC or Fly ash brick to be preferred as per standard. Kindly confirm.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
407.	12.16.12 / Volume 4: -Technical Specifications, 12.16.12 / Cable paths	The cable path in the open yard shall be in the form of suitable RCC cable trenches with necessary ladder type (for HV cable) & perforated cable tray (for LT & control cable) of GI steel dully supports on GI steel support and with appropriate RCC covers having peripheral edge protection angles /MS sheet for precast covers or in the form of Heavy	As per the GAD OF VASANT KUNJ RSS/AMS drawing, the 33kV cable trench including GI steel support and RCC covers outside the RSS building is in the scope of depot contractor scope. Please confirm.	Please refer Addendum 4 (Tender Drawing)
408.	/ DS & ETS FOUNDATION DRAWING /	General	Civil Drawing foundation Depth is mentioned, we understand that incase of increase in depth or Type of Foundation it will be payable from customer.	Please follow tender conditions
409.	Tender Drwg. No.: AGCC01-11718A-TDR-C01-TR-PWR-71951 & TS Clause 15.10.3 Table 15.20 / DC cable / Traction Substation	General	TS Clause 15.10.3 Table 15.20 showing Negative cable for Running Rail to NRP as 6 Run and in Drawing: AGCC01-11718A-TDR-C01-TR-PWR-71951 showing 8 Run as per reference. Please confirm the no of Runs required & contractor is allowed to optimized the No of cable runs as per Design Validation.	Please refer Addendum 2
410.	Tender Drwg. No.: AGCC01-11718A-TDR-C01-TR-PWR-71951 / DC Positive cable / Traction Substation	General	DC positive cable One section feeding given in opposite side of ASS/TSS. Request to consider the DC positive cable all feeding nearest to TSS. As Similar to other metros like GMRL, MP Metro, Bangalore metro, etc	Please refer Addendum 2
411.	/ General / Depot	General	Requested to provide the 415V, 33kV and 750v DC cable routing in depot for cable bracket ,tray and Earthing for quantity estimation.	Please refer Addendum 4
412.	/ General / Chainage	General	Requested to Provide the Depot to Mainline section drawing with Chainage.	Please refer Addendum 2

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
413.	/ General / Underground	General	Number of UG Cross passage details is required for ETS and its cabling estimation. Requesting to provide the same.	No. of UG Crossover is 5
414.	/ General / ETS	General	Depot sectioning along with ETS is required for quantity estimation. Requested to provide the same.	Please refer Addendum 2
415.	/ General / Depot	General	Depot ASS/TSS location not shown in Depot Drawing. Please provide the same.	Please refer Addendum 4
416.	Bill No. 6.1 Item Nos.: 1.4, 2.4,3.4,4.4,5.4 / 2P Motorised SCD / Traction Substation	Supply, erection, testing and commissioning of Two Pole (2P) Motorized Short Circuit & Earthing Panel along with all necessary accessories as per specifications	2P motorized SCD showing in Pricing document but not indicated in SLD. Please confirm its requirement.	Please refer Addendum 2
417.	Bill No. 6.1 Item Nos.: 1.4, 2.4,3.4,4.4,5.4 / Disconnecter switch for Outgoing HSCB Panel / Traction Substation	Supply and erection including testing and commissioning of dis-connector switch for Outgoing HSCB panel.	For Mainline, Dis-connector switch for Outgoing HSCB panel showing in Pricing document but not indicated in SLD. Please confirm its requirement.	Please refer Addendum 2
418.	Bill No. 6.1 Item Nos.: 6.4 / Double pole motorised LBS switch / Traction Substation	Supply, erection, testing and commissioning of double pole motorised LBS switch at Depot	For Depot, Double pole motorized LBS switch showing in Pricing document but not indicated in SLD. Please confirm its requirement.	Please refer Addendum 2
419.	Bill No.: 1.1 / General /	General	Since the Item 1.1 has been deleted, 33KV Cabling from GSS to RSS including cable trench its support and sealing are not under the scope of Traction contractor. Please confirm.	Please refer Addendum 4 (Tender Drawing)
420.	Pricing BOQ / General / BOQ	General	Billing break up to may be allowed to facilitate the payment. Please confirm.	Please follow tender conditions
421.	GCC 11.4.1 / Application for Interim Payment /	General	Since LKE-02-01 having separate payment for supply of equipment's and erection & commissioning, bidder assume that 100% payment against supply quoted amount will be paid against supply of equipment at site/Lucknow with Indemnity Bond and erection & commissioning amount paid after erection & commissioning of the equipment. Please confirm	Please follow tender conditions
422.	TS Clause: 14.2.6.8 & 14.3.5.3.1 / 33kV Switchgear, Auxilary and Traction Transformer / Gas flooding system	The cubicles shall be protected against fire by means of automatic fire detector and extinguisher system with linear fire detection tube based clean agent direct gas flooding system. The detection has to be done by the linear heat detection tube which will be routed inside the panel as per the design calculation. The tube shall be double layered & made of Hi-tech Polymer either Fire Detec, Fire Trace or equivalent. The system shall utilize unique flexible tubing that shall be attached to the top of the container valve. This tubing shall be pressurized with Dry Nitrogen to 230 psig (≈16 bar) at 700F (1,034 KPA @ 210C), is temperature sensitive and shall act as a continuous linear thermal detector that shall rupture upon flame impingement. Once the detection tubing is ruptured, forming a nozzle at the rupture point, it shall allow the Clean Agent through the nozzle into the protected area. The clean agent offered should be as designated in NFPA 2001 (Section A.5.5.1(B)) and ISO 14520 Clean Agent Standards. Its 'ASHRAE' nomenclature is (FK5-1-12 or its equivalent (Novec 1230)). Gas should have lowest Global Warming potential. The quantity of clean agent required should be calculated as per NFPA 2001 and BIS standards. Clean agent container shall be designed, fabricated, certified with stamp on the containers in accordance with the requirements of NFPA. Containers shall be standard model and size for ease of replacement and addition. Fill containers with required Clean Agent (FK5-1-12 or its equivalent (Novec 1230)). Pressurise with Dry Nitrogen to 230 psig (≈16 bar) at 700F (1,034 KPA @ 210C). Container/cylinders shall have PESO approval /Govt. Approved Lab. A separate and stand alone gas cylinder with protection system shall be provided for a group of panels.	As per Bidder understanding, Fire protection system has been provided in 33kV panel, DC switchgears and Auxiliary Transformers only. Please confirm.	Please follow tender conditions
423.	TS Table: 3.1.8 SI.No.:1 / Interfacing Requirements with Underground E&M services Contractor /	Installation of 33 kV, 750 V DC cables, traction return cables and PLC cable for ETS connection and other control cables, earth strips/ earthing cables in station and tunnel area.	UG Section cable tray & supports are under the scope of E&M scope as per the LKE-02-01 requirement. Please confirm.	Please follow tender conditions
424.	/ General /	General	Increase in quantity beyond the specified scope shall be considered and paid based on the current market rates at the time of execution. Please confirm.	Tender condition shall prevail
425.	/ General /	General	The Contractor proposes to utilize the Client's handed-over tools and spare parts during the Defect Notification Period. These items shall be returned to the Client upon receipt of the replacement tools and spares from the OEM.	Please follow tender conditions
426.	Bill No.:10.1, C.1 / Maintenance Supervision /	General	Requested to confirm the No of supervisors required during DNP of 24 Months.	Please follow tender conditions
427.	3.5.2.2 / Design Verification and Validation Plan /	General	Rating/ Size/ Number of Runs/ Quantity of Various items Cables, Transformers, 33kV Panel, Battery, Battery charges, DC switchgear etc has been provided in TS/ Tender Drawing and Design Validations is in the scope of Contractor, Please confirm that after design validation contractor is allowed to optimize the No of runs, Size etc.	Please follow tender conditions
428.	ERGS Chapter 24 Clause 24.1(i) / FACILITIES FOR THE EMPLOYER'S REPRESENTATIVE / Four Wheel Vehicle	Two round the clock Four-Wheel-Drive vehicles, (Innova type or similar) to be provided at the commencement of the Works or as agreed by the Employer's Representative) with a long wheel base equipped with optional four- wheel drive, high and low gear ranges for round the clock service. It shall have an engine capacity of not less than 2000cc (nominal) and a seating capacity of no fewer than 5 persons.	Milestone for Employers facility for this item in not mentioned in the pricing document. Hence contractor assumed that this is not required. Please confirm the contractor understanding.	Bidder have to quote inclusive of all facilities as stipulated in ERTS/ERGS.
429.	General	Vendor Eligibilty / Criteria 1. The Vendor/ Manufacturer should have at least 10 Years of Experience for manufacturing equipment of the same rating or higher rating	It is understood that several global manufacturers have recently established manufacturing facilities in India, while their parent/global manufacturing units possess extensive experience exceeding the specified 10-year requirement. In view of the above, we understand that such vendors may be considered eligible to supply from Indian Factories based on the experience and credentials of their global manufacturing facilities, We will ensure that the same global standards, quality, and testing practices would be maintained. Kindly confirm	Please follow tender conditions
430.	General	Proven Experience Requirement: 2. The Manufacturer should have supplied similar system with satisfactory operation for a minimum of 5 years in a Monorail/Tram/Metro Project	Can supplies to any Govt. utility can be considered? Kindly confirm	Please follow tender conditions
431.	General	Depot ASS/TSS Building	We understand Depot ASS/TSS Building will be constructed by another contractor. Kindly confirm our understanding.	Bidder understanding is correct
432.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.22	TEST SHEET FOR 33 KV TRIPLE POLE VCB (GIS)	Note that the available type test reports shall be provided. Any additional or repetition of the type tests shall not be conducted. If it meet the IEC/Indian Electricity code guidelines. Please confirm.	Please follow tender conditions
433.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.4.4	All protection relay modules shall comply in accordance with the following IEC test requirements :'	Tested as per IEC 60255 series & IEC 61000 standard. Kindly Confirm	Please follow tender conditions
434.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.3.12	h) The relay should have USB/RJ 45 port for local communication with Laptop and RJ45 ports (with redundant port) to communicate on native IEC 61850 protocol for future integration .	Front RJ45 port available for local communication & dual redundant RJ45 port available for future integration. Kindly confirm	Please follow tender conditions
435.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.3.7	The relays shall include the tools for fault diagnostics. These tools shall have stored records for faults, events and disturbance. Disturbance shall be recorded for at least 5 sec. Faults and events shall be stored with resolution of 1 ms. Relays shall be capable of storing minimum of 100 disturbance records and 1024 events with overflow.	The relay has a nonvolatile memory capable of storing 1024 events with the associated time stamps. The relay is provided with a disturbance recorder featuring up to 12 analog and 64 binary signal channels. Kindly confirm	It will be decided during detail design stage with the approval from engineer at own cost
436.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.3.9	The Contractor shall furnish detailed proposal of batteries preferably in the Electrical Erasable Programmable Read Only Memory (EEPROM). This is to allow PCU settings to be changed in the foreground without affecting the actual operating values in the background.	The relay has a nonvolatile memory which does not need any periodical maintenance.The nonvolatile memory stores all events, recordings and logs to a memory which retains data if the relay loses its auxiliary supply. Kindly Confirm	Please follow tender conditions

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
437.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.3.11	Provision shall be made for easy isolation of trip circuits of each relay for the purpose of testing and maintenance by means of RTB (relay Test Block).	Relay can be tested in test mode. Kindly Confirm	Please follow tender conditions
438.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.19.1	A separate panel with complete metering and protection equipment shall also be acceptable subject to availability of suitable space in the room.	Kindly allow to provide the integrated type LVC instead of Separate panel for the same.	Please follow tender conditions
439.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.17.10.1	Cable connection shall be preferably top entry for elevated/UG station and for depot it may top or bottom entry as per Contractor's design. Cable termination shall be inner/outer cone plug in type with test plug/dummy plug available in switchgear for testing.	Note that we have considered the bottom cable entry for the UG stations and outercone type of cable termination kit. Kindly confirm	It shall be proposed by the the successful bidder during detail design with the approval from engineer at no extra cost.
440.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.17.12.4	All current transformers shall be installed with the P2 terminals adjacent to the busbars (refer tender SLDs).	Note that CT shall be installed on the bushing in the Incoming and Outgoing feeders. Kindly confirm	Please follow tender conditions
441.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.17.2.4	A shrouded push button for releasing the springs and an electrical release coil shall also be provided.	Such Shrouded push button for spring release is not available in MV GIS. Kindly Note	Please follow tender conditions
442.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.17.2.7	The electrical tripping and closing devices shall be operated satisfactorily, with a maximum temperature of 55°C inside the 33kV switchgear enclosure,	Note that panels are type tested at 40 deg C, above that derating shall be provided. Kindly Confirm	Tender conditions shall prevail
443.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.4.1.9	When there is provision for isolation of sections of cable between two "either-or" interlocked circuit breakers, a key-operated over-ride shall be provided to permit both circuit breakers to be closed at the same time provided that the circuit between them is broken. It shall not be possible to restore the connection without tripping one of the two circuit breakers and releasing the key.	Such key operated over ride feature is not possible in GIS. Kindly Confirm	Please follow tender conditions
444.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.16.4	The equipment installed shall offer all necessary facilities for equipping and connecting the equipments sections to follow, without entailing any shut down of equipment already in service.	Note that we do not recommend conducting any activities in live condition. Also note that the service condition is applicable for AIS. Hence the same is not applicable for GIS. Kindly Clarify	Please follow tender conditions
445.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.16.6	Suitable means of expansions should be provided in the metal enclosure and pipelines to absorb the actual thermal expansion and contraction of the SF6 equipment and to facilitate the alignment of the switchgear assembly.	Not applicable for the MV GIS. Kindly Confirm	Please follow tender conditions
446.	14.2.12 FOR UNDERGROUND SECTION - GAS INSULATED SWITCHGEAR (GIS) / 14.2.14.5	IS 3156 for PT, IS 2705 for CT or latest	Note that CT shall be as per IEC 61869-1&2 & for PT it shall be as per IEC 61869-1&3. Kindly confirm	IS 3156 or latest relevant equivalent IEC standards shall be followed for PT IS 2705 or latest relevant equivalent IEC standards shall be followed for CT
447.	12.3.3.2.7	Bus bars shall be supported	Some supplier offers bus bars that shall be self supporting & they shall be supported from spout bushing of the circuit breaker itself. Please note that the offered switchgear is type tested (including internal arc test) without bus bar support insulators. Hence, we do not envisage separate insulators for supporting the bus bars. Support less bus bar design is the new trend and is adopted by leading switchgear manufacturers globally. Kindly allow.	Please follow tender conditions
448.	12.3.3.3.1	21 Earthing isolator making capacity	From safety point of view, it is advisable to have making capacity of earthing switch equal to 2.5 times rated breaking capacity of switchgear. However, same is mentioned as only 25kA. Kindly reconfirm your requirement, it should be 62.5KA for 1Sec	Please follow tender conditions
449.	12.3.3.3.1	Allowable variation range of control supply voltage	Voltage variation shall be +/- 10%.Kindly Confirm	Please follow tender conditions
450.	12.3.3.2.7	Temperature rise of various parts of the switchgear shall be within limits	Temperature rise of various parts of the switchgear shall be within limits as per IEC for silver plated joints of the bus bars. Kindly Confirm	Please follow tender conditions
451.	12.3.3.2.12	The trolley shall have a control button and the open and closed position annunciation via mechanical display.	Please note that by annunciator, we infer visual indication. Kindly Confirm	It shall be proposed by the the successful bidder during detail design with the approval from engineer at no extra cost.
452.	General	Sub components of equipments	Various bought out sub components such as CT/PTs, meters, switches, MCB, relays, cables etc. shall be sourced from our regular approved vendors. We do not envisage obtaining approval for the same. Kindly confirm	Please follow tender conditions
453.	Vol-2-General Conditions of Contract- Clause 8.3-Delay	In case of delay on the part of the Contractor, the Contractor shall be liable to pay Liquidated Damages and any other compensation for the damages suffered by the Employer as per clause 8.5. This is without prejudice to the right of the Employer to rescind the Contract. Failure or delay by the Employer or the Engineer, to hand over to the Contractor the Site necessary for execution of Works, or any part of the Works, or to give necessary notice to commence the Works, or to provide necessary Drawings or instructions or clarifications or to supply any material, Plant or Machinery, which under the Contract, is the responsibility of the Employer, shall in no way affect or vitiate the Contract or alter the character thereof; or entitle the Contractor to damages or compensation thereof but in any such case, the Engineer shall extend the time period for the completion of the Contract, as in his opinion is/are reasonable.	We take reference to the NDB funded Indore Metro Third Rail Tender Clause 20.2 of GCC and further amendment wherein Contractor is entitled for Claims For Payment and EOT for delay as a result of a failure by the Employer to give any such right or possession We request that similar provisions may kindly be incorporated in the present Contract expressly to provide entitlement to both Extension of Time and reimbursement of additional costs incurred by the Contractor due to delays, hindrances, disruptions or suspensions attributable to the Employer, the Employer's Personnel, or other agencies engaged by the Employer. As such events are beyond the Contractor's control and may result in prolongation costs, idle resources, reduced productivity, and additional overheads, restricting the Contractor's entitlement solely to Extension of Time would result in an unbalanced allocation of risk. Accordingly, we request confirmation that the Contractor shall be entitled to claim and additional costs, together with Extension of Time, for delays attributable to the Employer and other applicable provisions of the Contract.	Tender condition shall prevail
454.	General	Pre Bid Meeting SCADA Scope Discussions	We understand that as per discussions regarding SCADA in prebid meeting, their will be no change for field equipments for NS corridor. We also understand that BCC for NS Corridor will be at existing Transport Nagar depot SCADA OCC and BCC for EW corridor will be at Vasantkunj Depot. Further OCC for NS and EW Corridor will be at Sachivalya. Kindly confirm our understanding and provide detailed and exhaustive SCOPE for it.	For new SCADA works, Please Refer Chapter 18(l) . For Upgradation works please refer Chapter 18(II) & (I) both.
455.	General	Alignment Details	Kindly Provide civil alignment drawings for us to optimize and derive exact quantities for 3rd Rail.	Please refer addendum 2 (Sectioning arrangement drawing)
456.	Amendent 2 Drawings	Dwg No AGCC01-11718A-TDR-C01-TR-PWR-71940 / AGCC01-11718A-TDR-C01-TR-PWR-71939	As per drawings 3rd rail installation at scissor with 4.6 mtr Track centre is shown having type of 1:9, R300, this may cause dead zone in mainline and also at Depot and Mainline ramp connection area. Hence we recommend to use scissor crossover with type of 1:7, R190 . same is installed in Indore and Bhopal to prevent deadzone. Kindly consider.	Tender conditions shall prevail
457.	General	Simulation Studies	Kindly provide tentative simulation studies conducted by client as it would help in ascertaining the ratings in better way as at this moment due to detailed RS data we cannot conduct simulation studies on our own. Kindly consider.	It will be shared to successful bidder only.
458.	General	CRP	We understand that there will be no standalone CRP in RSS/AMS as the incoming feed in of 33 kV and corresponding panels have inbuilt relays. Kindly confirm	Requirement of this control panel feasibility will be decided by the successful bidder during detailed design stage and to be implemented (if required).
459.	General	SAS	Kindly clear the requirement of Local SAS in RSS/AMS at Vasantkunj depot.	Please follow tender conditions

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
460.	Bid Submission Extension	Bid Submission due date: 29th June 2026	Considering that this is a Design and Build contract, the bidder is required to undertake detailed quantity assessments, design requirements, evaluate the implications of pre-bid clarifications and addendato be issued, and obtain competitive quotations from multiple equipment suppliers and vendors. In view of the above and to enable bidders to carry out a comprehensive technical and commercial evaluation, we request the Employer to kindly extend the bid submission date by at least four (4) weeks. Such an extension will facilitate the submission of a well-evaluated, competitive, and technically robust bid in the best interest of the Project. Kindly consider our request favourably.	Please refer Addendum 3
461.	General	Depot Layout	Kindly provide depot combined service drawing (Cable trench layout drawings) for us to calculated cable lengths for the depot scope of work.	Please refer addendum 4
462.	General	Loading Platform	Since loading platforms are not shown in drawing, we understand that loading platforms will be provided by customer.	Please refer addendum 2
463.	Chapter 18 cl no. 18.4.1.13	SCADA system proposed for EW corridor shall be smoothly integrated & commissioned with existing North South corridor SCADA system at OCC and respective BCC including SAS at both RSS (TPNR RSS & MSPA RSS) for seamless operation	As we understand that E-W corridor RTUs shall be smoothly integrate & commissioned with new separate SCADA system at OCC Metro Bhawan or common SCADA system at OCC for both corridor and new SCADA system at Vasant Kunj BCC. Existing RSS shall be integrated with N-S corridor new SCADA system at OCC. Kindly confirm and clarify the same.	For new SCADA works, Please Refer Chapter 18(I) . For Upgradation works please refer Chapter 18(II) & (I) both.
464.	Chapter 18 cl no. 18.4.1.14	Any addition/modification/upgradation at hardware level as well Software level (at each level and layer) required for integration of North South Corridor and East-West corridor SCADA will be covered	As we understand that integration of SCADA system for E-W corridor shall be common or separate SCADA system installed at OCC metro Bhawan and BCC at Vasant Kunj. Modification/upgradation of SCADA system required for N-S corridor at BCC, TPNR RSS and MSPA RSS and integration with separate SCADA system at OCC for N-S corridor. Kindly confirm and clarify the same.	Seperate SCADA Servers for NS and EW corridor at OCC
465.	Addendum-2 technical compressed Annexure-18	OCC Architecture	As we understand that SCADA system proposed at OCC is common server or separate server shall be used. Kindly confirm and clarify the same.	Please refer S. No. 464
466.	Chapter 18 cl no. 18.14.2.9.1	Traction contractor shall interface with designated S&T contractor for the requirement of Uninterrupted Power Supply (UPS) feeder for Traction SCADA system at OCC	As we understand that UPS, supply, installation & commissioning by S&T contractor at OCC only. Kindly confirm scope of supply of UPS at BCC for E-W and RSS	For RSS , Please refer chapter 12 Vol 4 ERTS
467.	Chapter 18(II)	Up-gradation of existing SCADA System (Make-ABB) installed at BCC server room, TPNR RSS & MSPA RSS of Lucknow Metro	AS we understand that, up-gradation of existing SCADA system at BCC TPNR, TPNR RSS and MSPA RSS for N-S corridor only. For N-S corridor RTU communicate with New separate SCADA system provided at OCC. Kindly confirm and clarify the same.	Bidder's understanding is correct
468.	Chapter 18 cl no 18.6.5.3	Relay & Protection Panel – The Numerical relays shall be communicating with RTU over IEC 61850 protocol. The relays data shall be collected by RTU and transmitted to SCADA server in OCC/BCC. The Relay & Protection Panel shall be supplied and installed by traction power supply contractor. Interfacing with the power supply contractor/UPMRCL shall be done for relays protocol compatibility.	As we understand that Relay and protection panel shall be communicate with RTU over IEC-61850 protocol at RSS/AMS, ASS/TSS and ASS. Please confirm the redundant path protocol either it is PRP or HSR protocol.	Successful bidder to propose and take approval from engineer during detailed design stage at own cost.
469.	Addendum-2 technical compressed cl no. 18.6.5.2	FO cable from RTU to TER is in Traction Contractor Scope.	Please confirm the FO cable Type from RTU to TER.	Successful Bidder shall has to submit functional design scheme and take approval from engineer during detailed design stage at own cost.
470.	Addendum-2 technical compressed Annexure-18	SCADA system architecture BCC	As per architecture drawing BCC is not connected with backbone communication network. Please confirm it is connected with backbone network or directly connected to OCC ethernet switch.	Please refer addendum-4 (Tender drawing)
471.	Addendum-2 technical compressed Annexure-18	SAS architecture RSS	Please confirm the RSS communication connection with backbone.	Please refer addendum-4 (Tender Drawing)
472.	Addendum-2 technical compressed Annexure-18	OCC architecture drawing	As per TS web server and 3 rd firewall is not mentioned for N-S corridor and E-W corridor but in architecture it is mentioned. kindly confirm and clarify the same.	Please refer addendum-4 (Tender Drawing)
473.	Chapter 18 cl no.18.11.2.7	ETS Control Cable of fire survival type to RTU	AS we understand that ETS control cable from ETS to RTU shall be fire survival only. Kindly confirm and clarify the same.	Please follow tender conditions
474.	Chapter 18 cl no.18.11.2.4	ETS power supply for blue light station	Please confirm power supply type for blue light station it is AC supply or DC supply and clarify the scope.	110 volt DC Supply
475.	Chapter 18 cl no.18.12.1.2	It shall have necessary communication ports for communication with both AC & DC numerical relays/IEDs on IEC 61850 protocol with provision of redundant ports and communication modules.	As we understand that common port shall be used for AC& DC numerical relay/IED communication with redundant port and communication modules. Kindly confirm and clarify the same	Please follow tender conditions
476.	Addendum-2 technical compressed Annexure-18	Vasant Kunj RSS RTU communication architecture drawing	Please provide the RSS RTU architecture drawing.	Please refer addendum 2
477.	General	33kV incoming Cable from GSS to RSS	The 33kv infeed cable from the GSS to the RSS is covered neither in the BOQ nor in the scope of work. We understand that 33kv infeed cable is in the scope of PST contractor. Please confirm .	It is not in scope of bidder.
478.	General	Station architectural drawing elevated UG station.	This drawing would enable us to calculate the AC and DC cable length. So, Please arrange to provide.	Successful Bidder has to interface with the concerned contractor regarding this.
479.	Chapter 14 Cl. 14.7	Via-duct Lighting Drawing	Please. provide Via-duct lighting Drawing.	Please refer addendum 4
480.	General	ETS	Emergency Tripping Systems (ETS) shall be provided at the tunnel cross passages. Therefore, the exact locations of these cross passages are required to calculate the total number of ETS units and their associated cabling. Please provide.	It will be provided to sucessful bidder only
481.	General	ETS	Please provide the number of ETS units to be considered for the depot.	Successful Bidder has to follow metro's standard practice. No extra payment shall be made.
482.	Tender Drawing	Depot Layout (LKO PH_1B/GAD/SHEET-14 OF 14) provided in the Addendum-2.	The provided drawing is not completely legible. While we are able to locate the RSS within the depot layout, we cannot identify the location of the depot TSS. Kindly provide a high-resolution, legible drawing that clearly shows the depot TSS.	Please refer Addendum 4 (Tender Drawing)
483.	Tender Drawing	Depot Layout (LKO PH_1B/GAD/SHEET-14 OF 14) provided in the Addendum-2.	Please mark the available area for RSS in the provided depot layout.	Please refer addendum 2 (Tender drawing)

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply																																													
484.	Tender Drawing	Depot Layout (LKO PH_1B/GAD/SHEET-14 OF 14) provided in the Addendum-2.	Please mark the available area for depot TSS in the provided depot layout.	Please refer Addendum 4 (Tender Drawing)																																													
485.	Drawing	Depot Layout (LKO PH_1B/GAD/SHEET-14 OF 14) provided in the Addendum-2.	Please provide the depot cable route from depot TSS to various switches (dis-connectors)	Please refer addendum 4																																													
486.	Tender drawing	Depot TSS Equipment Layout (LKDDC02-TDR-GEN-PST-DWG-XXXX	In the provided equipment layout two traction and two rectifier have shown. However, in the depot SLD the same were three numbers. Pl. Confirm which one is correct. There is one panel shown as meter assembly. Please confirm the requirement.	Please refer addendum 2																																													
487.	Tender Drawing	Cable Cut-out drawing.	Kindly provide a typical cable cut out drawing for our reference.	Successful Bidder has to interface with the designated contractor regarding this.																																													
488.		<table><tr><th>Sl. No</th><th>Station/ Equipment Name (From)</th><th>Station/ Equipment Name (To)</th><th>Section Location (Elevated/At Grade/UG)</th><th>Type (FRLS/ FRLSOH)</th><th>Total Runs & 33kV AC RSS/Depot/ Ring Cable Size</th></tr><tr><td colspan="6">East West Corridor Cable sections from RSS/AMS to Stations</td></tr><tr><td>12</td><td>Vasantkunj RSS/ AMS</td><td>Vasantkunj</td><td>At-grade/ Elevated</td><td>FRLS</td><td>Double Circuit 6R#1Cx300sq mm</td></tr><tr><td colspan="6">East West Corridor Cable sections from RSS to Depot ASS+TSS</td></tr><tr><td>13</td><td>Vasantkunj RSS</td><td>Vasantkunj Depot ASS+TSS</td><td>At-grade/ Elevated</td><td>FRLS</td><td>Double Circuit 6R#1Cx300sq mm</td></tr></table>	Sl. No	Station/ Equipment Name (From)	Station/ Equipment Name (To)	Section Location (Elevated/At Grade/UG)	Type (FRLS/ FRLSOH)	Total Runs & 33kV AC RSS/Depot/ Ring Cable Size	East West Corridor Cable sections from RSS/AMS to Stations						12	Vasantkunj RSS/ AMS	Vasantkunj	At-grade/ Elevated	FRLS	Double Circuit 6R#1Cx300sq mm	East West Corridor Cable sections from RSS to Depot ASS+TSS						13	Vasantkunj RSS	Vasantkunj Depot ASS+TSS	At-grade/ Elevated	FRLS	Double Circuit 6R#1Cx300sq mm	We understand 3R#1CX300 Sqmm double circuit will be considered in place of 6R#1CX300 Sqmm double circuit from RSS to Depot. Please confirm.	Bidder's understanding is correct. Please refer addendum															
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489.		17.7.4.2.1 The 33 kV, 3-phase, 3-wire supplies from the 33 kV RSS, which have the star points of the secondary windings, shall be earthed to the Lucknow Metro (East West Corridor Phase 1 B) RSS earth system via 19 Ω neutral grounding resistor (NGR) to limit the earth fault current to a value compatible with the system earthing resistance.	As there is no transformer in the RSS, this point is not applicable. Please confirm.	Bidder's understanding is correct																																													
490.	Chapter 13 33kv cable technical specification	<table><tr><th colspan="3">Table 13.2: 33kV Cable Rating</th></tr><tr><th>SN</th><th>Description</th><th>33kV Cable Rating</th></tr><tr><td>1.</td><td>Type</td><td>Dry insulated, radial field</td></tr><tr><td>2.</td><td>Conductor cross section</td><td>300mm² & 120 mm²</td></tr><tr><td>3.</td><td>Conductor material</td><td>Aluminium</td></tr><tr><td>4.</td><td>No. of cores</td><td>1</td></tr><tr><td>5.</td><td>Fire Retardant Property (Conforming to UTE Standard 32 700, test N°2, IEC 60502-1 or equivalent)</td><td>FRLS for elevated, at-grade sections & depots FRLSOH for UG stations</td></tr><tr><td>6.</td><td>Rated voltage</td><td>U0/U (Um) = 19 / 33 (36) kV (Suitable for use in 33kV earthed system)</td></tr><tr><td>7.</td><td>Maximum Voltage</td><td>36 KV</td></tr><tr><td>8.</td><td>Neutral</td><td>Earthed through NGR of 19 ohm</td></tr><tr><td>9.</td><td>Frequency</td><td>50 Hz</td></tr><tr><td>10.</td><td>Short circuit current carrying capacity of conductor</td><td>16 kA for 3 sec</td></tr><tr><td>11.</td><td>Short circuit current carrying capacity of metallic screen</td><td>1 kA for 3 sec</td></tr><tr><td>12.</td><td>Permissible Frequency variation</td><td>± 3%</td></tr><tr><td>13.</td><td>Rated short circuit duration power</td><td>70 kV rms</td></tr></table>	Table 13.2: 33kV Cable Rating			SN	Description	33kV Cable Rating	1.	Type	Dry insulated, radial field	2.	Conductor cross section	300mm² & 120 mm²	3.	Conductor material	Aluminium	4.	No. of cores	1	5.	Fire Retardant Property (Conforming to UTE Standard 32 700, test N°2, IEC 60502-1 or equivalent)	FRLS for elevated, at-grade sections & depots FRLSOH for UG stations	6.	Rated voltage	U0/U (Um) = 19 / 33 (36) kV (Suitable for use in 33kV earthed system)	7.	Maximum Voltage	36 KV	8.	Neutral	Earthed through NGR of 19 ohm	9.	Frequency	50 Hz	10.	Short circuit current carrying capacity of conductor	16 kA for 3 sec	11.	Short circuit current carrying capacity of metallic screen	1 kA for 3 sec	12.	Permissible Frequency variation	± 3%	13.	Rated short circuit duration power	70 kV rms	Please. confirm the short circuit current rating for 33kv cable and its metallic screen fault current rating as there is no transformer with NGR in RSS. Please. confirm.	Bidder's understanding is correct
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491.	Pricing document Annexure- 26 included in the addendum.	<table><tr><th>Item No.</th><th>BOQ Item Description</th><th>Explanation (BOQ Bill No. 4.1 – 33 kV HT Cables)</th></tr><tr><td>A.1.1</td><td>Supply, laying, testing and commissioning of 33 kV FRLS/ FRLSOH Cables and connections between ASS&TSSs ring for elevated / UG / At Grade section along with Cable support infrastructure, Joints and terminations, Fittings, terminals, intertripping cable & other components, for completion of job as per specifications and tender drawings.</td><td>• 33kV cable as per specification from feeder CB in RSS/AMS to incoming CB in ASSTSS (including Depot) • 33kV cable from UPPCL/DISCOM's Metering Panel to Vasantkunj RSS/AMS to Incoming CBs of Vasantkunj RSS/AMS • ASSTSS to ASS/TSS • 33 kV CB to Aux Transformer & Traction Transformer in RSS/AMS, ASS/TSS. • Control cables for protection, interlocking, inter tripping & pilot wires.</td></tr></table>	Item No.	BOQ Item Description	Explanation (BOQ Bill No. 4.1 – 33 kV HT Cables)	A.1.1	Supply, laying, testing and commissioning of 33 kV FRLS/ FRLSOH Cables and connections between ASS&TSSs ring for elevated / UG / At Grade section along with Cable support infrastructure, Joints and terminations, Fittings, terminals, intertripping cable & other components, for completion of job as per specifications and tender drawings.	• 33kV cable as per specification from feeder CB in RSS/AMS to incoming CB in ASSTSS (including Depot) • 33kV cable from UPPCL/DISCOM's Metering Panel to Vasantkunj RSS/AMS to Incoming CBs of Vasantkunj RSS/AMS • ASSTSS to ASS/TSS • 33 kV CB to Aux Transformer & Traction Transformer in RSS/AMS, ASS/TSS. • Control cables for protection, interlocking, inter tripping & pilot wires.	We understand that metering will be considered in the CRP panel instead of separate metering panel. Please confirm.	Please follow tender conditions																																							
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492.	Vol 2, GCC Clause No. 2.2	Access to and Possession of the Site - For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account.	We understand that the civil contracts for the underground section are yet to be awarded. Considering the present status, we do not envisage completion of the associated civil works within the current contractual completion period of 42 months. Accordingly, we understand that the overall duration of this contract is likely to extend to not less than 60 months (from our past experience of similar projects). In view of the above, we kindly request you to make the necessary amendments to the Contract to suitably reflect the anticipated project duration.	Tender Conditions shall be followed																																													
493.	Vol 2, GCC Clause No. 2.2	Access to and Possession of the Site - For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account.	We request that in case of substantial delay attributable to the Employer affecting project execution, resource deployment, or causing idling/escalation, the Contractor shall also be entitled to reimbursement of proven additional costs incurred due to such delay, in addition to extension of time.	Please follow tender conditions																																													
494.	Vol 1 NIT_ITT_FOT Clause No. 1.2	Tender Security / EMD - The instrument type for payment of tender security/ EMD shall be Demand Draft, Bank Guarantee, RTGS, NEFT & IMPS. No other mode of payment will be accepted.	As per Circular issued by Govt. of India, Insurance Surety Bonds are recognized as an acceptable alternative to Bank Guarantees for Bid Security and Performance Security. Request you to please consider the same. The Circular is enclosed with our queries for ready reference.	Tender conditions shall prevail																																													
495.	NIT 1.2 Key Details Clause No. 1.2	Tender Security - Rs. 5.83 Crores	We note that the EMD value is stipulated as 2% of the estimated tender value. We request the Employer to consider reducing the EMD to 1% of the estimated value, in line with previous projects, as the present requirement leads to substantial financial blockage and increased bank guarantee costs, thereby impacting the overall project costing and cash flow management for the Contractor.	Tender conditions shall prevail																																													
496.	Vol 4_ ERTS Clause No. 3.1.15	Interface with Govt Agencies - Obtaining all permission from road agency and other agencies for digging along road/ pavements as necessary. Restoration of sites, roads as required under the local laws. Interface with Telecom authorities, Gas Distribution Authorities and other agencies to ensure that functioning of the utilities is not jeopardized by the actions of the contractor.	We understand that the permission from the relevant government authorities is in contractor's scope. However, the restoration amount and any supervision charges shall be paid to these agencies by UPMRCL or shall be reimbursed to contractor at actuals by UPMRCL.	Tender conditions shall prevail																																													

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
497.	Vol 1 FOT Appendix -1 A Vol 2, GCC 8.5	The total amount of Liquidated Damages in respect of the Works in all stages shall, however, not exceed the limit of 10% of total Contract Value as stated in the Appendix-1 to the Form of Tender. The aforesaid Liquidated Damages do not, however, include the sums payable by the Employer to Designated Contractors on account of delay caused by the Contractor to Designated Contractors. Such sums shall be recoverable from the Contractor in addition to any Liquidated Damages payable under this clause, the total ceiling limit of which is 15% of the Contract value including Liquidated Damages levied under the provision of Appendix 1 to the Form of Tender. The Liquidated Damages may be recovered from any amount of money due from the Contractor under the Contract or any other Contract which the Contractor has with the Employer. The Liquidated Damages may also be recovered from the amount of Performance Security Bank Guarantee and in that case the Contractor would be liable to replenish the amount of Performance Security Bank Guarantee.	We note that the LD for delay is 10% of the Contract Value. However, the provision allowing extension of LD up to 15% for recovery of damages caused to Designated Contractors exposes the Contractor to additional risk. We request that the maximum cumulative LD under the Contract shall be capped at 10% of the Contract Value only.	Tender conditions shall prevail
498.	Vol 1 NIT_ITT_FOT Clause No. 1.3	This tender is likely to be financed from Bilateral/ Multilateral financing institution or shall be financed through an equity participation by the Government of India and Government of Uttar Pradesh and other appropriate means. The procurement guidelines of the funding agency (Bilateral/Multilateral financing institution) shall be followed.	1. It is understood that the project may be funded by a Bilateral/Multilateral financing institution or government agency. We request the Employer to kindly confirm the funding source and payment mechanism, as clarity on the same is essential from the Contractor's perspective. 2. If Bilateral/ Multilateral financing institution funding is used, the tender process will follow the procurement Guideline of that funding agency. Also No such guidelines are provided in tender. We request to provide the same.	New Development Bank
499.	Vol 2 GCC & SCC Clause 4.2.4	Within 30 days of the date of Letter of Acceptance of the Tender, the Contractor shall submit to the Employer i)An Undertaking in the approved format from a Parent Company the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection. (ii)A written Guarantee in the approved format from a Parent Company, the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection. (iii)A written Warrantee in the approved format from the Contractor. In the event that the Contractor shall comprise two or more members, corporations acting in partnership, joint venture, consortium or otherwise each such member or corporation shall submit a Parent Company Undertaking and Guarantee. Notwithstanding any other provision of the Contract: a)Submission by the Contractor of the requisite Performance security, Parent Company Undertakings and written Guarantees shall be condition precedent to the Contractor's entitlement to any payment, under the Contract; and b)Failure by the Contractor to provide a Performance Security or Parent Company Undertakings or Parent Company Guarantees shall entitle the Employer either to suspend the Works or to terminate the Contract forthwith by notice in writing to that effect, notwithstanding that the Contractor may have been permitted to proceed with the Works, and the Contractor shall not be entitled to any compensation whatsoever as a consequence of such suspension or termination.	1.We understand that parent company undertaking as per provision (i)& (ii) are not applicable to us.so hence we are not submitting any such undertaking. Kindly confirm. 2.Submission of such undertaking & warranty by contractor shall not be a condition precedent for payment to contractor & This shall not be ground for the Employer for suspension and termination of the contract .We request deletion of this clause.	Please follow tender conditions
500.	Vol 2 GCC & SCC Clause 4.2.4	The forms of Contractor's Warranty , Parent Company Undertaking, Parent Company Guarantee, , Sub-Contractor's/vendor's Warranty, Indenture for Stage Payment and Safe Custody Guarantee shall be in the formats given in the Schedules 1, 2, 3, 4, 5 and 6 respectively to these Special Conditions of Contract. All these Guarantees and Undertakings should be submitted before signing of the contract agreement except Sub Contractor's Warranty, Advance Payment Bank Guarantee, Indemnity Bond and Safe Custody Bank Guarantee which will be required as per contract conditions. The amount of safe custody Bank Guarantee shall be equal to 95% percent of the amount due as per the relevant clause of (BOQ) wherever applicable. The value of the Safe Custody Bank Guarantee would be adjusted for the equipment already commissioned.	The Contract requires submission of a Safe Custody Bank Guarantee by the Contractor equal to 95% percent of the amount due as per the relevant clause of (BOQ) wherever applicable. There is no clarity whether this Guarantee is applicable to us. Please note that this will be additional financial exposure to contractor in addition to performance security. We request deletion of this clause.	Not applicable to traction
501.	Vol 2 GCC 14.1 SCC 27 Clause No.	The Contractor shall indemnify and hold harmless the Employer, the Engineer, the Designated Contractors, Representatives and employees from and against all actions, suits, proceedings, claims, damages, losses, expenses and demands of every nature and description, by reasons of any act or omissions of the Contractor, his Representative or his employees in the execution of the Works, including professional services provided by the Contractor or in the guarding the same. These indemnification obligations shall include but not be limited to claims, damages, losses, damage proceedings, charges and expenses which are attributable to: a)Sickness, or disease, or death of, or injury to any person; and b)Loss of, or damage to, or destruction of any property (other than the Works) including consequential loss of use; and c)Loss, damage or costs arising from the carriage of Plant, Rolling Stock and Materials and/or ownership or chartering of marine vessels by the Contractor, or any Sub-contractor of any tier. The Contractor shall also indemnify and save harmless the Employer from and against all claims and proceedings on account of infringements of patents rights, design, trademark name etc. as detailed out in clause 5.8. All sums payable by way of compensation under these conditions shall be considered reasonable compensation payable to the Employer, without reference to the actual loss or damage sustained, and whether or not any damage shall have been sustained. The decision of the Engineer as to compensation claimed shall be final and binding.The contractor shall submit a Indemnity Bond as per format consented by UPMRC against payments made for Plant and Equipment delivered to Lucknow.	1. The indemnity provision is presently one-sided and places obligations solely on the Contractor. We request that the clause be amended to incorporate mutual indemnity provisions, whereby the Employer shall also indemnify and hold harmless the Contractor against losses, damages, claims, liabilities, costs, and expenses arising from the Employer's acts, omissions, breaches, third-party actions attributable to the Employer, and the acts or omissions of the Employer's designated contractors, agents, or representatives. 2. Further, any amount payable by the Contractor pursuant to the indemnity provisions should constitute the Employer's sole and exclusive remedy and be treated as full and final compensation for the relevant loss or damage. Accordingly, we request deletion of the highlighted provisions that provide for additional or overlapping remedies beyond such compensation.	Tender conditions shall prevail
502.	Vol 2 SCC Sch 1 - Contractor Warranty Clause No. 10.1	Defect liability period shall be 24 months from the date of issue of taking over certificate. During the Defects Liability Period the Contractor shall provide, free of cost, competent and skilled personnel and maintain adequate stock of spares so as to promptly fulfil his obligations during the Defects Liability Period as laid down in GCC and Employer's Requirements. A penalty of Rs.10000/- per day in DLP period will be imposed if major equipment (as defined in the contract documents) or any complete system is not working for more than 24 Hrs. - RAMS Availability Target if not met then DLP shall increase as per the availability clause (clause no. 2.6.2- Volume-4) for maximum up to 3 years (2+1) - DLP of the equipment: If any equipment is required to be replaced/undergo major repairs due to defects/failure during the DLP then guaranty/warranty of such equipment shall be 24 months from the date commissioning of new equipment. If there is any balance period in such guaranty/warranty from the OEM at the end of DLP, such balance guaranty/warranty period shall be transferred to the Employer "He will replace free of cost to the Employer any defect or failure of equipment provided in the Works for a period of 36 months from the date of Taking Over of the last Section of the Works"	1.please note the provisions of penalty in DLP period which may add to financial burden of contractor if not complied. We request deletion of this clause. 2.We need more clarity on the period of extended DLP since it appears that there is difference between SCC provisions and provision of Schedule 1 Contractor Warranty highlighted in blue.	Tender conditions shall prevail
503.	Vol 2 GCC Clause No. 4.2.2 & 4.2.3	The forfeiture of the Performance Security amount by the Employer would be without prejudice to any amount(s) of money that the Employer may recover as Liquidated Damages or any other damages from the Contractor. The forfeiture of Performance Security amount by the Employer, would not operate as bar/set off/ adjustment from any amount of money which becomes recoverable or is recovered by the Employer. In case of the Performance Security Amount Bank Guarantee being invoked and forfeited by the Employer, the Contractor would immediately replenish the amount of Performance Security Bank Guarantee. Release of performance security - i)On completion of the entire Work/part Work, one half of the proportionate Performance Security shall be refunded to the Contractor, on issue of Taking Over Certificate/part Taking over Certificate by the Engineer ii)The balance Performance Security amount shall become due and shall be paid to the Contractor on certification of performance of the Contractor by the Engineer or authorised officials of the Employer stating that no defect is pending after the expiry of the final Defect Liability Period The Performance Guarantee should be valid for a period of 6 (six) months beyond the Defect Liability Period. Further claim period of BG shall be 6 months beyond the expiry date of BG.	1.As per GCC provision 4.2.2, the contractor is required to replenish the amount of forfeited performance security which will be additional financial burden to the contractor. We request deletion of this clause. 2.As per blue highlighted provisions there seems inconsistency in the release of performance security.as per provisions of FOT ,PBG is to be maintained for 6 months beyond DLP where as per GCC 4.2.3 release of partial performance security is allowed on TOC. Kindly clarify the same. We request that provisions of GCC 4.2.3 shall prevail.	Please follow tender conditions
504.	Vol2 GCC Clause No. 10.1	The expiry of Defect Liability Period would not absolve the Contractor from any liability under the Law and Contract arising from any hidden / latent defect in the Works / Section executed under the Contract by the Contractor. The Employer would be entitled to recover from the Contractor any compensation / damages / loss arising from such hidden / latent defect in the Works executed by the Contractor.	There is no explicit period mentioned during which contractor is liable to fulfil obligation of latent Defects . However the employer intends to recover losses and damages from such latent defects wherein the period of latent DLP is not defined & Contractor cannot be held liable for indefinite period .We request to specify the period of latent DLP & delete the provision of recovering compensation during such latent DLP.	Tender conditions shall prevail
505.	Vol 1 GCC Clause No. 11.2.1	a) Mobilisation Advance shall be generally limited to 5% of Original Contract Value payable in two equal instalments. b)Mobilisation Advance shall be paid interest free against acceptable Bank Guarantee from a scheduled commercial bank in India. The value of Bank Guarantee taken towards security of "Mobilisation Advance" shall be 110% of the Advance taken by the Contractor. The Contractor, once the 50% of Mobilisation Advance has been recovered, shall have a one-time option to reduce the Bank Guarantee for the Mobilisation Advance by the amount recovered. Following is added in the GCC Clause 11.2.1 (a) Mobilisation advance = 10% of the contract value.	1.In GCC it is specified that mobilisation advance is 5% of Contract value where as in SCC it is 10% of Contract value. We understand the SCC provision of 10% of contract value shall prevail.	Tender conditions shall prevail

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
506.	Vol 2 GCC Clause No. 12.1	All Variations shall be recorded in a written instruction from the Engineer either as a Contractor's Variation or as an Employer's Variation, and shall not be implemented by the Contractor without such an instruction in writing from the Engineer. No Variation shall in any way vitiate or invalidate the Contract. The Contractor shall not make any alteration and/or modification of the Works, unless and until the Engineer instructs or gives consent to a Variation. If the Construction and/or Manufacture Documents or Works are not in accordance with the Contract, the rectification shall not constitute a Variation. Changes to any sequence, method or timing of manufacture, construction, execution, supply, installation, testing and commissioning including Integrated Testing and Commissioning and changes to any part of the Site or access thereto will not constitute a Variation. However, during execution of work, if any variation in quantities leads to vitiation, the total amount payable to the contractor (To whom contract is awarded) shall be restricted to the amount worked out as per the offer of next lowest bidder's for actually executed quantities. Therefore before executing such variation, the "No objection for acceptability of rates" shall be obtained from the contractor. Engineer in charge shall ensure that, in case of vitiation, the payment is regulated as above.	1.We request the Employer to kindly delete this clause, as changes in sequence, methodology, timing, site access, or testing/commissioning requirements can have significant impact on the Contractor's cost, resources, productivity, and overall project schedule. Such changes are beyond the Contractor's control and should qualify for appropriate compensation and/or extension of time under the Variation provisions of the Contract. 2.With respect to blue highlighted provision it is observed that in case of variation in Contract the overall contract price will be restricted to the offer price of next lowest bidder. Hence in this case the Contractor is not sufficiently compensated. Also the variation which arises during execution phase, the valuation of such variation shall be based on current market rates and not on offer based during bidding stage.	Please follow tender conditions
507.	Vol 2 GCC Clause No. 12.5	GCC 12.5 - Variation in the Bill of Quantities b) In case, an increase in quantity of a particular Schedule of BOQ by more than 25% of the agreement quantity is considered unavoidable, then same shall be executed at following rates: (i). Quantities operated in excess of 125% but up to 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender; (ii). Quantities operated in excess of 140% but up to 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender; (iii). Quantities operated beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender. (iv) Variation to quantities of Minor Value Item/ other items not covered in any Schedule of BOQ: Note: The variation limit of 25% would be applicable on group of items and not on individual items. The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed in (b) above). A minor value item for this purpose is defined as an item whose original agreement value is less than 1% of the total original contract value.	1. As per GCC 12.5 it is observed that in case of increase in quantities, the Contractor is being compensated at decreased rates to the extent of 96% of original rates. Hence the very purpose of variation and its related compensation/valuation is defeated. We request client to asses such variation in quantity based on market rates. 2. As per blue highlighted provision We request the Employer to kindly reconsider the provision allowing quantity variation up to 100% for minor value items. Even though such items may individually constitute less than 1% of the Contract Value, substantial variation in quantities can significantly impact procurement planning, resource allocation, inventory management, and execution costs. Accordingly, we request that the variation limit for such items be restricted to ±25%, in line with other BOQ items under the Contract.	Please follow tender conditions
508.	1.4.2 Minimum Eligibility Criteria: A. Work Experience: Clause No. A. Work Experience: Key Activity E: SCADA	Key Activity E: SCADA Supply, installation, testing & commissioning SCADA System for Metro Rail/ Suburban Rail/ Main line Railways/ Mono Rail/Tramways for minimum length of nine Track km (9 Tkm) Subcontractor is permitted only for Key Activity item 2(e). For all other key activities primary contractor shall be responsible either as a single entity or as JV/Consortium	As per clause 2.7. Vendor Approval and Selection Procedure, Equipment's for SCADA System, Page 18 of 18 of chapter 2, Volume 2 "Proposed Vendor/ Manufacturer should have supplied the same with satisfactory operation for 5 years in a Mono rail/Tram/Metro Project". We request UPMRCL to kindly clarify on the ambiguity on SCADA supplier credentials provided under the 2 different clauses of the tender document i.e eligibility criteria and vendor approval.	Both conditions shall be followed
509.	Vol 2 GCC Clause No. 2.3	It shall be Contractor's exclusive responsibility to get approvals, permits or license required for the Contract. However, the Employer may (where he is in a position to do so) provide reasonable assistance to Contractor at the request and cost of the Contractor in getting Permits, License or Approvals required during the Contract. The rendering of such assistance by the Employer shall not be interpreted as a pretext by the Contractor as condoning of any delay or non-performance of any of the Contractors obligations. The following-up of all such applications shall be the responsibility of the Contractor	It is understood that contractor is liable to obtain all approvals, permits or license required for the Contract, which may result in additional time and cost implication to contractor. Hence, we request that this responsibility shall be taken up by Employer.	Tender conditions shall prevail
510.	Vol 2 GCC Vol 1 ITT Annexure -2 clause (2) vol 3 ERGS Clause No. GCC 2.2 Annexure 2 Clause 2 Vol 3 - 1.3	The Employer shall provide the Site/area of works and shall pay the Contractor in accordance with the Contract. The Employer shall grant the Contractor right of access to, and / or possession of, the Site progressively for the completion of Works. Such right and possession may not be exclusive to the Contractor. The Contractor will draw/modify the schedule for completion of Works according to progressive possession/right of such sites. For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account. Site access schedule will be consistent with the resettlement plan for the section as applicable. The Tender Program or Programs shall be developed as a critical path network using suitable software. The network must be fully resourced and show the co-ordination with System wide Contracts. The Works Program shall show achievement of all Key Dates and Works Area Access Dates. (1) "Access Dates" are dates that are to be achieved by other than the Contractor and which are considered to be essential to the successful completion of the Contract to the original planned schedule. Lists of the activities completion of which are considered to give rise to an Access Date are included in the PS.	1.Please clarify when the Contractor will get the possession or unhindered access to Site. Since nothing is explicitly mentioned in this Clause & table of key dates. Also as per the Volume 3 Employer's General Specifications, we are required to give Access Dates in our Work Program which actually should be given by Client. 2. We understand that the "Access Date" means the date on which the relevant site/work front is handed over to the Contractor with clear and ready access for execution of works. However, Access Dates are not mentioned in the document which will be required to plan our works program.	Access shall be given to contractor as mentioned in tender documents progressively.
511.	Vol 2 GCC Clause No. 4.9	Site Data & Investigation I) The Employer shall have made available to the Contractor with the Tender documents such data in Employer's possession on hydrological and sub-surface conditions. The accuracy or reliability of the data/studies/reports and of any other information supplied at any time by the Employer or Engineer is not warranted including with respect to the viability of his design and execution of Works and the Contractor shall be responsible for validity, and interpretation of all such data. The Contractor shall conduct further investigations considered necessary by him at his own cost and any error, discrepancies if found in Employer's data at any stage will not constitute ground for any claim for extra time, damages and costs.	1. Please provide us the data for hydrological and subsurface soil conditions.	Please follow tender conditions
512.	Vol 7 Pricing Document GCC 11.4.1	Milestones Achievement Periods The Milestones Activities under each Bill shall identify verifiable steps towards the completion of the work within that Bill. The Tenderer shall indicate the periods (in weeks from the Commencement Date of the Works) within which he shall achieve each Milestone Activity. Milestone Payment Schedule(MPS) a.The MPS completed by the Contractor shall set out the maximum cumulative amount for all Bills put together in relation to each month for which payment may be sought in accordance with Sub-Clause 11.4 of the GCC. This information should also be presented in a tabular form. Monthly Cash Flows for the Contract will form part of the Pricing Document. b. The MPS covers the period, which will commence on the first day of the calendar month next after the month containing the Commencement Date of the Works as per the Contract. The first application for interim payment may be made not earlier than during the month following the calendar month next after the month containing the Commencement Date of the Works, such first application relating to the first month (i.e., month 1) of the MPS. c. The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/Installation and Testing and Commissioning shall not be less than 15% and 10% respectively, of the price quoted in the Price of Supply. If any Milestone is not achieved by the end of the month in which it is scheduled to be achieved, the Engineer shall suspend the payment relating to the Cost Centre in which the Milestone is included. Payments suspended under this Clause shall be resumed by being included in the next application for interim payment made after the Milestone is achieved.	This tender is appears to be based on milestone payment schedule wherein the milestone schedule is to be defined by the Contractor. We request Client to schedule the payment on prorata basis instead of milestone payment so that Contractors cashflow is not affected.	Tender conditions shall prevail
513.	Vol 4 ERTS Clause No. 1.4.4.4 1.4.5.5	East – West Corridor interlinked with North – South: - Only one RSS/AMS shall be constructed at Vasantkunj Depot, and special arrangement shall be made at Charbagh Interchange Station of North – South Corridor to extend feed to East – West Corridor in case of emergency. The 33kV power feeding scheme is developed in such a way that it provides flexibility of operation in normal and outage/emergency situations. This is made possible with three RSSs (2 existing RSS (NS Corridor) + One RSS/AMS at Vasantkunj (East West Corridor)) and 33kV cable interconnections between the North South Corridor and East West Corridor .	We understand that the 33 kV cable is proposed to be laid between the existing Charbagh Elevated Station and the proposed Charbagh Underground Station. We kindly request you to elaborate on the proposed cable routing and method of installation. We would like to understand whether the cable is envisaged to be laid on a dedicated supporting structure or through a walkway bridge. We request you to kindly provide the relevant details for our better understanding and accurate assessment. We are unable to estimate the cable length, trench quantity, and pipe quantity requirements.	Bidder to conduct site visit & interface with designated contractor
514.	Vol 4 ERTS Clause No. Chapter 5 5.4.1	Suitable space for storage of material procured for Lucknow Metro shall be provided by UPMRCL in Lucknow.	Please specify the location and the area which shall be provided for storage by UPMRCL	The details will be shared after onboarding of the contractor.
515.	BOQ_322536	Spares - Column E,F, I	We understand that the total amount (multiplied with the quantity) is to be put in the sheet instead of unit rate of the spares items.	Bidder understanding is correct
516.	Vol 7 Pricing Document Clause No. 4 c.	The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/Installation and Testing and Commissioning shall not be less than 15% and 10% respectively, of the price quoted in the Price of Supply.	No separate line item for Testing commissioning given to quote as per apportionment in the BOQ_322536. We understand that Erection Testing & Commissioning to be quoted not less than 25%	Bidder understanding is correct. Please refer addendum - 4

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
517.	Vol 7 Pricing Document Clause No. 8 b.	Price Variation - Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis: (i) Addition/Deletion of Stations (ii) Increase/ Decrease in the length of the corridors (iii) Change in quantity of Inverters, Inverters Transformer along with associated Switchgears (iv) Change in the location of RSS/AMS However, any change on account of meeting the minimum requirements given in General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Employer's Requirements (General Specifications and Technical Specifications) and Tender Drawings and latest applicable standards shall not be treated as variation in the quoted fixed Lump Sum Price quoted.	Kindly, confirm the location of RSS/ AMS and Depot TSS. Change in location of these substation will have cost implication due to the distance between the RSS/AMS and the station ASS. Further to this, kindly confirm that RSS/AMS and Depot TSS is in the same location or boundary. If not, please share the location of Depot TSS.	Please refere addendum-4
518.	Vol 2 GCC Clause No. 15.2	Insurance for Works and Contractor's Equipment - for the Works having multiple Sections / Parts in one Contract, such insurance shall be in such a manner that the Employer and the Contractor are covered from the commencement date until the date of issue of the Taking over Certificate for respective Part of Works.	We request you to allow reduction of the Insurance Coverage once the Taking over certificate is issued for a particular section.	Please follow tender conditions
519.	Vol 5 - Tender Drawings		In Overall SLD, PT are shown only at bus. Please clarify whether Line PT are required or not?	Refer Addendum 2. PT to consider in bus as well as for line
520.	Vol 5 - Tender Drawings		Both traction transformer are shown at one bus. In case of a cable fault, mutiple DC power will get interrupted. Please check if both transformer need to be shown in different bus	Refer Addendum 2.
521.	Vol 5 - Tender Drawings		Whether differential protection need to be implemented at Charbagh for the feed coming from Charbagh existing ASS. If yes, please specify the relay used in Charbag existing ASS for cable differential protection.	It will be shared during detailed design stage.
522.	Vol 5 - Tender Drawings		Both UG, all TSS /ASS equipment will be in single room or will be split in two room. Please share the layout of TSS/ASS and their location on the stations	Please refer Addendum 2
523.	Vol 5 - Tender Drawings		33kV GIS will be top cable entry or bottom cable entry?	Bidder shall have decide based on site condition at their own cost.
524.	Vol 5 - Tender Drawings		Please explain the relevance of drawing number 71554?	Please refer Addendum 2
525.	Vol 5 - Tender Drawings		In RSS typical SLD , 1Cx 400 sqmm AL cable is shown as incommer wherein in TS , 2 runs of 3C cable is mentioned. Please clarify which need to be considered	Please refer Addendum 2
526.	Vol 5 - Tender Drawings		In RSS typical SLD, 1cx400 sqmm AL cable is shown for outgoing to Depot , whereas in SLD it show 1cx300 sqmm AL. Which one to be consider. Also in overall SLD 4 outgoing breaker is shown whereas in Typical RSS SLD only 2 nos is consider. Please clarify the discrepancy.	Please refer Addendum 2
527.	Vol 5 - Tender Drawings		Depot Typical SLD i. Cable sizing mismatch with SLD ; which to consider ii. 87T is mentioned; please provide the relay details and transformer details at upstream iii. Transformer cable sizing to be confirmed iv. Vasantkunj Station TSS feed coming from RSS or Depot TSS. Discrepancies between overall SLD and Depot SLD. Please clarify	Please refer Addendum 2 & 4
528.	Vol 5 - Tender Drawings		Drawing 72012 - all 4 ckt off 33kV cable running on single side of viaduct ? Please clarify.	Please refer Addendum 2
529.	Third Rail at Depot		Please provide details the total track length of Depot for which third rail need to be design	6.3 km to be considered
530.	Stinger System		Please provide details of stinger length to be considered . Also please provide details of how many line stinger need to be considered	Please refer Addendum 2
531.	Stinger System		Whether Static stinger is required for WBL or shore source (i.e 415 V)? Which one need to be considered for BOQ and Pricing?	Please refer Addendum 2
532.	33kV Cable		SVL is not considered for 33kV Cable . Please confirm our understanding.	Please follow Tender Conditions
533.	Earthing & Bonding		Cross bonding in Tunnel will be only at cross passage . Please confirm our understanding.	Bidder understanding is Correct
534.	Earthing & Bonding		Track to track bond is not considered. Please confirm our understanding	The contractor shall has to propose during design phase at own cost. No extra payment shall be made
535.	Earthing & Bonding		In Elevated section cross bonding will be applicable only at interval of 600 m . Please confirm our understanding	The contractor shall has to propose during design phase at own cost. No extra payment shall be made
536.	Platform Indication Lamp		Whether Platform indication lamp need to be considered for TRED/MSCD? If yes now many per platform is required.	The contractor shall has to propose during design phase at own cost. No extra payment shall be made
537.	ETS .		No ETS is considered in ASS room and RSS room. Please confirm our understanding	Bidder understanding is Correct
538.	ETS .		Depot ETS to be considered at only statigical location like SBL, Washing line and Test track.Please confirm our understanding	Bidder to follow Metro's standard practice.
539.	ETS .		We understand that the ETS shall be supplied from the UPS. Please share the location of UPS. Further to this, kindly share the locations of ETS in UG Section.	UPS location will be in same floor as TSS.Bidder can further inteface ETS location to be considered as per NFPA guidlines..
540.	Location Clause No.		Please inform the location of TSS/ASS at UG (Concourse / Platform) and share the layout of the ASS/ TSS.	Please refer addendum 2

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
541.	Inverter Clause No.		Please inform the location of Inverter and no. of inverters to be installed.	Please refer tender condition. The contractor shall have to propose Location and take approval of the employer/engineer during detailed design stage
542.	Power Quality Analyser Clause No.		Power quality analyser is normally required at the Incoming breaker to distribution network . PQA at all I/C and O/G breaker will increase the cost of the breaker. Please confirm if PQA is required for all I/C and O/G.	Please refer Addendum 2
543.	DC Cable Clause No.		DC cable path at station between track - Please inform whether DC cable need to be routed in covered cable tray or on cable bracket at station track side.	Please follow tender conditions
544.	17.9.3.2.2 of TS Clause No.		Pier earthing / hand rail earthing to be done with 120 sqmm AL cable instead of 70 sqmm Copper cable - Please confirm	Please follow tender conditions
545.	Cable Bracket Clause No.		Cable bracket for 33kV Cable at tunnel area need to be provided by Other Designated contractor - Please confirm our understanding	All Cable bracket insider tunnel to be provided by E&M
546.	RSS Earthmat Clause No.		Earthing beneath RSS building to be considered as MS or GI	Please refer Addendum 2
547.	Tender Drawings Clause No. General Notes		Please confirm whether all drawings marked 'UNDER PROCESS' or 'DATA NOT AVAILABLE' shall be finalized before LOA.	Please refer Addendum 2 & 4
548.	General Clause No. TS Chapter 1		Please clarify hierarchy in case of conflict between TS, BOQ and Tender Drawings.	Please refer GCC clause 1.5
549.	Power Supply Clause No. TS Clause 2.4.2 A2		Please provide finalized traction load flow and simulation study for design year loading.	It will be provided to successful bidder during detailed design stage
550.	Power Supply Clause No. TS Clause 2.5.3/2.5.5		Please confirm N-1 redundancy philosophy for RSS/TSS/ASS under worst case operation.	Please follow tender conditions
551.	33kV Cable Clause No. TS Clause 2.5.7		Please provide sheath induced voltage calculation philosophy and acceptable limits.	Successful bidder to follow the general Practice
552.	Tender Drawings Clause No. Cable Layout Drawings		Please confirm whether thermal backfill is mandatory throughout cable route.	It will be done if required at own cost.
553.	Tender Drawings Clause No. Cable Layout Drawings		Please provide approved utility crossing details and trenchless HDD requirements.	Please refer Addendum 4
554.	Tender Drawings Clause No. PWR-71553, 71554		Cable size shown as 1C x 630 sq.mm Al in Cable section drawings and 1C x 400 sq.mm in SLD. Kindly confirm final cable sizing philosophy.	Please refer Addendum 2 & 4 in conjunction with ERTS (cables)
555.	Tender Drawings Clause No. PWR-71569, 71571		Cable size shown for 33kV AMS vasatnt kunj feeder-1 and 2 as 1R#1Cx400 Sq.mm per phase XLPE Al cable mentioned in RSS SLD, However in 33kV AMS SLD, The cable size shown as 2R#1Cx300 Sq.mm per phase XLPE Al cable. Please clarify the size of cables.	Please refer Addendum 2 (Tender Drawing)
556.	Tender Drawings Clause No. PWR-71943, 71556		Please clarify whether joint bays shall be RCC precast or cast in situ.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
557.	Tender Drawings Clause No. PWR-71559		Please confirm whether sheath voltage limiters (SVL) are mandatory at all link boxes.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
558.	RSS/ASS/TSS Clause No. TS Clause 2.5.10		Please provide detailed relay coordination and protection philosophy.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
559.	Third Rail Clause No. TS Clause 2.5.6		Please confirm conductor rail material and stainless steel cap thickness.	Please refer Chapter 16 Vol 4 (ERTS)
560.	Third Rail Clause No. TS Clause 2.5.6		Please confirm minimum third rail current rating and short circuit capacity.	Please refer Chapter 16 Vol 4 (ERTS)
561.	Third Rail Clause No. TS Clause 2.5.6		Please provide finalized third rail sectioning and remote isolator philosophy.	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
562.	Third Rail Clause No. TS Clause 2.5.6/2.5.8		Please clarify stray current leakage limits and rail-to-earth insulation criteria.	Please follow tender conditions Chapter 17 of Vol 4 (ERTS) and relevant IEC/EN standards
563.	SCADA Clause No. TS Clause 2.5.9		Please provide finalized SCADA architecture drawings and OCC/BCC interface details.	Refer Addendum-2 & 4 (Tender drawings)
564.	SCADA Clause No. TS Clause 1.4.10.5		Please clarify scope of telecom backbone and FO communication interfaces.	Please refer Interface chapter for Telecom Interface.
565.	Earthing & Bonding Clause No. TS Clause 2.5.13		Please provide target earth resistance values for RSS/ASS/TSS.	Please refer Clause no. 1.4.9.2.6 of Vol4 ERTS

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S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
566.	Earthing & Bonding Clause No. TS Clause 2.5.13		Please provide EMC compliance criteria and mandatory test requirements.	Please refer Chapter 17 Vol 4 (ERTS)
567.	Scope Clause No.		Please elaborate on the modifications to be done in Charbagh Elevated Substation. Also, kindly share the details of the existing panels.	The Bidder is requested to visit Charbagh Elevated Station. The existing panel details will be shared with successful bidder.
568.	Soil Test Report Clause No.		Please share the soil test report where the RSS/AMS is to be constructed.	Please follow tender conditions
569.	Site Co-ordinates Clause No.		Please share the site co-ordinates of RSS/AMS and Depot TSS. Inside the depot, the RSS location has been finalized, however, the ASS-cum-TSS location has not yet been finalized. As a result, we are unable to estimate the cable length, trench quantity, and pipe quantity requirements	Please refer Addendum 2 & 4 (Tender Drawing)
570.	Cable Route Clause No.		Kindly, share the cable route from UPPTCL Jehta & Hardoi Substation to the proposed RSS.	It is not in Scope of Traction Contractor.
571.	Tender Drawings Clause No. Pg 6 of 87	SECTION OF 33kV BURIED CABLE TRENCH FROM UPPTCL GSS TO UPMRC RSS	The depth for laying of 33kV Cable is given as 1.8 mtrs and width of 1.5 mtrs. We understand that this dept is normally considered for EHV Cables. Kindly, confirm the 33kV Cable laying requirement.	Please refer Addendum 2 & 4
572.	Vol 4 ERTS Clause No. Chapter 13 13.1.2.7	The 33kV distribution cables shall be laid in; a) At Viaduct/Elevated Section: Cable shall be laid on metallic bracket provided by LKE (02)-01 contractor b) Inside the elevated/U/G ASS/ASS+TSS: All cables within the scope of LKE (02)-01 contractor shall be laid on suitable cable tray provided & arrangement (supply & erection) done by LKE (02)-01 contractor. For finalization of route of cable tray inside ASS contractor will interface with E&M contractor. c) At U/G tunnel Area: Cable shall be laid on metallic bracket provided by E&M contractor	Kindly confirm the scope of supply and installation of cable trays for the Underground ASS/TSS. Please clarify whether the same falls under the scope of this Contract or shall be provided by E&M Contractor.	Please refer Chapter 3 of Vol 4 ERTS (Interface requirement)
573.	Vol 4 ERTS Clause No. 14.2.13.2 page 301 of 651	33kV GIS - Linear fire detection tube based fire protection system	We don't envisage any fire detection tube inside GIS.	Bidder understanding is correct
574.	Vol 4 ERTS Clause No. 14.2.17.4.2 page 306 of 651	33kV GIS All live conductors shall be inside SF6 gas insulating medium /Hybrid model of GIS	As per clause 51(2) of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, the 33/11 kV, 33/22 kV and 22/11 kV Sub-stations and Switching Stations shall be either air insulated or gas insulated or hybrid. In Hybrid GIS during installation of Busbar Abrasion can be produced by canting of the busbar units when pushing them onto the bushings which can lead to flashover and damage the switchgear.The technology of Hybrid Model is different from Full GIS therefore, we request modification of the clause to Gas Insulated Medium only.	Bidder to consider full GIS. Please refer addendum-4
575.	Vol 4 ERTS Clause No.	33kV GIS - Closed door operation- widely accepted industry safety feature	We recommend Manual operations of the different switches like breaker, disconnecter, earthing switch of the switchgear should be possible without opening the front door.This important safety aspect is missing from the specification hence we request your consideration of the same and make part of the specification .	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
576.	Vol 4 ERTS Clause No.	33kV GIS - LinePT Isolation switch	Please confirm if Line PT isolation switch is required for the purpose of cable testing without the need to handle the PTs and thereby minimize the risk to operator safety	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
577.	Vol 4 ERTS Clause No. 14.2.4 Ratings: Table 14.3 & 14.4	33kV AIS - Busbar Rating 1600A/1250A	The ASS/TSS Panels & RSS/AMS Panels Busbar ratings are mentioned differently, as the actual current rating at RSS will remain within 1250A, we request you to make all the busbar Ratings as 1250A.	For RSS/AMS please refer Chapter 12 of Vol 4 ERTS and Addendum 2 & 4(Tender Drawings)
578.	Vol 4 ERTS Clause No. 14.2.5.2.7	33kV AIS - IP 5X/ IP3X	The degree of Protection is mentioned as IP5X at ASS/TSS & IP 3X at RSS/AMS, we request you to make the same common and make it IP4X. Combining the Specs will also help in interchangeability of components	Ples refer addendum-4
579.	Vol 4 ERTS Clause No.	33kV AIS - All necessary precautions shall be implemented in order to prevent bus bar arcing due to moisture retention.	Does this clause signify that Temperature Sensors to be Provided on Busbars to monitor the temperature via SCADA as well. Kindly clarify	It will be decided by the successful bidder with the approval from engineer during detailed design stage and to be implemented (if required) at their own cost.
580.	Vol 4 ERTS Clause No. 10.7.3	Training Requirements - Man-weeks of Employer's Instructor for Offshore training	We understand that the training shall be arranged by the contractor. However, the lodging and boarding of the Employer's personnel shall be in Employer's scope.	OK, Agreed
581.	Vol 4 ERTS Clause No. 10.7.3	Training - Other Systems (to be decided by the Engineer)	Please clarify the systems on which Employer's personnel would get trained on to consider the expenses accordingly.	To be shared during construction stage.
582.	Vol 4 ERTS Clause No. 5.2.2	The site offices shall be of suitable size of useable office area to be located as decided by the Engineer.	Request you to specify the area of the office required	Please follow tender conditions
583.	Vol 4 ERTS Chapter 15 Clause No. 15.3.12.4.6	All the DC relays shall be communicated with the Ethernet switch installed in NRP panel in Star topology configuration with redundant path through PRP (Parallel Redundancy Protocol) over IEC 61850 protocol.	Please clarify if we have to consider PRP in all the Control and Protection Relays for all equipment, viz. HSCB cubicles, OVPDs ?	Please follow tender condition
584.	Vol 4 ERTS Chapter 15 Clause No. 15.6.6.1	The protection relays for the protection of return circuit shall be normally mounted on the panel. Protection relay shall be communicated with the Ethernet switch installed in NRP panel in Star topology configuration with redundant path through PRP(Parallel Redundancy Protocol) over IEC 61850 protocol.	Please clarify if we have to consider PRP in all the Control and Protection Relay	Please follow tender condition
585.	Vol 4 ERTS Chapter 16 Clause No. 16.2.4.9.3	Permanent self-adhesive labels shall be affixed to the top surface of the cover, at intervals not exceeding 5 m, displaying an electric flash symbol and "Danger" sign. The label shall be suitable for outdoor use in the Lucknow environment and legible for at least five years after installation.	The labels may fade due to the harsh environment (solar radiation, pollution, UV, ..) but will be legible for minimum 2-3 years from delivery time, PROVIDED, the deliveries are made just before their installation as long storage shall also deteriorate the adhesive capacity of labels.	Successful bidder may propose alternate better solution (if they have) during detailed design stage with the approval from engineer and to be implemented (if required) at their own cost.
586.	Vol 4 ERTS Chapter 16 Clause No. 16.3.7.3	For conductor rail ramps, only mechanical tests are required. The routine test shall include visual examination and dimensional checks. The Contractor shall provide respective test procedures.	Mechanical test performed under Conductor Rail section.	Tender condition shall prevail

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
587.	Vol 4 ERTS Chapter 16 Clause No. 16.3.8.1.1	The Contractor shall demonstrate by laboratory testing of his proposed design that: a) Adequate fatigue endurance will exist in the support arm and all components; and b) Sufficient resilience in the fastening between the conductor rail and the support claw will be sufficient to avoid accelerated component wear.	mechanical loading test to be performed as detailed in clause 16.3.8.3.8.	Tender condition shall prevail
588.	Vol 4 ERTS Chapter 16 Clause No. 16.3.8.3.3	Dielectric Strength: Ten insulators shall each be tested in accordance with ASTM D 149 Method A Short Time Test. A 60 Hz AC voltage shall be applied for 1 minute between top and bottom in air at ambient temperature and humidity, increasing at approximately 1000 volts per second up to 15 kV rms. There shall be no flashovers and the insulators shall not break down during the time the 10000 volts are applied.	15kV to be updated to 10kV rms as per clause 16.2.4.8.25	Tender Conditions shall be followed
589.	Vol 4 ERTS Chapter 16 Clause No. 16.3.8.4.1	Each insulator shall be inspected for: a) Uniform surface with no visible cracks, hollows, inclusions or surface defects, the insulators showing any of these defects shall be rejected. b) Important dimensions of the insulator c) Molding protrusions on edges of surface of the molding shall not exceed 2mm above the general surface level. d) Electrical resistance of each insulator shall be measured at room temperature and under dry conditions, and it shall be not less than 100 mega ohms. e) From each batch of 1000 insulators, 3 shall be cut along the shortest internal path and the cross-section studied. There shall be no voids in the cross-section greater than 2 mm diameter and no significant accumulation of such voids, which might lead to internal breakdown. There shall also be no internal cracks.	all tests on Insulators to be done on random basis and not on each insulator since the mould used is the same for all insulators.	Tender Conditions shall be followed
590.	Vol 4 ERTS Chapter 16 Clause No. 16.3.9.1.1	A standard length of cover shall be assembled onto the conductor rail to form a normal assembly arrangement and a 1500 N load applied via a pad 30 mm in diameter for UPVC cover and a pad of 100 mm for GRP cover and shall be maintained for five minutes and then removed. For GRP cover test Rubber pads have to be placed in between the Ø100mm pad and the cover top surface. There shall be no permanent deformation or cracking of the cover, and the cover shall remain fastened to the rail with the whole assembly intact.	there shall be no "inside-out or through crack on the GRP covers" after the test.	Tender Conditions shall be followed
591.	Vol 4 ERTS Chapter 16 Clause No. 16.3.9.1.4	The protective cover material shall withstand the following test voltages, which are related to a rated voltage of 750 V dc. a) Power frequency withstand voltage - 5 kV for wet and 10 kV for dry b) Impulse withstand voltage i. Lower impulse level - 13 kV ii. Upper impulse level - 15 kV	test parameters as per clause 16.2.4.9.5 shall be followed.	Bidder understanding is correct.
592.	Vol 4 ERTS Chapter 16 Clause No. 16.4.9 table 16.4	Table 16.4	type tests and routines tests to be as per "development tests" 16.3.2.1. FAT tests to be derived from the routine tests.	Tender Conditions shall be followed
593.	Volume 4: Employer's Requirements- Technical Specifications Chapter 2- scope of work Clause No. 2.5.6	The ramp design shall be rugged, suitable for withstanding arcing due to repeated braking of full load current of trains without undue wear. All possibilities of avoiding break before make shall be explored and implemented.	Arcing issue is a system wide topic combining RS (Power required or regeneration, electrical architecture, etc.), TW (Track alignment) and Power supply parameters and not on conductor rail system. Positioning of ramp along the track shall be defined in accordance with traction simulation to avoid ramp in high current demand area (or breaking area)	Please Refer addendum 2. However, successful bidder to interface with designated contractor and design suitably to meeting the contract clause requirements at their own cost.
594.	Volume 4: Employer's Requirements- Technical Specifications Chapter 2- scope of work Clause No. 2.5.6	Max Nominal Resistance at 150C - 6.5 milliohm per km	table serial number 5- maximum nominal resistance at 15 degrees and short circuit capacity to be as per technical specifications chapter 16.	Chapter 16 of Vol 4 ERTS to be followed.
595.	Platform length Clause No.		Please confirm the length of the Platform for UG and Elevated.	Bidder to consider the platform length as per 3 coach train scheme
596.	BOQ_322536 Clause No. 2.1 A.2	Control Panel	The Relays are mounted on the 33kV Panels itself, separate Control Panel is not required. Kindly, confirm this requirement	Requirement of this control panel feasibility will be decided by the successful bidder during detailed design stage and to be implemented (if required).
597.	BOQ_322536		Please provide the route length of 33kV 3C x 300 sqmm Al cable (2 runs per ckt) from GSS to RSS.	It is not in Scope of contractor
598.	BOQ_322536 Clause No. 2.1 G	Auxiliaries	Fire supression system for AIS at RSS need to be considered under which BOQ item?	Please follow tender conditions (Vol 7 Pricing Document)
599.	BOQ_322536 Clause No. 11.1 A.2	Viaduct Lighting	In Viaduct Lighting, can we consider 5C Al Cable?	Bidder to submit the viaduct lighting scheme and same shall be finalised by the Engineer for finalizing the cable sizing and rating. No extra cost will be paid.
600.	Addendum-2 Annexure 23 Annexure 26	Supply, laying, installation of 33kV Cables from PSA GSSs (Jehta & Hardoi Road to Vasantkunj RSS Power Supply Authority Scope - a. Shall supply, lay and install cables. b. Shall supply & install cable terminations at either end. Item no. A.1.1 - Explanation for Bill no. 4.1 - 33kV cable from UPPCL/DISCOM's Metering Panel In Vasantkunj RSS/AMS to Incomer CBs of Vasantkunj RSS/AMS	As per Annexure 23, it is mentioned that the supply and installation of the cable from GSS to our RSS is in Power Supply Authority. In Annexure 26, 33kV Cable from the metering panel is to RSS is in our scope. Please share the location of the UPPCL/DISCOM's Metering Panel in Vasantkunj RSS.	Please refer Addendum 2
601.	Civil	Contour Survey of Depot Area	Please share the Contour survey. This is required to understand the filling quantity required for achieving the FGL at site.	Bidder may visit depot, as depot coordinates are already shared. Bidder can check the site condition and may proceed accordingly.
602.	Vol-7: Pricing Document / Cl 8 -Price Variation / Page 4 of 83	Price Variation	As per the tender clause, the Price Variation (PV) is understood to be applicable only for supply items related to Conductor Rail, 3.3kV/1.1kV/33kV Cables, and not for the other schedules. This may result in non-compensation of escalation impacts for other major equipment such as transformers, rectifiers, as well as installation-related components including workmen wages, fuel, consumables, and other labour-oriented activities with respect to actual market price escalation. In our experience, service and installation scopes, which are predominantly labour-oriented, are significantly affected due to fluctuations in market indices. For instance, minimum wages across various states have increased substantially over the past few years. In the absence of a suitable compensation mechanism for such escalation, bidders may be compelled to factor additional contingencies into their pricing, which could lead to speculative loading in bid prices. In view of the above, we kindly request the Employer to consider extending the applicability of the Price Variation Clause to all schedules, with suitable weightages aligned to the nature of supply and installation works.	Please refer Addendum 4
603.	Pricing Document - Point 8 Price Variation	Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause. a. Price Variation in Conductor Rail: / b. Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis: / c. Price variation in 3.3 KV & 33kV cables / d. Price variation in 1.1 KV cables	Considering Long gestation period of project alongwith current volatile condition in the market. Keeping price firm for commodity driven items like Dry Type Transformers, AC Switchgears, DC Switchgears, 3rd Rail items except 3rd rail, Labour, Battery, Battery Chargers etc is really difficult to commit for us and for our vendors also. Hence, we propose below items along with market accepted PV formula to consider : 1) 33 kV Dry type transformer as per IEEMA (Cast resin formula without oil). 2) 33 kV AC Switchgears as per IEEMA 3) 3rd Rail componets based on LME Aluminium / IEEMA Steel 4) Labour as per WPI Indices 5) Battery / Battery Chargers as per IEEMA. 6) DC Switchgears as per IEEMA or vendor suggested formula.	Please refer Addendum 4
604.	Pricing Document - Point 8 Price Variation	Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause. a. Price Variation in Conductor Rail: / b. Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis: / c. Price variation in 3.3 KV & 33kV cables / d. Price variation in 1.1 KV cables	Kindly allow mass based PV formula for 3rd Rail as it is composed both of Aluminium and Steel. Further for balance items of 3rd rail mass based formula to be used for Aluminium.	Please refer Addendum 4
605.	/ General /	General	Considering the current geopolitical conditions and Volatility, Price uncertainties, and the significant risk of price escalation, we request that a Price Variation (PV) clause be included for the following items: Dry Type Transformers 33 kV Panels DC Switchgears Third Rail Accessories LT Cables Other major electrical items, as applicable The inclusion of the PV clause is requested to mitigate the impact of fluctuations in raw material and equipment prices during the project execution period.	Please refer Addendum 4
606.	/ General /	General	We request that cost compensation be considered in the event of delay in site access is beyond the actual Project Completion Date.	Please refer Addendum 4

Reply to Pre-Bid Queries

S. No.	Tender Clause No.	Description of Tender Clause	Tenderer's Query	UPMRCL Reply
607.	Vol 7, Pricing document Clause No. 8	Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause.	Considering the ongoing geopolitical uncertainties, war situations, and volatile market conditions affecting raw material, manufacturing, logistics, and supply chain costs, a completely fixed-price contract is not favourable for long-duration projects. We therefore request the Employer to consider provision of price variation for all major components/items of the project to ensure equitable risk allocation between the parties. We envisage longer time duration of this project as the civil works is yet to start. Therefore, Labour price escalation shall also be provided.	Please refer Addendum 4
608.	Vol 7, Pricing document Clause No. 8	Price Variation - Price Variation is applicable only on Conductor Rail, 3.3kV & 33kV Cables and 1.1kV Cables	Considering the present uncertain global conditions, ongoing geopolitical conflicts, and volatile market conditions impacting prices of major commodities, materials, logistics, and equipment, we request that the Price Variation provision be made applicable to the overall Contract Price instead of being restricted to specific items only.	Please refer Addendum 4
609.	Vol 7, Pricing Document Clause No. 8.a.	#UNKNOWN!	Price revision formula- we do not agree to the below formula and the price variations for all aluminium items shall follow the mass based formula. Request you to please consider the same.	Please refer Addendum 4

Addendum 4

Summary Sheet of Addendum-04

Summary Sheet of Addendum-04									
LKE (02)-01: Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main Sub Stations Including 750 Volts DC 3rd Rail Traction System, 33kV Cable Network, ASS, TSS & SCADA System for East West Corridor (Phase 1 B) of Lucknow Metro Rail Project at Lucknow, Uttar Pradesh, India									
Sr.	Volume	Position	Clause	Existing Para/Sub-Para/Clause	Amendments				Remarks
					Add	Delete	Modify		
1	Volume 7		Clause 8	c.Price variation in 3.3 KV & 33kV cables It shall be governed by the latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for the supply of 3.3 kV DC positive cable & Bill 4.1 Supply of 33kV cables. d. Price variation in 1.1 KV cables It shall be governed by the latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for Supply of 1.1 KV DC Negative cable.			✓	c. Price variation in 3.3 KV & 33kV cables It shall be governed by <u>the IEEMA formula is enclosed as Annexure-B or</u> latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for the supply of 3.3 kV DC positive cable & Bill 4.1 Supply of 33kV cables. d. Price variation in 1.1 KV cables It shall be governed by <u>the IEEMA formula enclosed in Annexure-B or</u> latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for Supply of 1.1 KV DC Negative cable. <u>e. Price adjustment in 33 kV AIS Switch Gears and Control Gears: It shall be governed by the formula as given in the Annexure -A. It shall be applicable only on the supply price of 33 kV AIS Switch Gears and Control Gears.</u> <u>f. Price adjustment in 33 kV GIS Switch Gears and Control Gears: It shall be governed by the formula as given in the Annexure -A. It shall be applicable only on the supply price of 33 kV GIS Switch Gears and Control Gears.</u> <u>g. Price adjustment in 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components: It shall be governed by the formula as given in the Annexure -A. It shall be applicable only on the supply price of 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components.</u> <u>h. Price adjustment in Labour Component: It shall be governed by the formula as given in the Annexure - A.</u>	Please Refer Annexure 1
2	Volume 1	ITT	Clause	Clause A3.1, B4.1, C2.2, C2.3, C15.4			✓	Attached Modified Clause no. A3.1, B4.1, C2.2, C2.3, C15.4.	Please Refer Annexure 2
3	Volume 1	NIT	Annexure	Annexure 2(Financial Data) ,Annexure 2A(Undertaking for unaudited balance sheet) & Annexure 4(Available Bid Capapcity)			✓	Attached Updated Annexure 2(Financial Data) ,Annexure 2A(Undertaking for unaudited balance sheet) & Annexure 4(Available Bid Capapcity)	Please Refer Annexure 3
4	Volume 4	Chapter 2	Clause 2.5.5	The Contractor can also propose additional locations for installation of inverters where additional cost can be justified by recovery of energy. This shall be subject to the approval of the Engineer. Additional cost shall be payable to the contractor based on the price agreed in the contract for such additional inverter (i.e. beyond four numbers of inverters).			✓	The Contractor can also propose additional locations for installation of inverters where additional cost can be justified by recovery of energy. This shall be subject to the approval of the Engineer. Additional cost shall be payable to the contractor based on the price agreed in the contract for such additional inverter (i.e. beyond ~~two four~~ numbers of inverters).	Please Refer Annexure 4
5	Volume 7		Bill no. 11.1 , A4	01 No. Inverter set with all necessary accessories			✓	~~04~~ 02 No. Inverter set with all necessary accessories	Please Refer Annexure 5
6	Volume 4	Chapter 13	Table 13.3	10. Short circuit current carrying capacity of conductor- 16 kA for 3 sec			✓	10. Short circuit current carrying capacity of conductor- 16 kA for 3 sec (~~for 300 mm2~~), ~~6.5 kA for 3 sec (for 120 mm2)~~	Please Refer Annexure 6
7	Volume 4	Chapter 16	Table 16.2.4.2.7	Tests shall be carried out on the mechanical and electrical properties to prove the quality of the arrangement. The Contractor/supplier shall submit respective test programs.			✓	Tests shall be carried out on the mechanical ~~and-electrical~~ properties to prove the quality of the arrangement. The Contractor/supplier shall submit respective test programs.	Please Refer Annexure 7
8	Volume 4	Chapter 14	Clause 14.3.3.2	2. Relevant Specification : IS 11171			✓	2. Relevant Specification : ~~IS 11171~~ IS 2026-11	Please Refer Annexure 8
9	Volume 1	FOT(Appendix 1)	Amount of Professional Indemnity Insurance (PII)	of the contract value against BOQ in respect of ‘„design and construct’’ with AOY (any one year) limit of 2 incidents in a year. In the Professional Indemnity insurance Policy the deductible amount shall not be more than 5% of AOA limit. PII Policy shall be obtained within four weeks from „date of commencement’’ and shall be valid for five years after date of issue of ‘Performance Certificate’. Wherever the contractor submits policy for shorter period/annual renewable policy, the same shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The contractor’s submission of such shorter period/renewable policy shall be construed as their irrevocable consent for retention of the performance guarantee.			✓	AOA (any one accident) limit equal to 6% of the contract value against BOQ in respect of ‘„design and construct’’ with AOY (any one year) limit of 2 incidents in a year. In the Professional Indemnity insurance Policy the deductible amount shall not be more than 5% of AOA limit. PII Policy shall be obtained within four weeks from „date of commencement’’ and shall be valid for five years after date of issue of ‘Performance Certificate’. Wherever the contractor submits policy for shorter period/annual renewable policy, the same shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The contractor’s submission of such shorter period/renewable policy shall be construed as their irrevocable consent for retention of the performance guarantee.	Please Refer Annexure 9
10	Volume 4	Chapter 13	Table 13.5	S.no. 12 & 13 Double Circuit 6R#1Cx300sq.mm			✓	Double Circuit ~~03~~ 6R#1Cx300sq.mm	Please Refer Annexure 10
11	Volume 4	Chapter 13	Table 13.3	2x [6 x (1C x 300 mm ²)] Aluminium Conductor FRLS cable for Vasantkunj RSS/AMS			✓	2x [~~3~~ 6 x (1C x 300 mm2)] Aluminium Conductor FRLS cable for Vasantkunj RSS/AMS	Please Refer Annexure 11
12	Volume 7		Clause 4 (Milestone Payment Schedule(MPS))	c. The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/Installation and Testing and Commissioning shall not be less than 15% and 10% respectively, of the price quoted in the Price of Supply.			✓	c.The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/ ~~Installation and~~ Testing and Commissioning(~~ETC~~) shall not be less than ~~25%15% and 10%-~~ <u>respectively</u> , of the price quoted in the Price of Supply.	Please Refer Annexure 12
13	Volume 4	Chapter 14	Clause 14.2.17.4.1	All live conductors shall be inside SF6 gas insulating medium /Hybrid model of GIS.The Contractor shall submit details on quantity, quality and density of SF6 gas to be used in the switchgear in accordance with IEC 60376.			✓	All live conductors shall be inside SF6 gas insulating medium ~~/Hybrid model~~ of ~~full~~ GIS.The Contractor shall submit details on quantity, quality and density of SF6 gas to be used in the switchgear in accordance with IEC 60376.	Please Refer Annexure 13
14	Volume 4	Chapter 14	Table 14.4	13. Protection Degree- IP 3X			✓	13. Protection Degree- IP ~~5X~~ ~~3X~~	Please Refer Annexure 14
15	Volume 5			Additional Tender Drawings			✓	Attached additional and modified Tender Drawings	Please Refer Annexure 15
16	Volume 2		Clause 6.4	Labour Laws: - g) The Contractor shall ensure the registration of all his eligible workers inclusive of Sub-contractor and Petty Contractors with BOCW (Building and Other Construction Workers) Board. Any liabilities on account of BOCW at any stage shall be on part of tenderer and the quoted price shall be inclusive of BOCW charges. The Employer shall make the deduction accordingly and deposit the amount to the concerned authorities.			✓	Labour Laws: - g) The Contractor shall ensure the registration of all his eligible workers inclusive of Sub-contractor and Petty Contractors with BOCW (Building and Other Construction Workers) Board. Any liabilities on account of BOCW at any stage shall be on part of tenderer and the quoted price shall be inclusive of BOCW charges. The Employer shall make the deduction accordingly and deposit the amount to the concerned authorities. ~~Please refer UP Govt Circular attached at Annexure 16.~~	Please Refer Annexure 16
17	Volume 1	NIT	Clause 1.2	Tender Submission start date 03.07.2026 (11:00 Hrs.) Tender Submission end date 14.07.2026 (15:00 Hrs.) Date and Time of Opening of Tender 15.07.2026 (15:00 Hrs.)			✓	Tender Submission start date ~~03.07.2026~~ ~~10.07.2026~~ (11:00 Hrs.) Tender Submission end date ~~14.07.2026~~ ~~21.07.2026~~ (15:00 Hrs.) Date and Time of Opening of Tender ~~15.07.2026~~ ~~22.07.2026~~ (15:00 Hrs.)	Please Refer Annexure 17
18	Volume 4	Chapter 3	Table 3.1.8, Item no. 1(b) (under UG/E&M contractor)	Design, supply, installation of cable trays inside the ASS/TSS by UG (E&M) Contractor.			✓	Design, supply, installation of cable trays inside the ASS/TSS(~~other than Traction~~) by UG (E&M) Contractor	Please Refer Annexure 18

Annexure 1

8. Price Variation

Prices quoted by the tenderer shall be fixed throughout the Tenderer's performance of the contract and not subject to variation on any account except for the items mentioned in this clause.

a. Price Variation in Conductor Rail:

For "Conductor Rail" (Bill No. 7.1), the price adjustment shall be linked to spot rate of aluminium quoted at London Metal Exchange (LME), and shall be as per the following formula:

$$V_c = \frac{0.75 * \text{Accepted Price} * (\text{Current Index} - \text{Base Index}) * f}{\text{Base Index}}$$

Where;

V_c = Increase or decrease in the cost of component during the month under consideration due to change in rates for 'Conductor Rail'

Current Index is the spot rate cost of aluminium as given on the L.M.E. (London Metal Exchange) 28 (twenty-eight) days prior to the date of notification to Engineer / Employer for inspection of material;

Base Index is the cost of aluminium as given by the L.M.E. (London Metal Exchange) 28 (twenty-eight) days prior to the latest date of Tender submission;

$$f = \frac{Z_0}{Z_1}$$

Z_0 is the number of units of the currency of the index which is equivalent to one unit of bid currency as applicable on 28 (twenty-eight) days prior to the latest date of Tender submission; and

Z_1 is the number of units of the currency of the index, which is equivalent to one unit of bid currency as applicable on 28 (twenty-eight) days prior to the date of notification for inspection.

Note: The exchange rates to be employed for such conversion shall be the TT selling rate at the close of business of the State Bank of India on the respective date.

b. Positive or Negative variation in quoted fixed Lumpsum price shall be done by Employer in case of following on pro rata basis:

- (i) Addition/Deletion of Stations
- (ii) Increase/ Decrease in the length of the corridors
- (iii) Change in quantity of Inverters, Inverters Transformer along with associated Switchgears
- (iv) Change in the location of RSS/AMS

However, any change on account of meeting the minimum requirements given in General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Employer's Requirements (General Specifications and Technical Specifications) and Tender Drawings and latest applicable standards shall not be treated as variation in the quoted fixed Lump Sum Price quoted.

c. Price variation in 3.3 KV & 33kV cables

It shall be governed by the [IEEMA formula is enclosed as Annexure-B](#) or latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for the supply of 3.3 kV DC positive cable & Bill 4.1 Supply of 33kV cables.

Annexure 1

- d. Price variation in 1.1 KV cables
It shall be governed by the IEEMA formula enclosed in Annexure-B or latest IEEMA formula at the time of tender submission. It shall be applicable on Bill No 6.1 for Supply of 1.1 KV DC Negative cable.
- e. Price adjustment in 33 kV AIS Switch Gears and Control Gears: It shall be governed by IEEMA formula as given in the Annexure -A or latest IEEMA formula at the time of tender submission. It shall be applicable only on the supply price of 33 kV AIS Switch Gears and Control Gears.
- f. Price adjustment in 33 kV GIS Switch Gears and Control Gears: It shall be governed by IEEMA formula as given in the Annexure -A or latest IEEMA formula at the time of tender submission. It shall be applicable only on the supply price of 33 kV GIS Switch Gears and Control Gears.
- e.g. Price adjustment in 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components: It shall be governed by IEEMA formula as given in the Annexure -A or latest IEEMA formula at the time of tender submission. It shall be applicable only on the supply price of 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components.
- h. Price adjustment in Labour Component: It shall be governed by the formula as given in the Annexure - A.

9. Installation/Construction and Testing & Commissioning:

- 9.1. Installation/ Construction of all the equipment installed under the contract LKE(02)-01 shall be done as per Specifications given under Chapter 6 of TS.
- 9.2. Testing & Commissioning: Testing and commissioning of all the equipments installed under the contract LKE(02)-01 shall be done as per Specifications given under Chapter 7 of TS.

10. Explanatory Notes to Bill of Quantities ("BoQ")

These explanatory notes to be read in conjunction with Chapter-2 of ERTS (Scope of Work) & other scope of ERTS, Tender Drawings, SCC/GCC and ERGS. Any other items not mentioned in the explanatory note is considered included.

10.1 DELETED

10.2 33 kV RECEIVING SUBSTATION/AUXILIARY MAIN SUBSTATION

- 10.2.1 The Bill for Vasantkunj RSS/AMS is presented in BOQ Bill Nos. 2.1. For detailed specifications, the Chapter 12 of TS and tender drawing shall be referred to.
- 10.2.2 Following notes are explanation of the items under these Bill Nos 2.1 :

Item No.	BOQ Item Description	Explanation (BOQ Bill Nos. 2.1 – 33 kV RSS/AMS)
A	33 kV BAYS	
A.1	33 kV Switchgear Panel	
A.1.1	Supply and erection including testing and commissioning of 33 kV Vacuum switchgear	

ANNEXURE - A

1) Price Variation for 33 kV AIS Switch Gears and Control Gears.

The price variation on 33 kV AIS Switch Gears and Control Gears shall be applicable for supply prices only.

For 33 kV AIS Switch Gears and Control Gears, the latest date of delivery of material for considering price variation shall not be later than 180 (One Hundred Eighty) days before that relevant key date for commission of 33 kV AIS Switch Gears and Control Gears. However, if the price variation calculated as per the actual date of notification of inspection is resulting in a price advantage to the employer; the actual date of notification shall be considered for evaluating the price variation.

Price variation that may accrue during the period from the date of tender submission will not be considered for tender evaluation and for deciding inter-se position of the tenderers.

Price variation shall be applicable for 33 kV AIS Switch Gears and Control Gears manufactured in India.

Note: For PV formulas refer attached IEEMA circular as Annexure B.

2) Price Variation for 33 kV GIS Switch Gears and Control Gears.

The price variation on 33 kV GIS Switch Gears and Control Gears shall be applicable for supply prices only.

For 33 kV GIS Switch Gears and Control Gears, the latest date of delivery of material for considering price variation shall not be later than 180 (One Hundred Eighty) days before that relevant key date for commission of 33 kV GIS Switch Gears and Control Gears. However, if the price variation calculated as per the actual date of notification of inspection is resulting in a price advantage to the employer; the actual date of notification shall be considered for evaluating the price variation.

Price variation that may accrue during the period from the date of tender submission will not be considered for tender evaluation and for deciding inter-se position of the tenderers.

Price variation shall be applicable for 33 kV GIS Switch Gears and Control Gears manufactured in India.

Note: For PV formulas refer attached IEEMA circular as Annexure B.

3) Price Variation for 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components.

The price variation on 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components shall be applicable for supply prices only.

For 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components, the latest date of delivery of material for considering price variation shall not be later than 180 (One Hundred Eighty) days before that relevant key date for commission of 33/0.415 kV Aluminum Wound Distribution Transformers Complete with all Accessories and Components.

Annexure A

However, if the price variation calculated as per the actual date of notification of inspection is resulting in a price advantage to the employer; the actual date of notification shall be considered for evaluating the price variation.

Price variation that may accrue during the period from the date of tender submission will not be considered for tender evaluation and for deciding inter-se position of the tenderers.

Price variation shall be applicable for 33/0.415 kV Aluminum Wound Distribution Transformers manufactured in India.

Note: For PV formulas refer attached IEEMA circular as Annexure B, oil component in the IEEMA formula shall be taken as Zero during calculation of Price Variation as the offered Transformers are of Dry type.

4) Price Variation For Labour Component

Contract price shall be adjusted for increase or decrease in rates and prices for the prices quoted in INR for labour component for "Erection/Installation, testing and commissioning" in accordance with the formula given below

$$VL = 0.75 \times R \times [(Li - Lo) / Lo]$$

Where

VL= Increase or decrease in the cost of work during the month under consideration due to change in rates for local labour

Lo = The average consumer price index for industrial workers for Lucknow area as applicable for the month of submission of the bid as published by Labour Bureau, Ministry of labour, GOI

Li = The average consumer price index for industrial workers for Lucknow area during the 'month under consideration' as published by Labour Bureau, Ministry of labour, GOI

R = Gross value of the work done for Erection/Installation, Testing and Commissioning Component of the work under consideration.

Annexure B

Indian Electrical & Electronics Manufacturer's Association
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Cir. No. 35/DIV/ CAB/05/

24th April 2018

To Members of the Cable Division, Utilities, Railways & Listed purchasing organizations

Sub: Correction in PV formulae of LT XLPE Power Cable and addition of factors for HT XLPE Power Cables

We have recently published revised Price Variation Clause for LT&HT XLPE Power Cables and made it effective from 1st November 2017 vide Cir. No.111/DIV/CAB/05 dated 5th December 2017

While replying to a query of a buyer it is observed that the polymer factor for LT XLPE Power Cables (both aluminium and copper) was incorrectly represented by Table P2.

We have now corrected the anomaly by correcting the PV formulae of LT XLPE Aluminium and Copper Insulated Cables (Sl. No. D & E) by representing Polymer factor by Table L2.

We have also worked out factors for XLPE, Copper and Steel for 3 core HT XLPE Power Cables for 500 and 630 sq.mm.

We now enclose complete PV clause of Cable by including all the PV formulae of different types of power cable (Sl. No. A to I), polymer factor Table L2 and updated XL4, H2 and H5 Table of factors for your perusal & record.

We request to replace PV clause of Cable already circulated vide Cir. 111/DIV/CAB/05 dated 5th December 2017 with the enclosed PV clause in your records for future use.


 Senior Director
 Encl: as above



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Material Price Variation Clause For PVC And XLPE Insulated Cables

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

P Price payable as adjusted in accordance with above appropriate formula (in Rs/Km)

Po Price quoted/confirmed (in Rs/Km)

ALUMINIUM

AIF Variation factor for aluminium

Al Price of Aluminium. This price is as applicable of first working day of the month, one month prior to the date of delivery.

AlO Price of aluminium. This price is as applicable on first working day of the month, one month prior to the date of tendering.

COPPER

CuF Variation factor for copper

Cu Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cuo Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of tendering.

PVC COMPOUND

PVCc price of PVC compound. This price is as applicable on first working day of the month, one month prior to the date of delivery.

PVCco Price of PVC compound. This price is as applicable on first working day of the month, one month prior to the date of tendering.

CCFAI Variation factor for PVC compound/Polymer for aluminum conductor cable.

CCFCu Variation factor for PVC compound/Polymer for copper conductor cable.

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XLPE COMPOUND
Effective from: 1st November 217

Cc price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cco Price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of tendering.

XLFAL Variation factor for XLPE compound for aluminum conductor cable.

XLFCU Variation factor for XLPE compound for Copper conductor cable.

STEEL

FeF Variation factor for steel

FeW Variation factor for round wire steel armouring

Fe Price of Steel Strips/steel wire. This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Feo Price of steel strips/steel wire. This price is as applicable on first working day of the month, one month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA (PVC)/CABLE R(1)/--/-- prevailing as on 1st working day of the month i.e. one month prior to the date of tendering.

The date of delivery is the date on which the cable is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes

- All prices of raw materials are exclusive of GST amount.
- All prices excluding Aluminium & Copper are as on first working day of the month.
- The details of prices are as under:

- Price of Aluminium is LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT.
- Price of PVC Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer.
- Price of XLPE Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer
- Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
- Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable).

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Price variation formulae for 'Power Cables'

A. Aluminum conductor PVC insulated 1.1 kV power cables

$$P = P_o + AIF (AL - ALo) + CCFAI (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour); $FeF = 0$ Table References:

ALP	Aluminium conductor in single core unarmoured & multicore cables
P1	Aluminium conductor aluminium armour in single core armoured cables
P2	PVC compound
P3	Steel armour

B. Copper conductor PVC insulated 1.1 kV power cables

$$P = P_o + CuF (Cu - Cuo) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo) + AIF (Al - Alo)$$

For steel armoured cables; $AIF = 0$ For aluminium armoured cables; $FeF = 0$ For unarmoured cables; $FeF, AIF = 0$ Tables References:

CUP	Copper conductor
P2	PVC compound
P3	Steel armour
P4	Aluminium armour

C. Copper conductor PVC insulated 1.1 kV control cables

$$P = P_o + CuF (Cu - Cuo) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured cables; $FeF = 0$ Tables References:

CUC	Copper conductor
P5	PVC compound
P6	Steel armour

D. Aluminum conductor XLPE insulated 1.1 kV power cables

$$P = P_o + AIF (AL - ALo) + XLFAL(CC-Cco) + CCFAI (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour); $FeF = 0$ Table References:

ALP	Aluminium conductor in single core unarmoured & multicore cables
P1	Aluminium conductor aluminium armour in single core armoured cables
L2	Polymer (CCFAI)
P3	Steel armour
XL1	XLPE Compound (XLFAL)

E. Copper conductor XLPE insulated 1.1 kV power cables

$$P = P_o + CuF (Cu - Cuo) + XLFCU (CC-Cco) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo) + AIF (Al - Alo)$$

For steel armoured cables; $AIF = 0$ For aluminium armoured cables; $FeF = 0$

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For unarmoured cables; FeF, AIF = 0

Tables References:

CUP	Copper conductor
L2	Polymer (CCFCu)
P3	Steel armour
P4	Aluminium armour
XL1	XLPE Compound (XLFCu)

F. Copper conductor XLPE insulated 1.1 kV control cables

$$P = P_o + CuF (Cu - Cu_o) + XLFCU (CC-Cco) + CCFCu (PVCc - PVCco) + FeF (Fe - Fe_o)$$

For unarmoured cables; FeF = 0

Tables References:

CUC	Copper conductor
P5	PVC compound
P6	Steel armour
XL2	XLPE Compound

G. For Aluminium conductor XLPE insulated 3.3 to 33 kV power cables

$$P = P_o + AIF (Al - Al_o) + XLFAL(CC-Cco) + CCFAI (PVCc - PVCco) + FeF (Fe - Fe_o)$$

For unarmoured multicore cables (without steel armour); FeF = 0

Table References:

ALP	Aluminium conductor in single core unarmoured & multicore cables
H1	Aluminium conductor + aluminium armour in single core armoured cables
H2	Polymer
H3/H5	Steel armour (Flat/Round)
XL3/XL4	XLPE Compound (Single core /Multicore)

H. Copper conductor XLPE Insulated 3.3 to 33 kV power cables

$$P = P_o + CuF (Cu - Cu_o) + XLFCU (CC-Cco) + CCFCu (PVCc - PVCco) + FeF (Fe - Fe_o) + AIF (Al - Al_o)$$

For steel armoured cables; AIF = 0 For aluminium armoured cables; FeF = 0

For unarmoured cables; FeF, AIF = 0

Table References:

CUP	Copper conductor
H2	Polymer
H3/H5	Steel armour (Flat/Round)
H4	Aluminium armour
XL3/XL4	XLPE Compound (Single core /Multicore)

I. Copper conductor XLPE insulated 1.0 and 1.5 kV Solar PV DC cables

$$P = P_o + CuF (Cu - Cu_o)$$

Table CUsdc Copper Conductor



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TABLE ALP

VARIATION FACTOR FOR ALUMINIUM (AIF)
POWER CABLES WITH ALUMINIUM CONDUCTOR
(EXCLUDING SINGLE CORE ARMoured CABLES)

Nominal Cross Sectional Area (in Sq. mm.)	1 core	2 core	3 core	3.5 core	4 core
2.5	0.007	0.014	0.021	-	0.028
4	0.011	0.023	0.034	-	0.046
6	0.017	0.034	0.052	-	0.069
10	0.029	0.053	0.087	-	0.116
16	0.046	0.091	0.137	-	0.183
25/16	0.073	0.146	0.219	0.262	0.292
35/16	0.101	0.202	0.302	0.345	0.404
50/25	0.137	0.273	0.410	0.478	0.547
70/35	0.197	0.395	0.593	0.687	0.791
95/50	0.274	0.548	0.821	0.949	1.095
120/70	0.346	0.691	1.035	1.221	1.382
150/70	0.425	0.853	1.279	1.464	1.706
185/95	0.533	1.070	1.605	1.861	2.140
225/120	0.655	1.310	1.965	2.287	2.620
240/120	0.703	1.400	2.099	2.421	2.799
300/150	0.879	1.757	2.635	3.033	3.514
400/185	1.126	2.249	3.374	3.873	4.498
500	1.418	2.838	4.256	-	5.675
630	1.828	3.663	5.494	-	7.326
800	2.340	4.679	7.018	-	9.357
1000	2.951	5.890	8.934	-	11.779

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TABLE CUP

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)
POWER CABLES WITH COPPER CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm.)	1 core	2 core	3 core	3.5 core	4 core
2.5	0.023	0.046	0.069	-	0.092
4	0.036	0.076	0.112	-	0.151
6	0.056	0.112	0.171	-	0.227
10	0.095	0.174	0.286	-	0.382
16	0.151	0.299	0.451	-	0.602
25/16	0.240	0.480	0.720	0.862	0.960
35/16	0.332	0.664	0.993	1.135	1.329
50/25	0.451	0.898	1.348	1.572	1.799
70/35	0.648	1.299	1.950	2.260	2.602
95/50	0.901	1.802	2.700	3.121	3.601
120/70	1.138	2.273	3.407	4.016	4.545
150/70	1.398	2.806	4.207	4.815	5.611
185/95	1.753	3.519	5.279	6.121	7.038
225/120	2.154	4.309	6.463	7.522	8.617
240/120	2.312	4.605	6.904	7.963	9.206
300/150	2.891	5.779	8.667	9.976	11.558
400/185	3.703	7.397	11.097	12.738	14.794
500	4.664	9.334	13.998	-	18.665
630	6.012	12.048	18.070	-	24.095
800	7.696	15.389	23.082	-	30.775
1000	9.706	19.372	29.055	-	38.741

TABLE CUsdc

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)
1.0 & 1.5KV Solar PV DC Cables with Copper Conductor

Cable Size in sq.mm.	Copper content in MT/km
2.5	0.023
4	0.038
6	0.058
10	0.090

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TABLE CUC

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)
CONTROL CABLES WITH COPPER CONDUCTOR

No of Cores	Core size 1.5 sq mm	Core size 2.5 sq mm
2	0.026	0.047
3	0.039	0.070
4	0.052	0.094
5	0.065	0.117
6	0.078	0.141
7	0.091	0.164
8	0.110	0.182
9	0.117	0.205
10	0.130	0.235
12	0.157	0.282
14	0.183	0.329
16	0.209	0.376
18	0.246	0.410
19	0.248	0.446
20	0.260	0.456
24	0.313	0.563
27	0.352	0.634
30	0.391	0.704
37	0.483	0.869
44	0.573	1.033
52	0.678	1.221
61	0.796	1.432

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TABLE P1

VARIATION FACTOR FOR ALUMINIUM (AIF)
ALUMINIUM ARMoured SINGLE CORE PVC INSULATED 1.1 KV CABLES

Nominal cross sectional area (in Sq.mm)	Aluminium factor for Aluminium armoured cable with aluminium conductor
4	0.0685
6	0.0795
10	0.1017
16	0.1303
25	0.1693
35	0.2090
50	0.2597
70	0.3360
95	0.4567
120	0.5443
150	0.6427
185	0.7743
240	0.9737
300	1.2582
400	1.5502
500	1.8958
630	2.3650
800	2.9306
1000	3.7666

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TABLE P2

VARIATION FACTOR FOR PVC COMPOUND (CCFAI/CCFCu)
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

Nominal cross Sectional Area (in Sq. mm)	1 core	2 core		3 core		3.5 core		4 core	
	Unarm	Unarm	arm	Unarm	arm	Unarm	arm	Unarm	arm
2.5	0.079	0.125	0.139	0.141	0.157	-	-	0.161	0.179
4	0.094	0.140	0.156	0.164	0.182	-	-	0.188	0.209
6	0.101	0.154	0.171	0.179	0.199	-	-	0.198	0.220
10	0.114	0.194	0.216	0.214	0.238	-	-	0.249	0.277
16	0.142	0.234	0.246	0.279	0.290	-	-	0.328	0.345
25	0.171	0.288	0.303	0.364	0.383	0.422	0.444	0.443	0.466
35	0.189	0.321	0.338	0.403	0.429	0.489	0.515	0.498	0.524
50	0.211	0.411	0.433	0.508	0.535	0.613	0.645	0.647	0.681
70	0.241	-	-	0.613	0.645	0.707	0.744	-	-
95	0.284	-	-	0.795	0.811	0.908	0.927	-	-
120	0.339	-	-	0.866	0.884	1.024	1.045	-	-
150	0.388	-	-	1.070	1.092	1.289	1.315	-	-
185	0.450	-	-	1.310	1.337	1.499	1.530	-	-
225	0.521	-	-	1.586	1.618	1.840	1.878	-	-
240	0.534	-	-	1.649	1.683	1.990	2.031	-	-
300	0.653	-	-	2.007	2.048	2.361	2.409	-	-
400	0.770	-	-	2.437	2.487	2.616	2.669	-	-
500	0.936	-	-	3.117	3.181	3.687	3.762	-	-
630	1.175	-	-	-	-	-	-	-	-
800	1.433	-	-	-	-	-	-	-	-
1000	1.642	-	-	-	-	-	-	-	-

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TABLE P3

VARIATION FACTOR FOR STEEL (FeF)
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

Nominal Cross sectional Area (in Sq. mm)	2 core	Shape	3 core	Shape	3 ½ core	Shape	4 core	Shape
4	0.305	W	0.335	W	-	-	0.363	W
6	0.348	W	0.363	W	-	-	0.407	W
10	0.392	W	0.407	W	-	-	0.293	F
16	0.235	F	0.293	F	-	-	0.323	F
25	0.293	F	0.352	F	0.382	F	0.382	F
35	0.323	F	0.382	F	0.411	F	0.440	F
50	0.382	F	0.440	F	0.469	F	0.499	F
70	0.411	F	0.499	F	-	F	0.587	F
95	0.499	F	0.587	F	0.616	F	0.645	F
120	0.528	F	0.616	F	0.675	F	0.731	F
150	0.587	F	0.675	F	0.731	F	0.790	F
185	0.645	F	0.761	F	0.820	F	0.879	F
240	0.731	F	0.879	F	0.937	F	0.996	F
300	0.820	F	0.966	F	1.055	F	1.113	F
400	0.937	F	1.083	F	1.172	F	1.231	F
500	1.055	F	1.231	F	1.348	F	1.406	F
630	1.172	F	-	-	-	-	-	-

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TABLE P3 (Additional)

VARIATION FACTOR FOR ROUND WIRE 'W' STEEL (FeF)
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in sq. mm)	2 Core	3 Core	3.5 Core	4 Core
1.5	0.247	0.259		0.288
2.5	0.273	0.289		0.329
4	0.305	0.335		0.363
6	0.348	0.363		0.407
10	0.392	0.407		0.533
16	0.439	0.523	0.014	0.573
25	0.526	0.625	0.664	0.685
35	0.591	0.685	0.729	0.761
50	0.661	0.790	0.864	1.108
70	0.745	1.122	1.200	1.256
95	1.085	1.286	1.376	1.443
120	1.147	1.386	1.479	1.562
150	1.267	1.526	1.684	2.173
185	1.403	2.090	2.315	2.421
240	1.994	2.397	2.641	2.722
300	2.180	2.642	3.670	3.842
400	2.987	3.728	4.126	4.292
500	3.517	4.225	5.958	6.301
630	4.774	6.013	6.737	7.141

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TABLE P4

VARIATION FACTOR FOR ALUMINIUM (AIF)
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	Aluminium Factor for Aluminium armoured cable with copper conductor
4	0.058
6	0.063
10	0.073
16	0.084
25	0.096
35	0.108
50	0.123
70	0.139
95	0.183
120	0.198
150	0.218
185	0.241
240	0.271
300	0.379
400	0.424
500	0.478
630	0.537
800	0.591
1000	0.816

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TABLE P5

VARIATION FACTOR FOR PVC COMPOUND (CCFCu)
PVC INSULAYTED CONTROL CABLES WITH COPPER CONDUCTOR

No of cores	Core size 1.5 sq mm		Core size 2.5 sq mm	
	Unarm	Arm	Unarm	Arm
2	0.118	0.121	0.125	0.139
3	0.121	0.131	0.141	0.157
4	0.137	0.152	0.161	0.179
5	0.157	0.174	0.187	0.206
6	0.179	0.199	0.234	0.260
7	0.179	0.199	0.234	0.260
8	0.193	0.215	0.292	0.325
9	0.216	0.241	0.300	0.335
10	0.236	0.262	0.303	0.337
12	0.249	0.277	0.334	0.371
14	0.311	0.327	0.389	0.409
16	0.344	0.362	0.435	0.458
18	0.352	0.371	0.474	0.500
19	0.375	0.395	0.476	0.501
20	0.391	0.412	0.519	0.546
24	0.457	0.481	0.584	0.615
27	0.491	0.517	0.631	0.664
30	0.529	0.557	0.706	0.743
37	0.615	0.647	0.835	0.879
44	0.739	0.778	1.019	1.026
52	0.845	0.889	1.100	1.158
61	0.952	1.002	1.246	1.312

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TABLE P6

VARIATION FACTOR FOR STEEL (FeF)
PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

No of cores	Core size 1.5 sq mm	Shape of armour	Core size 2.5 sq mm	Shape of armour
2	0.243	W	0.277	W
3	0.257	W	0.289	W
4	0.277	W	0.314	W
5	0.303	W	0.342	W
6	0.329	W	0.379	W
7	0.329	W	0.379	W
8	0.341	W	0.456	W
9	0.383	W	0.275	F
10	0.408	W	0.325	F
12	0.289	F	0.342	F
14	0.306	F	0.360	F
16	0.317	F	0.372	F
18	0.332	F	0.350	F
19	0.343	F	0.397	F
20	0.368	F	0.400	F
24	0.398	F	0.475	F
27	0.414	F	0.478	F
30	0.425	F	0.503	F
37	0.461	F	0.548	F
44	0.507	F	0.601	F
52	0.556	F	0.641	F
61	0.585	F	0.685	F

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017
TABLE P6 (Additional)

Effective from: 1st November 217

VARIATION FACTOR FOR ROUND WIRE 'W' STEEL (FeF)
PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

No. of Cores	Core size 1.5 sq mm	Core size 2.5 sq mm
2	0.243	0.273
3	0.257	0.289
4	0.277	0.314
5	0.303	0.342
6	0.329	0.379
7	0.329	0.379
8	0.341	0.456
9	0.383	0.508
10	0.408	0.535
12	0.510	0.572
14	0.546	0.625
16	0.581	0.660
19	0.608	0.696
24	0.714	0.819
25	0.679	0.798
27	0.732	0.837
28	0.696	0.815
30	0.758	0.881
33	0.747	0.883
37	0.820	1.217
44	0.926	1.355
48	1.122	1.308
50	1.122	1.308
52	1.149	1.361
56	1.202	1.388
61	1.299	1.520

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE L2

VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)

XLPE INSULATED 1.1 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	1 core	2 core		3 core		3.5 core		4 core	
	Unarm	Unarm	Arm	Unarm	Arm	Unarm	Arm	Unarm	Arm
2.5	0.055	0.163	0.175	0.166	0.177	-	-	0.177	0.188
4	0.075	0.201	0.204	0.205	0.213	-	-	0.218	0.213
6	0.085	0.213	0.234	0.205	0.230	-	-	0.242	0.232
10	0.082	0.252	0.280	0.217	0.251	-	-	0.285	0.298
16	0.089	0.278	0.341	0.289	0.246	-	-	0.300	0.279
25	0.101	0.307	0.278	0.276	0.247	0.295	0.264	0.331	0.290
35	0.109	0.330	0.319	0.305	0.270	0.328	0.292	0.368	0.319
50	0.124	0.482	0.685	0.348	0.311	0.372	0.335	0.422	0.394
70	0.146	0.354	0.335	0.469	0.397	0.489	0.420	0.528	0.464
95	0.163	0.436	0.389	0.504	0.441	0.544	0.471	0.591	0.523
120	0.176	0.475	0.421	0.556	0.498	0.599	0.538	0.722	0.656
150	0.217	0.510	0.490	0.690	0.611	0.717	0.633	0.840	0.762
185	0.236	0.631	0.608	0.836	0.738	0.854	0.756	1.007	0.899
240	0.273	0.750	0.726	1.002	0.842	1.079	0.952	1.238	1.119
300	0.303	0.919	0.887	1.161	1.012	1.170	1.031	1.457	1.414
400	0.372	1.093	1.040	1.376	1.283	1.545	1.379	1.778	1.626
500	0.413	1.342	-	1.568	1.400	1.806	1.456	-	-
630	0.469	1.546	-	-	-	-	-	-	-
800	0.569	-	-	-	-	-	-	-	-
1000	0.667	-	-	-	-	-	-	-	-

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE XL1
VARIATION FACTOR FOR XLPE COMPOUND (XLFAL/XLFCU)
XLPE INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

Nominal cross Sectional Area (in Sq. mm)	1 core		2 core		3 core		3.5 core		4 core	
	Unarm	Arm	Unarm	Arm	Unarm	arm	Unarm	Arm	Unarm	arm
2.5	0.007	0.010	0.014	0.014	0.021	0.021			0.028	0.028
4	0.009	0.012	0.018	0.018	0.027	0.027			0.036	0.036
6	0.010	0.015	0.022	0.022	0.033	0.033			0.043	0.043
10	0.013	0.018	0.025	0.025	0.039	0.039			0.053	0.053
16	0.016	0.023	0.034	0.034	0.049	0.049			0.065	0.065
25	0.021	0.030	0.048	0.048	0.070	0.070	0.084	0.084	0.093	0.093
35	0.025	0.035	0.059	0.059	0.084	0.084	0.099	0.099	0.112	0.112
50	0.033	0.044	0.075	0.075	0.108	0.108	0.130	0.130	0.144	0.144
70	0.042	0.054	0.095	0.095	0.137	0.137	0.160	0.160	0.179	0.179
95	0.048	0.062	0.110	0.110	0.160	0.160	0.190	0.190	0.211	0.211
120	0.060	0.076	0.138	0.138	0.200	0.200	0.239	0.239	0.266	0.266
150	0.078	0.095	0.180	0.180	0.259	0.259	0.296	0.296	0.344	0.344
185	0.097	0.116	0.224	0.224	0.324	0.324	0.369	0.369	0.430	0.430
240	0.116	0.137	0.266	0.266	0.388	0.388	0.446	0.446	0.518	0.518
300	0.138	0.164	0.325	0.325	0.467	0.467	0.540	0.540	0.620	0.620
400	0.175	0.214	0.357	0.357	0.536	0.536	0.619	0.619	0.714	0.714
500	0.217	0.260	0.440	0.440	0.660	0.660	0.769	0.769	0.880	0.880
630	0.265	0.318	0.542	0.542	0.814	0.814	0.941	0.941	1.085	1.085
800	0.323	0.389								
1000	0.375	0.444								

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE XL2
VARIATION FACTOR FOR XLPE COMPOUND (XLFCU)
XLPE INSULAYTED CONTROL CABLES WITH COPPER CONDUCTOR

No of cores	Core size 1.5 sq mm		Core size 2.5 sq mm	
	Unarm	Arm	Unarm	Arm
2	0.010	0.010	0.012	0.012
3	0.016	0.016	0.018	0.018
4	0.021	0.021	0.025	0.025
5	0.026	0.026	0.031	0.031
6	0.031	0.031	0.037	0.037
7	0.036	0.036	0.043	0.043
8	0.036	0.036	0.043	0.043
9	0.042	0.042	0.049	0.049
10	0.052	0.052	0.061	0.061
12	0.062	0.062	0.074	0.074
14	0.073	0.073	0.086	0.086
16	0.083	0.083	0.098	0.098
18	0.094	0.094	0.110	0.110
19	0.099	0.099	0.116	0.116
20	0.104	0.104	0.123	0.123
24	0.125	0.125	0.147	0.147
27	0.140	0.140	0.165	0.165
30	0.156	0.156	0.184	0.184
37	0.192	0.192	0.227	0.227
44	0.229	0.229	0.270	0.270
52	0.270	0.270	0.319	0.319
61	0.317	0.317	0.374	0.374

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE XL3

VARIATION FACTOR FOR XLPE(XLFAL/XLFCU)

SINGLE CORE ARMoured /UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH
CU / AL CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm.)	XLPE Factor for Armoured/ Unarmoured Cable with AL /CU Conductor					
	3.3 KV	6.6 KV (E)	11 KV (E)/ 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)
25	0.110	0.131	0.170	0.279		
35	0.122	0.137	0.175	0.284	0.317	0.522
50	0.135	0.151	0.191	0.307	0.341	0.563
70	0.155	0.172	0.215	0.342	0.379	0.615
95	0.174	0.193	0.241	0.377	0.417	0.670
120	0.192	0.212	0.262	0.407	0.449	0.713
150	0.209	0.229	0.283	0.437	0.481	0.757
185	0.228	0.250	0.308	0.471	0.518	0.809
240	0.255	0.279	0.343	0.519	0.569	0.883
300	0.280	0.322	0.372	0.560	0.613	0.943
400	0.326	0.392	0.420	0.625	0.683	1.041
500	0.388	0.461	0.469	0.694	0.757	1.142
630	0.467	0.520	0.529	0.777	0.845	1.265
800	0.567	0.593	0.602	0.874	0.949	1.407
1000	0.656	0.665	0.660	0.955	1.036	1.525

Note : XLPE factors include Semicons for Conductor & Insulation screen

TABLE – XL4

VARIATION FACTOR FOR XLPE (CCF1A/ / CCF1Cu)

3 CORE XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM
25	0.315	0.394	0.511	0.838		
35	0.339	0.427	0.545	0.880	0.982	1.638
50	0.378	0.474	0.600	0.957	1.065	1.751
70	0.435	0.541	0.679	1.067	1.183	1.916
95	0.489	0.604	0.755	1.171	1.295	2.071
120	0.537	0.661	0.822	1.265	1.396	2.210
150	0.585	0.719	0.890	1.359	1.497	2.350
185	0.642	0.784	0.968	1.468	1.614	2.513
240	0.717	0.873	1.074	1.615	1.773	2.732
300	0.781	1.006	1.167	1.744	1.928	2.919
400	0.886	1.227	1.314	1.948	2.130	3.229
500	0.956	1.421	1.445	2.148	2.381	3.538
630	1.129	1.582	1.609	2.382	2.630	3.940

Note : XLPE factors include Semicons for Conductor & Insulation screen

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE H1
VARIATION FACTOR FOR ALUMINIUM (AIF)
 ALUMINIUM ARMoured SINGLE CORE XLPE INSULATED 3.3 TO 33 KV CABLES

Nominal Cross Sectional Area (in Sq. mm.)	Aluminium Factor for Aluminium Armoured Cable with Aluminium Conductor					
	3.3 KV	6.6 KV (E)	11 KV (E)/ 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)
35	0.251	0.284	0.301	0.344	0.358	0.473
50	0.312	0.336	0.352	0.397	0.408	0.672
70	0.385	0.409	0.423	0.469	0.501	0.723
95	0.476	0.500	0.518	0.637	0.656	0.856
120	0.561	0.586	0.601	0.726	0.744	0.949
150	0.653	0.678	0.696	0.823	0.842	1.050
185	0.773	0.797	0.893	0.949	0.965	1.183
240	0.997	1.063	1.083	1.139	1.154	1.387
300	1.209	1.271	1.283	1.333	1.307	1.753
400	1.438	1.556	1.565	1.620	1.636	2.046
500	1.873	1.901	1.910	2.110	2.128	2.484
630	2.337	2.361	2.369	2.580	2.595	2.978
800	3.007	3.071	3.080	3.145	3.163	3.588
1000	3.737	3.741	3.749	3.804	3.822	4.565

TABLE H2
VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)
 3 CORE XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM
35	0.374	0.990	1.142	1.604	1.782	-
50	0.445	1.119	1.260	1.834	2.046	2.864
70	0.547	1.290	1.396	2.011	2.284	3.219
95	0.594	1.440	1.647	2.269	2.428	3.367
120	0.732	1.692	1.877	2.498	2.715	3.646
150	0.812	1.906	2.061	2.767	2.931	3.927
185	0.960	2.086	2.406	3.028	3.180	4.166
240	1.130	2.484	2.744	3.398	3.580	4.589
300	1.219	2.912	3.161	3.840	4.016	5.029
400	1.313	3.530	3.664	4.353	4.666	5.736
500	1.652	3.925	3.971	4.621	4.878	5.913
630	1.949	4.487	4.982	5.225	5.477	6.696

Fillers added in PVC consumption

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 2017

TABLE H3
 VARIATION FACTOR FOR STEEL (FeF)
 XLPE INSULATED 3.3 TO 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area Sq. mm.	3.3 KV	6.6 KV (E)	11 KV (E) / 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)
25	0.551	0.604	0.656	0.814		
35	0.645	0.645	0.731	0.879	0.937	-
50	0.675	0.703	0.761	0.937	0.966	1.181
70	0.761	0.761	0.849	0.996	1.055	1.289
95	0.820	0.849	0.907	1.083	1.113	1.348
120	0.879	0.907	0.966	1.142	1.172	1.406
150	0.966	0.966	1.055	1.201	1.259	1.494
185	1.025	1.055	1.113	1.259	1.318	1.553
240	1.142	1.142	1.231	1.377	1.406	1.641
300	1.231	1.259	1.318	1.465	1.524	1.758
400	1.348	1.406	1.435	1.582	1.641	1.876

Annexure B

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1st November 217

TABLE H4
VARIATION FACTOR FOR ALUMINIUM (AIF)

XLPE INSULATED SINGLE CORE 3.3 TO 33 KV POWER CABLES WITH COPPER CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm.)	Aluminium Factor for Aluminium Armoured Cable with Copper Conductor					
	3.3 KV	6.6 KV (E)	11 KV (E)/ 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)
35	0.153	0.187	0.204	0.247	0.258	0.372
50	0.179	0.203	0.220	0.262	0.275	0.425
70	0.196	0.219	0.233	0.278	0.311	0.444
95	0.213	0.237	0.254	0.373	0.392	0.470
120	0.228	0.253	0.268	0.393	0.410	0.488
150	0.243	0.269	0.287	0.414	0.432	0.504
185	0.261	0.285	0.381	0.437	0.455	0.526
240	0.324	0.389	0.410	0.465	0.480	0.556
300	0.365	0.428	0.440	0.490	0.510	0.737
400	0.432	0.471	0.480	0.536	0.552	0.783
500	0.489	0.517	0.526	0.726	0.744	0.844
630	0.544	0.568	0.572	0.787	0.801	0.902
800	0.706	0.787	0.797	0.862	0.880	0.982
1000	0.824	0.865	0.867	0.923	0.940	1.324

TABLE - H5
VARIATION FACTOR FOR STEEL (FeW)

XLPE INSULATED 3.3KV TO 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area in Sq. mm	3.3/3.3 KV	3.3/6.6 KV	11 KV (E) / 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)
25	1.258	1.457	1.612	2.509	1.503	--
35	1.361	1.569	1.853	2.644	2.797	2.517
50	1.682	1.687	2.321	2.800	2.921	4.569
70	2.033	1.979	2.503	3.219	3.347	4.809
95	2.202	2.507	2.718	4.019	4.200	5.437
120	2.371	2.675	2.882	4.241	4.416	6.713
150	2.870	2.847	3.265	4.447	4.621	6.976
185	3.121	3.309	4.148	4.726	5.289	7.356
240	3.758	4.227	4.442	5.442	6.651	7.718
300	4.099	5.024	5.182	6.894	7.084	8.187
400	5.750	6.572	6.658	7.433	7.657	8.760
500	6.716	6.777	6.861	7.588	7.797	8.830
630	7.492	7.465	7.477	8.209	8.386	9.413



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IEEMA/PVC/DIST_CU_upto 2.5 MVA/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR COPPER WOUND DISTRIBUTION TRANSFORMERS
 COMPLETE WITH ALL ACCESSORIES AND COMPONENTS**

**(For single & three phase of ratings up to and including 2,500 KVA and voltage class up to 33 KV)
 supplied against domestic contracts**

This price variation clause is applicable for 'Copper Wound Distribution Transformers', with rating up to and including 2,500 KVA and voltage class up to 33 KV supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_CU_upto 2.5 MVA/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(7 + 41 \frac{C}{C_0} + 23 \frac{ES}{ES_0} + 10 \frac{IS}{IS_0} + 5 \frac{IM}{IM_0} + \frac{TO}{TO_0} + 8 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

C₀ = Price of CC copper rods (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IS₀ = Price of HR Coil of 3.15 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IM₀ = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

TO₀ = Price of Transformer Oil (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

Annexure B

CIN No. U99999MH1970GAPO14629



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IEEMA/PVC/DIST_CU_upto 2.5 MVA/2021

Effective from: 01 September 2021

W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Copper (C_0), Transformer Oil (TO_0), CRGO Steel Sheets (ES_0), HR Coil (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of tendering.

C = Price of CC copper rods (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IS = Price of HR Coil of 3.15 mm thickness (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

TO = Price of Transformer Oil (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Copper (C), Transformer Oil (TO), CRGO Steel Sheets (ES), HR Coil (IS) and Insulating material (IM) should be as on 1st November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of delivery.



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IEEMA/PVC/DIST_CU_upto 2.5MVA/2021

Effective from: 01 September 2021

The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

- (a) All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.
- (b) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
- (c) The details of prices are as under:
 1. Price of 8 mm CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
 2. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 3. Price of steel is the average retail price of HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT.
 4. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 5. The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
- (d) Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

$$P = \frac{P_o}{92} \left(7 + 41 \frac{C}{C_o} + 23 \frac{ES}{ES_o} + 10 \frac{IS}{IS_o} + 5 \frac{IM}{IM_o} + 6 \frac{W}{W_o} \right)$$

Where description of P, P_o, C, ES, IS, IM, W etc. remains same as mentioned earlier.

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IEEMA/PVC/DIST_AL_upto 2.5 MVA/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR ALUMINIUM WOUND DISTRIBUTION TRANSFORMERS
 COMPLETE WITH ALL ACCESSORIES AND COMPONENTS**

**(For single & three phase of ratings up to and including 2,500 KVA and voltage class up to 33 KV)
 supplied against domestic contracts**

This price variation clause is applicable for 'Aluminium Wound Distribution Transformers', with rating up to and including 2,500 KVA and voltage class up to 33 KV supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_AL_upto 2.5 MVA/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(8 + 22 \frac{AL}{AL_0} + 36 \frac{ES}{ES_0} + 12 \frac{IS}{IS_0} + 5 \frac{IM}{IM_0} + 10 \frac{TO}{TO_0} + 7 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

AL₀ = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IS₀ = Price of HR Coil of 3.15 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IM₀ = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

TO₀ = Price of Transformer Oil (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

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Annexure B

CIN No. U99999MH1970GAPO14629



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Effective from: 01 September 2021

W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Aluminium (AL_0), Transformer Oil (TO_0), CRGO Steel Sheets (ES_0), HR Coil (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of tendering.

AL = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IS = Price of HR Coil of 3.15 mm thickness (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

TO = Price of Transformer Oil (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Aluminium (AL), Transformer Oil (TO), CRGO Steel Sheets (ES), HR Coil (IS) and Insulating material (IM) should be as on 1st November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of delivery.

Annexure B

CIN No. U99999MH1970GAPO14629



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IEEMA/PVC/DIST_AL_upto 2.5 MVA/2021

Effective from: 01 September 2021

The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

- All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.
- Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
- The details of prices are as under:
 - Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT using exchange rate and adding appropriate customs duty.
 - The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 - Price of steel is the average retail price of HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT.
 - The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 - The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
- Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

$$P = \frac{P_o}{90} \left(8 + 22 \frac{AL}{AL_o} + 36 \frac{ES}{ES_o} + 12 \frac{IS}{IS_o} + 5 \frac{IM}{IM_o} + 7 \frac{W}{W_o} \right)$$

Where description of P, P_o, AL, ES, IS, IM, W etc. remains same as mentioned earlier

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IEEMA/PVC/DIST_CU_Above 2.5 MVA/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR COPPER WOUND DISTRIBUTION TRANSFORMERS
 COMPLETE WITH ALL ACCESSORIES AND COMPONENTS
 (of ratings above 2,500 KVA and voltage class up to 33 KV)
 supplied against domestic contracts**

This price variation clause is applicable for 'Copper Wound Distribution Transformers' for single & three phase of rating above 2,500 KVA and voltage class up to 33 KV; supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_CU_Above 2.5 MVA/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(8 + 40 \frac{C}{C_0} + 24 \frac{ES}{ES_0} + 8 \frac{IS}{IS_0} + 4 \frac{IM}{IM_0} + 8 \frac{TO}{TO_0} + 8 \frac{W}{W_0} \right)$$

Wherein,

- P = Price payable as adjusted in accordance with the above formula.
- P₀ = Price quoted/confirmed.
- C₀ = Price of CC copper rods (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- IS₀ = Price of MS Plate of 6 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- IM₀ = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- TO₀ = Price of Transformer Oil (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

Annexure B

CIN No. U99999MH1970GAPO14629



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IEEMA/PVC/DIST_CU_Above 2.5 MVA/2021

Effective from: 01 September 2021

W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Copper (C_0), Transformer Oil (TO_0), CRGO Steel Sheets (ES_0), MS Plate (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/ / **ONE** month prior to the date of tendering.

- C = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** months prior to the date of delivery.
- IS = Price of MS Plate of 6 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- TO = Price of Transformer Oil (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Copper (C), Transformer Oil (TO), MS Plate (IS) and Insulating material (IM) should be as on 1st November 2022, price of CRGO Steel Sheets (ES) as on 1st October 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.



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IEEMA/PVC/DIST_CU_Above 2.5 MVA/2021

Effective from: 01 September 2021

Notes:

- a) All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.
- b) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
- c) The details of prices are as under:
 1. Price of 8 mm CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
 2. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 3. Price of steel is the average retail price of MS Plate 6 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT.
 4. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 5. The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
- d) Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

$$P = \frac{P_o}{92} \left(8 + 40 \frac{C}{C_o} + 24 \frac{ES}{ES_o} \frac{IS}{IS_o} + 8 \frac{IM}{IM_o} + 8 \frac{W}{W_o} \right)$$

Where description of P, P_o, C, ES, IS, IM, W etc. remains same as mentioned earlier.

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IEEMA/PVC/DIST_AL_Above 2.5 MVA/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR ALUMINIUM WOUND DISTRIBUTION TRANSFORMERS
 COMPLETE WITH ALL ACCESSORIES AND COMPONENTS
 (of ratings above 2,500 KVA and voltage class up to 33 KV)
 supplied against domestic contracts**

This price variation clause is applicable for 'Aluminium Wound Distribution Transformers' for single & three phase of rating above 2,500 KVA and voltage class up to 33 KV; supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_AL_Above 2.5 MVA/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(9 + 16 \frac{AL}{AL_0} + 35 \frac{ES}{ES_0} + 14 \frac{IS}{IS_0} + 6 \frac{IM}{IM_0} + 11 \frac{TO}{TO_0} + 9 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

AL₀ = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IS₀ = Price of MS Plate of 6 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IM₀ = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

TO₀ = Price of Transformer Oil (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

Annexure B

CIN No. U99999MH1970GAPO14629



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W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Aluminium (AL_0), Transformer Oil (TO_0), MS Plate (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and CRGO Steel Sheets (ES_0) should be as on October 2021, and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of tendering.

AL = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IS = Price of MS Plate of 6 mm thickness (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

TO = Price of Transformer Oil (refer notes)
This price is as applicable for the month, ONE month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, THREE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Aluminium (AL), Transformer Oil (TO), MS Sheet (IS) and Insulating material (IM) should be as on 1st November 2022 and CRGO Steel Sheets (ES) should be as on 1st October 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

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Notes:

- All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.
- Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
- The details of prices are as under:
 - Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT using exchange rate and adding appropriate customs duty.
 - The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 - Price of steel is the average retail price of MS Plate 6 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT.
 - The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 - The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
- Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

$$P = \frac{P_o}{89} \left(9 + 16 \frac{AL}{AL_o} + 35 \frac{ES}{ES_o} + 14 \frac{IS}{IS_o} + 6 \frac{IM}{IM_o} + 9 \frac{W}{W_o} \right)$$

Where description of P, P_o, AL, ES, IS, IM, W etc. remains same as mentioned earlier.

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IEEMA/PVC/DIST_DT_CU/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR COPPER WOUND DRY TYPE DISTRIBUTION TRANSFORMERS
 COMPLETE WITH ALL ACCESSORIES AND COMPONENTS**

**(Of ratings up to and including 2,500 KVA and voltage class up to 33 KV)
 supplied against domestic contracts**

This price variation clause is applicable for 'Copper Wound Dry Type Distribution Transformers', with rating up to and including 2,500 KVA and voltage class up to 33 KV supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_DT_CU/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(7 + 35 \frac{C}{C_0} + 30 \frac{ES}{ES_0} + 7 \frac{IS}{IS_0} + 8 \frac{IM}{IM_0} + 7 \frac{ER}{ER_0} + 6 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

C₀ = Price of CC copper rods (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IS₀ = Price of HR Coil of 3.15 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

IM₀ = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ER₀ = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.





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W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, THREE months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Copper (C_0), Epoxy Resin (ER_0), CRGO Steel Sheets (ES_0), HR Coil (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of tendering.

- C = Price of CC copper rods (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- ES = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- IS = Price of HR Coil of 3.15 mm thickness (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- IM = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- ER = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, THREE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Copper (C), Epoxy Resin (ER), CRGO Steel Sheets (ES), HR Coil (IS) and Insulating material (IM) should be as on 1st November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ ONE month prior to the date of delivery.



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The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes: (a) All prices of raw materials are exclusive of GST amount and exclusive of any other central, state or local taxes etc..

a) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier

b) The details of prices are as under:

1. Price of 8 mm CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
2. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
3. Price of steel is the average retail price of HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT
4. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
5. The price of Epoxy resin is price quoted by resin manufacturer for their grade CT 5900 or its nearest equivalent.

Director

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Cir. No. 22/DIV/CAB/05

07 June 2023

To Cable Division and Utilities/SEBS, listed of purchasing organisations

Sub: Correction in amendment to Price Variation Clause for MV and EHV Cables wef Apr 2023

IEEMA recently published amended Price Variation Clause for MV and EHV Cables wef Apr 2023 vide Cir. No. 07/DIV/CAB/05 and 06/DIV/CAB/05 dated 08 May 2023. After publishing IEEMA found some corrections to be done in the below factor tables:

For EHV Cables -

Table: 3d (SMIF): Variation factor for Copper in Lead + Cu wire construction (CuFpb)

For MV Cables -

Table: H4 (c) 3.3 KV (E) Unscreened arm

And note added for Table: H5 (a) & Table: H5 (b) as "Fillers added in above factors"

The corrected factor tables are attached and request to all stakeholders to replace these tables with earlier published factor tables.

All other factor tables and guidelines remains unchanged as per Cir No. 07/DIV/CAB/05 and 06/DIV/CAB/05 dated 08 May 2023.

Director

Encl.: corrected factor tables for amended PV clause for MV Cables wef Apr 23.



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TABLE : H4 (c)

VARIATION FACTOR FOR STEEL WIRE ARMOUR (FeW)

THREE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area in Sq. mm	3.3 KV (E) Unscreened arm	3.3 KV (E) screened arm	6.6 KV (E)	11 KV (E) / 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
25	1.258	1.358	1.457	1.612	2.509	1.503	-	-
35	1.361	1.465	1.569	1.853	2.644	2.797	2.517	-
50	1.682	1.685	1.687	2.321	2.800	2.921	4.569	4.603
70	2.033	1.959	1.979	2.503	3.219	3.347	4.809	4.935
95	2.202	2.355	2.507	2.718	4.019	4.200	5.437	6.553
120	2.371	2.523	2.675	2.882	4.241	4.416	6.713	6.820
150	2.870	2.812	2.847	3.265	4.447	4.621	6.976	7.088
185	3.121	3.215	3.309	4.148	4.726	5.289	7.356	7.489
240	3.758	3.993	4.227	4.442	5.442	6.651	7.718	7.890
300	4.099	4.562	5.024	5.182	6.894	7.084	8.187	8.359
400	5.750	6.161	6.572	6.658	7.433	7.657	8.760	8.960
500	6.716	6.747	6.777	6.861	7.588	7.797	8.830	9.629
630	7.492	7.116	7.465	7.477	8.209	8.386	9.413	10.365

TABLE : H5 (a)

VARIATION FACTOR FOR Polymer (CCFAL/CCFCu)

SINGLE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV(E) Unscreened ARM	3.3 KV(E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.123	0.197	0.259	0.278	0.330	0.376	0.468	0.493
50	0.152	0.209	0.272	0.294	0.379	0.394	0.483	0.530
70	0.170	0.227	0.295	0.317	0.404	0.419	0.508	0.583
95	0.184	0.244	0.317	0.338	0.435	0.449	0.554	0.609
120	0.197	0.261	0.337	0.392	0.457	0.472	0.576	0.634
150	0.194	0.303	0.389	0.413	0.477	0.492	0.597	0.656
185	0.224	0.322	0.414	0.445	0.502	0.539	0.674	0.767
240	0.276	0.354	0.456	0.479	0.558	0.573	0.711	0.806
300	0.294	0.377	0.489	0.506	0.587	0.602	0.811	0.915
400	0.333	0.450	0.569	0.578	0.687	0.703	0.866	0.974
500	0.367	0.493	0.675	0.679	0.809	0.826	1.056	1.139
630	0.438	0.611	0.735	0.739	0.873	0.928	1.168	1.290
800	0.529	0.734	0.863	0.866	1.027	1.05	1.189	1.380
1000	0.648	0.880	1.031	1.035	1.138	1.158	1.402	1.619

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor, the above factor will be multiplied by 0.63
 Fillers added in above factors



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TABLE : H5 (a)

VARIATION FACTOR FOR Polymer (CCFAL/CCFCu)

SINGLE CORE UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV(E) Unscreened ARM	3.3 KV(E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.158	0.191	0.224	0.252	0.323	0.342	0.361	0.380
50	0.177	0.209	0.240	0.269	0.342	0.361	0.520	0.539
70	0.198	0.232	0.265	0.296	0.370	0.391	0.551	0.572
95	0.233	0.261	0.288	0.318	0.396	0.450	0.582	0.636
120	0.253	0.282	0.310	0.342	0.454	0.477	0.613	0.636
150	0.269	0.299	0.328	0.361	0.476	0.500	0.638	0.662
185	0.292	0.323	0.354	0.420	0.508	0.532	0.719	0.743
240	0.322	0.371	0.419	0.455	0.547	0.572	0.766	0.791
300	0.355	0.408	0.461	0.490	0.585	0.610	0.863	0.888
400	0.423	0.474	0.524	0.539	0.683	0.711	0.932	0.960
500	0.477	0.553	0.629	0.635	0.743	0.825	1.059	1.141
630	0.548	0.620	0.691	0.697	0.866	0.898	1.144	1.176
800	0.672	0.749	0.826	0.833	1.016	1.051	1.320	1.355
1000	0.789	0.877	0.964	0.964	1.099	1.200	1.488	1.589

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor the above factor will be multiplied by 0.63
 Fillers added in above factors

TABLE : H5 (b)

VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)

THREE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV (E) Unscreened ARM	3.3 KV (E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.374	0.634	0.990	1.142	1.604	1.782	-	
50	0.445	0.702	1.119	1.260	1.834	2.046	2.864	3.070
70	0.547	0.863	1.290	1.396	2.011	2.284	3.219	3.380
95	0.594	0.990	1.440	1.647	2.269	2.428	3.367	3.721
120	0.732	1.214	1.692	1.877	2.498	2.715	3.646	4.020
150	0.812	1.355	1.906	2.061	2.767	2.931	3.927	4.216
185	0.960	1.589	2.086	2.406	3.028	3.180	4.166	4.529
240	1.130	1.832	2.484	2.744	3.398	3.580	4.589	4.917
300	1.219	2.201	2.912	3.161	3.840	4.016	5.029	5.325
400	1.313	2.561	3.530	3.664	4.353	4.666	5.736	5.911
500	1.652	3.138	3.925	3.971	4.621	4.878	5.913	6.625
630	1.949	3.774	4.487	4.982	5.225	5.477	6.696	7.445

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor the above factor will be multiplied by 0.63
 Fillers added in above factors



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)**Effective from: 01 April 2023**

Cir. No. 07/DIV/CAB/05

08 May 2023

To Cable Division and Utilities/SEBS, listed of purchasing organisations

Sub: Amendment to Price Variation Clause for MV Cables

IEEMA MV Cable PV formula is applicable from Sep 2019. With the coming demand for cables; Cable manufacturers' requested IEEMA to publish following missing factors from formula document of MV Cable effective from Sep 2019; since some of the users were procuring such cables and demanding these factors and also for the correction in the SMIF factor for Copper Wire Metallic Screen for MV and EHV cables.

IEEMA Cable Technical committee discussed the subject in depth and IEEMA collected the variation factors and finalised in consensus. The average factors are tabled in annexure which are effective from 01 Apr 2023 and accordingly modified the formulae, attached with circular.

New evolved variation factors and corrections in formulae are as below:

1. Variation factors for Polymer (CCFAL/CCFCu), Table: H5 (a) are added for Single core unarmored XLPE insulated 3.3 to 33 KV Power cables with Al / Cu conductor
2. Variation factors for 33 KV (UE) and 3.3 KV (screened) are added
3. The formula for copper screen factor given in IEEMA MV Cable PV clause for all formulae wef Sep 19 is for copper wires only and copper tape binder if provided, its area would be additional.

The SMIF, weight factor for Copper Wire Metallic Screen has been modified as under:

SMIF = $(A \times D \times LF)/1000$, where D = Density (= 8.89 for Cu), LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape)

4. Considering the fluctuations in the prices; and as suggested by members, IEEMA will be publishing a separate price for XLPE for EHV Cables (Above 66 KV) in IEEMA Cable price variation circular from 01 Apr 2023 onwards. This price will be applicable for XLPE in all EHV Cable (Above 66 KV) formulae from 01 Apr 2023 onwards. And correction/change in existing "XLPE - HV Cable" being mentioned in IEEMA Price circulars with "XLPE - MV Cable" applicable for MV cables.
5. For the better clarity and application of prices, it is also agreed upon to change/replace the existing PVC grades "CW 22" & "HR-11" being mentioned in IEEMA Price circulars with generic PVC names as under;

CW 22 to be changed to "PVC" &
 HR 11 to be changed to "HR PVC"



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As discussed and agreed in consensus, the understanding for above generic PVC grades is that "PVC" will be considered for PVC insulation and PVC sheath of General Purpose PVC insulated LV cables as per IS 1554 (I) suitable max conductor temperature of 70 °C, whereas "HRPVC" will be considered for Heat Resisting PVC insulation and Heat Resisting PVC sheath of HRPVC insulated LV Cables as per IS 1554 (I) and also for Heat Resisting PVC sheath of XLPE insulated LV cables as per IS 7098 (I) & Heat Resisting PVC sheath of XLPE insulated HT Cables as per IS 7098 (Part-2).

6. There is regular requirement of 3.3 kV DC cables for Metro Projects, with Galvanized Steel (GS) wire/strip armouring, in view of this, Variation Factors for GS wire/ Strip armouring for Single core 3.3 kV cables are collected and the table of average variation factor is evolved.
7. As suggested by stake holders and in consensus with IEEMA Cable Tech committee, prices of Steel for armouring for following thickness are published in IEEMA Cable PVC from 01 Jan 2023 and are effective/applicable from 01 Jan 2023.
 Round wire 2.0 mm dia, Round wire 2.5 mm dia, Round wire 3.15 mm dia, Round wire 4.0 mm dia

We are enclosing amended price variation clause for MV Cables along with applicable table of variation factors and additional table of variation factors which are effective from 01 Mar 2023. We recommend all stakeholders to incorporate these changes in all the contracts/tenders henceforth for settlement of price variation from 01 Apr 2023 onwards.

Director

Encl.: Amended PV clause for MV Cables along with table of variation Factors



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)**Effective from: 01 April 2023****Material Price Variation Clause for 3.3-33 KV XLPE Insulated Armoured Single & Three core Screen Cables**

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

- P Price payable as adjusted in accordance with above appropriate formula **(in Rs/Km)**
 Po Ex-Works Price quoted/confirmed **(in Rs/Km)**

ALUMINIUM

AIF Variation factor for Aluminium

- Al Price of Aluminum. This price is as applicable **one** month prior to the date of delivery.
 Alo Price of Aluminium. This price is as applicable **one** month prior to the date of tendering.

COPPER

CuF Variation factor for copper

- Cu Price of CC copper rods. This price is as applicable **one** month prior to the date of delivery.
 Cuo Price of CC copper rods. This price is as applicable **one** month prior to the date of tendering.

POLYMER COMPOUND (PVC/PE/Zero Halogen low smoke)

- PVC Price of PVC Compound / PE / Zero Halogen low smoke. This price is as applicable on **one** month prior to the date of delivery.
 PVCo Price of PVC Compound / PE / Zero Halogen low smoke. This price is as applicable on **one** month prior to the date of tendering.

(the relevant price of Polymer Compound is to be selected depending upon the type of compound used for the cable)

- CCFAI Variation factor for PVC compound / PE / Zero Halogen low smoke for aluminum conductor cable.
 CCFCu Variation factor for PVC compound / PE / Zero Halogen low smoke for copper conductor cable.

XLPE COMPOUND

- Cc price of XLPE compound. This price is as applicable on first working day of the month, **one** month prior to the date of delivery.



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)**Effective from: 01 April 2023**

Cco Price of XLPE compound. This price is as applicable on first working day of the month, **one** month prior to the date of tendering.

XLFAL Variation factor for XLPE compound for aluminum conductor cable.

XLFCU Variation factor for XLPE compound for Copper conductor cable.

STEEL

FeF Variation factor for steel

FeW Variation factor for round wire steel armouring

Fe Price of Steel Strips/steel wire. This price is as applicable on the first working day of the month, **one** month prior to the date of delivery.

Feo Price of steel strips/steel wire. This price is as applicable on first working day of the month, **one** month prior to the date of tendering

COPPER TAPE

SMIFS Variation factor for Copper tape

SMIF1 Price of CC copper rods. This price is as applicable **one** month prior to the date of delivery.

SMIF0 Price of CC copper rods. This price is as applicable **one** month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA (PVC)/CABLE (R-1)/--/-- for the month i.e. **one** month prior to the date of tendering.

The date of delivery is the date on which the cable is notified as being ready for inspection/dispatch (in the absence of such notification, date of manufacturer's dispatch note is to be considered as the date of delivery) or contracted delivery date (including any agreed extension thereto) whichever is earlier.

Notes: All prices of raw materials are exclusive of GST amount. The details of prices are as under:

1. Price of Aluminium is LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT.
2. Price of PVC Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer/s
3. Price of XLPE Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer/s
4. Price of Polymer Compound (in Rs/MT) is the ex-work price, as quoted by the manufacturer/s
5. Price of Zero halogen low smoke (LSZH) (in Rs/MT) is the ex-work price, as quoted by the manufacturer/s
6. Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer
7. Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable)



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)

Effective from: 01 April 2023

Price variation formulae

G. For Aluminium conductor XLPE insulated 3.3 to 33 kV Single Core Armoured power cables

$P = P_o + AIF (AI - AIo) + XLFAL(CC - CCo) + SMIFS (SMIF1 - SMIF0) + CCFAI (PVCc - PVCco)$
 For Single Core unarmoured cables Aluminium factor (AIF) shall be referred from Table ALP

Table References:

ALP	Aluminium conductor Factor in single core (for unarmoured cable) ; AIF
H1	Aluminium Armour Factor for Armour with Al Cond.
H2(a)	XLPE Compound Factor ; XLFAI
H3(a)	Copper Tape Factor ; SMIFS
H5(a)	Polymer factor for Single core cable ; CCFAI

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below:

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape)

$$SMIF = (A \times D \times LF) / 1000$$

H. For Copper conductor XLPE insulated 3.3 to 33 kV Single Core Armoured power cables

$P = P_o + CuF (Cu - Cu0) + XLFCu(CC - CCo) + SMIFS (SMIF1 - SMIF0) + AIF(AI - AIo) + CCFAI (PVCc - PVCco)$

For Single Core unarmoured cables Aluminium factor (AIF) shall be 0

Table References:

CuP	Copper conductor Factor in single core ; CuF
H2(a)	XLPE Compound Factor ; XLFCu
H3(a)	Copper Tape Factor ; SMIFS
H4(a)	Aluminium Armour factor ; AIF
H5(a)	Polymer factor for Single core cable ; CCFCu

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape)

$$SMIF = (A \times D \times LF) / 1000$$



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)**Effective from: 01 April 2023****I. For Aluminium conductor XLPE insulated 3.3 to 33 kV Three Core Armoured power cables**

$$P = P_o + AIF (Al - A_{lo}) + XLFAL(CC-Cco) + SMIF (SMIF1-SMIF0) + FeF(FeF1-FeF0) + CCFAI (PVCc - PVCco)$$

For unarmoured Three Core cables, Steel Armour factor (FeF for Strip & FeW for Wire) shall be 0

Table References:

ALP	Aluminium conductor Factor in three core; AIF
H2(b)	XLPE Compound Factor ; XLFAI
H3(b)	Copper Tape Factor ; SMIF
H4(b)	Steel Strip Armour Factor ; FeF
H4(c)	Steel Wire Armour ; FeW
H5(b)	Polymer factor for Three Core cable ; CCFAI

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape)

$$SMIF = (A \times D \times LF)/1000$$

J. For Copper conductor XLPE insulated 3.3 to 33 kV Three Core Armoured power cables

$$P = P_o + CuF (Cu - C_{uo}) + XLFCu(CC-Cco) + SMIF(SMIF1-SMIF0) + FeF(FeF1-FeF0) + CCFCu (PVCc - PVCco)$$

For Three Core unarmoured cables, Steel Armour factor (FeF for Strip & FeW for Wire) shall be 0

Table References:

CuP	Copper conductor Factor in three core; CuF
H2(b)	XLPE Compound Factor; XLFCu
H3(b)	Copper Tape Factor; SMIF
H4(b)	Steel Strip Armour Factor; FeF
H4(c)	Steel Wire Armour Factor; FeW
H5(b)	Polymer factor for Three Core cable; CCFCu

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape)

$$SMIF = (A \times D \times LF)/1000$$



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IEEMA (PVC)/MV SCREEN CABLE/2019 (R-1)**Effective from: 01 April 2023****K. For Aluminium conductor XLPE insulated 3.3 kV Single Core Armoured power cables**

$$P = P_o + AIF (Al - A_{lo}) + XLFAL(CC - C_{co}) + CCFAI (PVCc - PVC_{co}) + FeF(FeF1 - FeF0)$$

For Single Core unarmoured cables Aluminium factor (AIF) shall be referred from Table ALP

Table References:

ALP	Aluminium conductor Factor in single core (for unarmoured cable) ; AIF
H1	Aluminium Armour Factor for Armour with Al Cond.
H2(a)	XLPE Compound Factor ; XLFAI
H4(d)	Steel Strip Armour Factor ; FeF / Steel Wire Armour Factor ; FeW for 3.3KV cables
H5(a)	Polymer factor for Single core cable ; CCFAI

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape) **SMIF = (A x D x LF)/1000**

L. For Copper conductor XLPE insulated 3.3 kV Single Core Armoured power cables

$$P = P_o + CuF (Cu - Cu_0) + XLFCu(CC - C_{co}) + AIF(Al - A_{lo}) + CCFAI (PVCc - PVC_{co}) + FeF(FeF1 - FeF0)$$

For Single Core unarmoured cables Aluminium factor (AIF) shall be 0

Table References:

CuP	Copper conductor Factor in single core ; CuF
H2(a)	XLPE Compound Factor ; XLFCu
H4(a)	Aluminium Armour factor ; AIF
H4(d)	Steel Strip Armour Factor ; FeF / Steel Wire Armour Factor ; FeW for 3.3KV cables
H5(a)	Polymer factor for Single core cable ; CCFCu

Note: For cases where specific Earth Fault Current through Screen is required, Screen area as approved by the customer in Datasheet/Earth Fault Current calculation of Screen shall be used to derive SMIF as below

If A= Area of Metallic Screen in Approved Datasheet / Calculation Sheet

D= Density= 8.89 for Cu. & 2.703 for Al; LF = Lay Factor (=1.07, for Copper Wire Metallic Screen and counter helix tape) **SMIF = (A x D x LF)/1000**

The PV factor for metallic screen will be computed based on approved screen area in case of cables having a specific short circuit capacity

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TABLE ALP

VARIATION FACTOR FOR ALUMINIUM (AIF)
POWER CABLES WITH ALUMINIUM CONDUCTOR
(EXCLUDING SINGLE CORE ARMoured CABLES)

Nominal Cross Sectional Area (in Sq. mm.)	1 core	3 core
25	0.073	0.219
35	0.101	0.302
50	0.137	0.410
70	0.197	0.593
95	0.274	0.821
120	0.346	1.036
150	0.425	1.279
185	0.533	1.605
240	0.703	2.099
300	0.879	2.635
400	1.126	3.374
500	1.418	4.256
630	1.828	5.494
800	2.340	7.018
1000	2.951	8.834

Annexure B

CIN No. U99999MH1970GAP014629



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TABLE CUP

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)

POWER CABLES WITH COPPER CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm.)	1 core	3 core
25	0.240	0.720
35	0.332	0.993
50	0.451	1.348
70	0.648	1.950
95	0.901	2.700
120	1.138	3.407
150	1.398	4.207
185	1.753	5.279
240	2.312	6.904
300	2.891	8.667
400	3.703	11.097
500	4.664	13.998
630	6.012	18.070
800	7.696	23.082
1000	9.706	29.055





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Table : H1

VARIATION FACTOR FOR ALUMINIUM (AIF)

ALUMINIUM ARMoured SINGLE CORE XLPE INSULATED 3.3 TO 33 KV CABLES

Nominal Cross Sectional Area (in Sq. mm.)	Aluminium Factor for Aluminium Armoured Cable with Aluminium Conductor							
	3.3 KV(E) unscreened Arm	3.3 KV(E) screened Arm	6.6 KV (E)	11 KV (E)/ 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
35	0.251	0.268	0.284	0.301	0.344	0.358	0.473	0.528
50	0.312	0.324	0.336	0.352	0.397	0.408	0.672	0.695
70	0.385	0.397	0.409	0.423	0.469	0.501	0.723	0.775
95	0.476	0.488	0.500	0.518	0.637	0.656	0.856	0.883
120	0.561	0.574	0.586	0.601	0.726	0.744	0.949	0.985
150	0.653	0.666	0.678	0.696	0.823	0.842	1.050	1.094
185	0.773	0.785	0.797	0.893	0.949	0.965	1.183	1.247
240	0.997	1.030	1.063	1.083	1.139	1.154	1.387	1.463
300	1.209	1.240	1.271	1.283	1.333	1.307	1.753	1.877
400	1.438	1.497	1.556	1.565	1.620	1.636	2.046	2.217
500	1.873	1.887	1.901	1.910	2.110	2.128	2.484	2.613
630	2.337	2.349	2.361	2.369	2.580	2.595	2.978	3.147
800	3.007	3.039	3.071	3.080	3.145	3.163	3.588	3.789
1000	3.737	3.739	3.741	3.749	3.804	3.822	4.565	4.891



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TABLE : H2 (a)

VARIATION FACTOR FOR XLPE(XLFAI/XLFCu)

SINGLE CORE ARMoured / UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross- Sectional Area (in Sq. mm.)	XLPE Factor for Armoured/ Unarmoured Cable with AL / CU Conductor							
	3.3 KV(E) unscreened Arm	3.3 KV(E) screened Arm	6.6 KV (E)	6.6 KV (UE) / 11 KV (E)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
25	0.110	0.117	0.131	0.170	0.279	-	-	-
35	0.122	0.129	0.137	0.175	0.284	0.317	0.522	0.575
50	0.135	0.144	0.151	0.191	0.307	0.341	0.563	0.620
70	0.155	0.165	0.172	0.215	0.342	0.379	0.615	0.678
95	0.174	0.185	0.193	0.241	0.377	0.417	0.670	0.732
120	0.192	0.205	0.212	0.262	0.407	0.449	0.713	0.785
150	0.209	0.223	0.229	0.283	0.437	0.481	0.757	0.832
185	0.228	0.244	0.250	0.308	0.471	0.518	0.809	0.888
240	0.255	0.271	0.279	0.343	0.519	0.569	0.883	0.961
300	0.280	0.296	0.322	0.372	0.560	0.613	0.943	1.030
400	0.326	0.345	0.392	0.420	0.625	0.683	1.041	1.133
500	0.388	0.407	0.461	0.469	0.694	0.757	1.142	1.236
630	0.467	0.490	0.520	0.529	0.777	0.845	1.265	1.356
800	0.567	0.595	0.593	0.602	0.874	0.949	1.407	1.494
1000	0.656	0.688	0.665	0.660	0.955	1.036	1.525	1.624

Note : XLPE factors include Semicons for Conductor & Insulation screen



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TABLE – H2 (b)
VARIATION FACTOR FOR XLPE (XLFAI/XLFCu)

THREE CORE ARMoured / UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH AI / Cu CONDUCTOR

Nominal Cross-Sectional Area (in Sq. mm)	3.3 KV unscreened Arm	3.3 KV screened Arm	6.6 KV (E) ARM	6.6 KV (UE)/ 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
25	0.315	0.315	0.394	0.511	0.838	-	-	-
35	0.339	0.350	0.427	0.545	0.880	0.982	1.638	-
50	0.378	0.387	0.474	0.600	0.957	1.065	1.751	1.858
70	0.435	0.445	0.541	0.679	1.067	1.183	1.916	2.034
95	0.489	0.499	0.604	0.755	1.171	1.295	2.071	2.194
120	0.537	0.554	0.661	0.822	1.265	1.396	2.210	2.355
150	0.585	0.601	0.719	0.890	1.359	1.497	2.350	2.494
185	0.642	0.660	0.784	0.968	1.468	1.614	2.513	2.665
240	0.717	0.734	0.873	1.074	1.615	1.773	2.732	2.882
300	0.781	0.804	1.006	1.167	1.744	1.928	2.919	3.089
400	0.886	0.910	1.227	1.314	1.948	2.130	3.229	3.399
500	0.956	1.085	1.421	1.446	2.148	2.381	3.588	3.689
630	1.129	1.285	1.582	1.609	2.382	2.630	3.940	4.068

Note : XLPE factors include Semicons for Conductor & Insulation screen



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TABLE – H3 (a)

VARIATION FACTOR FOR COPPER TAPE (SMIFS)

SINGLE CORE ARMoured / UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross- Sectional Area in sq.mm.	3.3 KV Screened	6.6 KV (E)	6.6 KV (UE) / 11 KV (E)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
	ARM	ARM	ARM	ARM	ARM	ARM	ARM
35	0.016	0.018	0.020	0.025	0.026	0.016	0.035
50	0.016	0.019	0.022	0.026	0.028	0.035	0.038
70	0.020	0.022	0.024	0.029	0.030	0.037	0.040
95	0.022	0.024	0.026	0.031	0.032	0.039	0.043
120	0.022	0.025	0.028	0.032	0.034	0.041	0.045
150	0.025	0.027	0.029	0.034	0.035	0.042	0.046
185	0.027	0.029	0.031	0.036	0.038	0.045	0.049
240	0.030	0.032	0.034	0.039	0.040	0.047	0.052
300	0.034	0.035	0.036	0.043	0.043	0.050	0.054
400	0.039	0.040	0.041	0.046	0.047	0.054	0.062
500	0.045	0.045	0.045	0.050	0.051	0.058	0.066
630	0.048	0.049	0.050	0.054	0.056	0.063	0.071
800	0.055	0.055	0.055	0.060	0.061	0.068	0.077
1000	0.056	0.060	0.058	0.065	0.066	0.073	0.082



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TABLE – H3 (b)

VARIATION FACTOR FOR COPPER TAPE (SMIF)

THREE CORE ARMoured / UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross-Sectional Area in sq.mm.	3.3 KV Screened	6.6 KV (E)	6.6 KV (UE) / 11 KV (E)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
	ARM	ARM	ARM	ARM	ARM	ARM	
35	0.049	0.055	0.061	0.072	0.079	-	-
50	0.053	0.059	0.065	0.076	0.083	0.104	0.123
70	0.059	0.065	0.071	0.082	0.090	0.111	0.130
95	0.065	0.071	0.077	0.088	0.096	0.117	0.137
120	0.071	0.077	0.083	0.094	0.101	0.123	0.144
150	0.076	0.082	0.088	0.099	0.106	0.128	0.149
185	0.082	0.088	0.094	0.105	0.113	0.134	0.157
240	0.091	0.097	0.103	0.114	0.121	0.143	0.166
300	0.102	0.106	0.110	0.122	0.129	0.150	0.174
400	0.120	0.122	0.124	0.135	0.142	0.164	0.198
500	0.134	0.135	0.136	0.147	0.155	0.176	0.211
630	0.149	0.149	0.149	0.160	0.168	0.190	0.228



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TABLE : H4 (a)

VARIATION FACTOR FOR ALUMINIUM (AIF)

SINGLE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH
 Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm.)	Aluminium Factor for Aluminium Armoured Cable with Copper Conductor							
	3.3 KV(E) unscreened Arm	3.3 KV(E) screened Arm	6.6 KV (E)	11 KV (E)/ 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
35	0.153	0.170	0.187	0.204	0.247	0.258	0.372	0.426
50	0.179	0.191	0.203	0.220	0.262	0.275	0.425	0.456
70	0.196	0.208	0.219	0.233	0.278	0.311	0.444	0.501
95	0.213	0.225	0.237	0.254	0.373	0.392	0.470	0.523
120	0.228	0.241	0.253	0.268	0.393	0.410	0.488	0.545
150	0.243	0.256	0.269	0.287	0.414	0.432	0.504	0.567
185	0.261	0.273	0.285	0.381	0.437	0.455	0.526	0.600
240	0.324	0.357	0.389	0.410	0.465	0.480	0.556	0.633
300	0.365	0.397	0.428	0.440	0.490	0.510	0.737	0.834
400	0.432	0.452	0.471	0.480	0.536	0.552	0.783	0.895
500	0.489	0.503	0.517	0.526	0.726	0.744	0.844	0.955
630	0.544	0.556	0.568	0.572	0.787	0.801	0.902	1.034
800	0.706	0.747	0.787	0.797	0.862	0.880	0.982	1.111
1000	0.824	0.845	0.865	0.867	0.923	0.940	1.324	1.504



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TABLE : H4 (b)

VARIATION FACTOR FOR STEEL STRIP ARMOUR (FeF)

THREE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area Sq. mm.	3.3 KV (E) unscreened arm	3.3 KV (E) screened arm	6.6 KV (E)	11 KV (E) / 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
25	0.551	0.553	0.604	0.656	0.814	-	-	-
35	0.645	0.645	0.645	0.731	0.879	0.937	-	-
50	0.675	0.684	0.703	0.761	0.937	0.966	1.181	1.301
70	0.761	0.764	0.761	0.849	0.996	1.055	1.289	1.393
95	0.820	0.828	0.849	0.907	1.083	1.113	1.348	1.454
120	0.879	0.924	0.907	0.966	1.142	1.172	1.406	1.531
150	0.966	0.988	0.966	1.055	1.201	1.259	1.494	1.592
185	1.025	1.051	1.055	1.113	1.259	1.318	1.553	1.668
240	1.142	1.147	1.142	1.231	1.377	1.406	1.641	1.760
300	1.231	1.258	1.259	1.318	1.465	1.524	1.758	1.852
400	1.348	1.402	1.406	1.435	1.582	1.641	1.876	1.990
500	1.454	1.500	1.573	1.642	1.714	1.758	2.095	2.100
630	1.632	1.680	1.745	1.943	1.889	1.918	2.150	2.280

TABLE : H4 (c)

VARIATION FACTOR FOR STEEL WIRE ARMOUR (FeW)

THREE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area in Sq. mm	3.3 KV (E) Unscreened arm	3.3 KV (E) screened arm	6.6 KV (E)	11 KV (E) / 6.6 KV (UE)	11 KV (UE)	22 KV (E)	33 KV (E)	33 KV (UE)
25	1.258	1.358	1.457	1.612	2.509	1.503	-	-
35	1.361	1.465	1.569	1.853	2.644	2.797	2.517	-
50	1.682	1.685	1.687	2.321	2.800	2.921	4.569	4.603
70	1.938	1.959	1.979	2.503	3.219	3.347	4.809	4.935
95	2.202	2.355	2.507	2.718	4.019	4.200	5.437	6.553
120	2.371	2.523	2.675	2.882	4.241	4.416	6.713	6.820
150	2.776	2.812	2.847	3.265	4.447	4.621	6.976	7.088
185	3.121	3.215	3.309	4.148	4.726	5.289	7.356	7.489
240	3.758	3.993	4.227	4.442	5.442	6.651	7.718	7.890
300	4.099	4.562	5.024	5.182	6.894	7.084	8.187	8.359
400	5.750	6.161	6.572	6.658	7.433	7.657	8.760	8.960
500	6.716	6.747	6.777	6.861	7.588	7.797	8.830	9.629
630	6.767	7.116	7.465	7.477	8.209	8.386	9.413	10.365





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TABLE : H4 (d)

VARIATION FACTOR FOR STEEL WIRE ARMOUR (FeW/FeF)

SINGLE CORE ARMoured XLPE INSULATED 3.3 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross section area in sq. mm	Single Core 3.3 kV	
	FeF	FeW
25	0.276	0.385
35	0.303	0.409
50	0.314	0.442
70	0.331	0.528
95	0.341	0.584
120	0.369	0.629
150	0.395	0.676
185	0.423	0.731
240	0.464	0.92
300	0.504	0.982
400	0.573	1.215
500	0.613	1.359
630	0.696	1.518

TABLE : H5 (a)

VARIATION FACTOR FOR Polymer (CCFAL/CCFCu)

SINGLE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV(E) Unscreened ARM	3.3 KV(E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.123	0.197	0.259	0.278	0.330	0.376	0.468	0.493
50	0.152	0.209	0.272	0.294	0.379	0.394	0.483	0.530
70	0.170	0.227	0.295	0.317	0.404	0.419	0.508	0.583
95	0.184	0.244	0.317	0.338	0.435	0.449	0.554	0.609
120	0.197	0.261	0.337	0.392	0.457	0.472	0.576	0.634
150	0.194	0.303	0.389	0.413	0.477	0.492	0.597	0.656
185	0.224	0.322	0.414	0.445	0.502	0.539	0.674	0.767
240	0.276	0.354	0.456	0.479	0.558	0.573	0.711	0.806
300	0.294	0.377	0.489	0.506	0.587	0.602	0.811	0.915
400	0.333	0.450	0.569	0.578	0.687	0.703	0.866	0.974
500	0.367	0.493	0.675	0.679	0.809	0.826	1.056	1.139
630	0.438	0.611	0.735	0.739	0.873	0.928	1.168	1.290
800	0.529	0.734	0.863	0.866	1.027	1.05	1.189	1.380
1000	0.648	0.880	1.031	1.035	1.138	1.158	1.402	1.619

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor, the above factor will be multiplied by 0.63



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TABLE : H5 (a)

VARIATION FACTOR FOR Polymer (CCFAL/CCFCu)

SINGLE CORE UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV(E) Unscreened ARM	3.3 KV(E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.158	0.191	0.224	0.252	0.323	0.342	0.361	0.380
50	0.177	0.209	0.240	0.269	0.342	0.361	0.520	0.539
70	0.198	0.232	0.265	0.296	0.370	0.391	0.551	0.572
95	0.233	0.261	0.288	0.318	0.396	0.450	0.582	0.636
120	0.253	0.282	0.310	0.342	0.454	0.477	0.613	0.636
150	0.269	0.299	0.328	0.361	0.476	0.500	0.638	0.662
185	0.292	0.323	0.354	0.420	0.508	0.532	0.719	0.743
240	0.322	0.371	0.419	0.455	0.547	0.572	0.766	0.791
300	0.355	0.408	0.461	0.490	0.585	0.610	0.863	0.888
400	0.423	0.474	0.524	0.539	0.683	0.711	0.932	0.960
500	0.477	0.553	0.629	0.635	0.743	0.825	1.059	1.141
630	0.548	0.620	0.691	0.697	0.866	0.898	1.144	1.176
800	0.672	0.749	0.826	0.833	1.016	1.051	1.320	1.355
1000	0.789	0.877	0.964	0.964	1.099	1.200	1.488	1.589

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor the above factor will be multiplied by 0.63

TABLE : H5 (b)

VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)

THREE CORE ARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH Al / Cu CONDUCTOR

Nominal Cross Sectional Area (in Sq. mm)	3.3 KV (E) Unscreened ARM	3.3 KV (E) screened ARM	6.6 KV (E) ARM	6.6 KV (UE) / 11 KV (E) ARM	11 KV (UE) ARM	22 KV (E) ARM	33 KV (E) ARM	33 KV (UE) ARM
35	0.374	0.634	0.990	1.142	1.604	1.782	-	
50	0.445	0.702	1.119	1.260	1.834	2.046	2.864	3.070
70	0.547	0.863	1.290	1.396	2.011	2.284	3.219	3.380
95	0.594	0.990	1.440	1.647	2.269	2.428	3.367	3.721
120	0.732	1.214	1.692	1.877	2.498	2.715	3.646	4.020
150	0.812	1.355	1.906	2.061	2.767	2.931	3.927	4.216
185	0.960	1.589	2.086	2.406	3.028	3.180	4.166	4.529
240	1.130	1.832	2.484	2.744	3.398	3.580	4.589	4.917
300	1.219	2.201	2.912	3.161	3.840	4.016	5.029	5.325
400	1.313	2.561	3.530	3.664	4.353	4.666	5.736	5.911
500	1.652	3.138	3.925	3.971	4.621	4.878	5.913	6.625
630	1.949	3.774	4.487	4.982	5.225	5.477	6.696	7.445

Note: The above factors are for PVC and Zero Halogen low smoke (LSZH) and for PE factor the above factor will be multiplied by 0.63





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Cir. No.: 09/DIV/LVSWGR/05

February 20, 2019

To All members of LV Switchgear and MV+HV Switchgear Division
 To all State Electricity Boards, Utilities and Other purchasing organizations

Sub: Final Price variation clauses for

1. LV Switchgear and Controlgear
2. MV AIS (Up to & Including 36 KV) Switchgear and Controlgear

IEEMA LV Switchgear and MV+HV Switchgear division has decided to revise old Price Variation clause applicable for LV and MV Switchgear (effective from January 2002) with change in cost composition and changes the sources for few raw materials which are currently in vogue.

IEEMA had circulated a Draft PV clause for LV and MV Switchgear vide cir. No. **02/DIV/LVSWGR/05** dated **January 17, 2019**. After incorporating suggestions on the above; we are making it final and operational from 1st January 2019.

We enclose separate revised PV clauses (effective from January 2019) for LV Switchgear (up to 1100 kV) and MV Switchgear (above 1100V up to 36 kV) along with sample two-step calculation. Monthly PV circulars of January 2019 as per old and new PV clauses are being published separately.

We request and recommend all the users & stakeholders including Utilities, PSUs etc. to incorporate these revised PV formula in all the new tenders/contracts.

For pending contracts, for the date of delivery on or after 1st April 2019, to arrive at the final price variation, we recommend using the following two stage method, which is a standard institutionalized methodology adopted by IEEMA for change over in all IEEMA PV clauses.

1. Calculate price variation 'P' from applicable prices/indices as per your base date / date of tendering up to January 2019 i.e. considering all prices/indices published in PV circular of January 2019 at numerator place; using IEEMA PV clause effective from January 2002.
2. Treat the above calculated 'P' as 'P₀' and calculate final price variation considering all prices / indices published in January 2019 as base prices/indices (at the denominator place) up to the applicable prices/indices as per your date of delivery; using revised LV / MV Switchgear clause effective from 1st January 2019.

A two-step sample calculation is given as annexure.

Senior Director

Price variation formula for LV SWITCHGEAR up to & including 1100 V					
	Date of Tendering	Apr-18	Date of Delivery	Apr-19	
Step I			Step II		
IEEMA SWGR PVC effective from 1st January 2002			IEEMA LV SWGR PVC effective from 1st January 2019		
% Weightages	Raw Material	Applicable month as per Date of Tendering (Apr-18)	Applicable month as per Date of Delivery (FIXED)*	% Weightages	Raw Material
25	Fix cost			21	Fix cost
17	IS	Jan-18	Nov-18	19	IS
18	C (Copper Bar)	Mar-18	Jan-19	21	C (LME Copper)
10	AL	Mar-18	Jan-19	12	AL
					In (Phenolic Moulding Powder)
13	In	Mar-18	Jan-19	15	Powder)
17	W	Dec-17	Oct-18	12	W
					Jan-19
					Oct-18
					Feb-19
					Nov-18

Price variation formula for MV AIS (Above 1100 V and Up to & Including 36 KV) for outdoor circuit breakers and switchgear				
	Date of Tendering	Apr-18	Date of Delivery	Apr-19
Step I				
IEEMA SWGR PVC effective from 1st January 2002				
Weightages	Raw Material	Applicable month as per Date of Tendering (Apr-18)	Applicable month as per Date of Delivery (FIXED)*	Applicable month as per Date of Tendering as per Date of Delivery (FIXED)#
25	Fix cost			20 Fix cost
17	IS	Jan-18	Nov-18	Nov-18
18	C (Copper Bar)	Mar-18	Jan-19	Jan-19
10	AL	Mar-18	Jan-19	Jan-19
13	In (Epoxy Resin)	Mar-18	Jan-19	Nov-18
17	W	Dec-17	Oct-18	Oct-18
Step II				
IEEMA MV SWGR PVC effective from 1st January 2019				
Weightages	Raw Material	Applicable month as per Date of Tendering (Apr-18)	Applicable month as per Date of Delivery (FIXED)*	Applicable month as per Date of Tendering as per Date of Delivery (FIXED)#
25	Fix cost			20 Fix cost
17	IS	Jan-18	Nov-18	Nov-18
18	C (Copper Bar)	Mar-18	Jan-19	Jan-19
10	AL	Mar-18	Jan-19	Jan-19
13	In (Epoxy Resin)	Mar-18	Jan-19	Nov-18
17	W	Dec-17	Oct-18	Oct-18

all prices/indices to be taken from circular ref IEEMA(PVCI)SWGR(R-1)/01/2019 for applicable month as per new PV formulae wef Jan 2019

[Signature]

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IEEMA/PVC/MVSWGR/2019 (R-2)

Effective from: 01 January 2019

PRICE VARIATION CLAUSE FOR MV AIS (Above 1100 V and Up to & Including 36 KV)
 SWITCHGEAR AND CONTROLGEAR

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(20 + 28 \frac{IS}{IS_0} + 26 \frac{C}{C_0} + 4 \frac{AL}{AL_0} + 9 \frac{In}{In_0} + 13 \frac{W}{W_0} \right)$$

Wherein,

- P = Price payable as adjusted in accordance with the above formula.
- P₀ = Price quoted/confirmed. (Exclusive of all taxes & duties)
- IS₀ = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100)(refer notes)
 This index number is as applicable for the month, THREE month prior to the date of tendering.
- C₀ = Average LME settlement price of copper wire bars (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.
- AL₀ = Price of busbar grade aluminium (refer notes)
 This price is as applicable on the 1st working day of the month, ONE month prior to the date of tendering.
- In₀ = Price of epoxy resin for indoor circuit breakers and switchgear (refer notes)
 This price is as applicable on the 1st working day of the month, ONE month prior to the date of tendering.
 OR Whole sale price index of Insulator for outdoor circuit breakers (VBF and SDB) (refer notes)
 This index number is as applicable for the month, THREE month prior to the date of tendering.
- W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
 This index number is as applicable for the month, Four months prior to the date of tendering.

For example, if date of tendering of indoor circuit breakers falls in April 2019, applicable prices of Copper (C₀), Aluminium Busbar (AL₀) and Insulating Material (In₀) should be as on 1st March 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (S₀) and all India average consumer price index no. (W₀) should be for the month of January 2019.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/SWGR(R-1)/ / ONE month prior to the date of tendering.

IEEMA/PVC/MVSWGR/2019 (R-2) page 1 of 3



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IEEMA/PVC/MVSWGR/2019 (R-2)

Effective from: 01 January 2019

- IS** = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100)(refer notes)
This index number is as applicable for the month, **FOUR** month prior to the date of delivery.
- C** = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, **TWO** month prior to the date of delivery.
- Al** = Price of busbar grade aluminium (refer notes).
This price is as applicable on the 1st working day of the month, **TWO** month prior to the date of delivery.
- In** = Price of epoxy resin for indoor circuit breakers and switchgear (refer notes)
This price is as applicable on the 1st working day of the month, **TWO** month prior to the date of delivery.
OR Whole sale price index of Insulator for outdoor circuit breakers (VBF and SDB) (refer notes)
This index number is as applicable for the month, **FOUR** month prior to the date of delivery.
- W** = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
This index number is as applicable for the month, **FIVE** months prior to the date of delivery.

For example, if date of delivery of indoor circuit breakers in terms of clause given below falls in June 2019, applicable prices of Copper (C_0), Aluminium Busbar (Al_0) and Insulating Material (In_0) should be as on 1st April 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (S_0) and all India average consumer price index no. (W_0) should be for the month of February 2019.

The date of delivery is the date on which the product is notified as being ready for inspection/despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes

- a) All prices of raw materials are exclusive of modvatable GST/CV duty amount and exclusive of any other central, state or local taxes, octroi etc.
- b) The details of prices are as under:
1. The wholesale price index number for 'Manufacture of Basic Metals' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100
 2. The LME price of Copper Wire Bars (In Rs./MT) is the LME average settlement price of Copper Wire Bars converted into Indian Rupees with applicable average exchange rate of SBI of the month. This price is the landed cost, Inclusive of applicable customs duty only but exclusive of countervailing duty

Annexure B

IEEMA/PVC/MVSWGR/2019 (R-2)

Effective from: 01 January 2019

3. The price of busbar grade aluminium (in Rs/MT) is the average of ex-works price as quoted by the two primary producers for the busbar size 152.4 x 6.35 mm flat approximately, grade equivalent to E91 E as per IS 5082-1998 (or the latest).
4. The price of insulating material (in Rs/Kg) is the price of epoxy resin quoted by a resin manufacturer for their grade CT 5900 or its nearest equivalent applicable for indoor circuit breakers and switchgear above 1100 V and Up to & Including 36 KV.
5. The wholesale price index number for 'Insulators' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100 applicable for outdoor circuit breakers (VBF and SDB) above 1100 V and Up to & Including 36 KV.


Senior Director

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Cir. No. 09/PVC/MV-HV SWGR/05**18th July 2022**

To Members of MV-HV Switchgear Division
 To all State Electricity Boards, Utilities and Other purchasing organizations

Sub: Final Price Variation Formulae for MV Gas insulated Switchgear (MV GIS)

Gas Insulated Switchgear (GIS). GIS is high value product with a mix of various domestic and imported raw materials/components and having manufacturing time of around 12-15 months. MV-HV Switchgear division of IEEMA has decided to evolve new PV Clause for **MV Gas insulated Switchgear**.

IEEMA has collected costing data from major manufacturers of MV GIS and arrived at the draft Price Variation Clauses – separate up to 12 KV and 12-36 KV which was circulated vide cir no 01/PVC/MV-HV SWGR dated 3rd Jan 2022 to all stake holders for their review/comments.

Only Exchange rate has been considered to represent the imported portion of the GIS in terms of value; which is to be declared and mutually agreed between supplier and purchaser along with basket of currencies with appropriate cost weightages; aggregating to not more than 8 as given in above PV formula.

Since there are no adverse comments received; we are making it operational from 1st June 2022.

We have enclosed PV clauses applicable for MV Gas insulated Switchgear (MV GIS) which are effective from 1st June 2022.

We request and recommend all the users & stakeholders including Utilities, PSUs etc. to incorporate this new PV formulae in all the new tenders/contracts henceforth.

Director

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IEEMA(PVC)/ MV GIS-up to 12 KV

Effective from: 1st June 2022

**PRICE VARIATION CLAUSE FOR MEDIUM VOLTAGE GAS INSULATED SWITCHGEAR (MV GIS)
 UPTO AND INCLUDING 12 KV**

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(22 + 14 \frac{IS}{IS_0} + 12 \frac{S}{S_0} + 24 \frac{Cu}{Cu_0} + 4 \frac{Al}{Al_0} + 4 \frac{ER}{ER_0} + 8 \frac{EC}{EC_0} + 12 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

IS₀ = Price of HR Coil 3.15 mm (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of tendering.

S₀ = Wholesale price index number for 'Stainless steel coils, strips and sheets' (Base: 2011-12=100)
 (refer notes)
 This price is as applicable for the month, **THREE** months prior to the date of tendering.

Cu₀ = Price of CC copper rods (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of tendering.

Al₀ = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of tendering.

ER₀ = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of tendering.

EC₀ = IEEMA's Banker's selling rate of exchange for select foreign currencies prevailing as on first working day (refer notes)
 This exchange rate is as applicable **ONE** month prior to the date of tendering.

W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, **THREE** months prior to the date of tendering.



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IEEMA(PVC)/ MV GIS-up to 12 KV

Effective from: 1st June 2022

For example, if date of tendering falls in June 2022, applicable prices of HR Coil (IS_0), Copper (Cu_0), Aluminium (Al_0), Epoxy Resin (ER_0) and Exchange rate (EC_0) should be as on May 2022 and Wholesale price index number for 'Stainless steel coils, strips and sheets' (S_0) and all India average consumer price index no. (W_0) should be for the month of March 2022.

The above prices and indices are as published by IEEMA vide circular reference number
IEEMA(PVC)GIS/___/___ ONE month prior to the date of tendering.

- IS = Price of HR Coil 3.15 mm (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- S = Wholesale price index number for 'Stainless steel coils, strips and sheets' (Base: 2011-12=100)
 (refer notes)
 This price is as applicable for the month, THREE months prior to the date of delivery.
- Cu = Price of CC copper rods (refer notes)
 This price is as applicable for the month, TWO months prior to the date of delivery.
- Al = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, TWO months prior to the date of delivery.
- ER = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, ONE month prior to the date of delivery.
- EC = IEEMA's Banker's selling rate of exchange between foreign currencies prevailing as on first
 working day (refer notes)
 This exchange rate is as applicable ONE month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the
 Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, THREE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of HR Coil (IS), Epoxy Resin (ER) and Exchange rate (EC) should be as on November 2022 and Copper (Cu), Aluminium (Al) should be as on October 2022, and Wholesale price index number for 'Stainless steel coils, strips and sheets' (S) and all India average consumer price index no. (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number
IEEMA(PVC)GIS/___/___ ONE month prior to the date of delivery.



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IEEMA(PVC)/ MV GIS-up to 12 KV**Effective from: 1st June 2022**

The date of delivery is the date on which the MV GIS is notified as being ready for inspection/despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

- a) All prices of raw materials are exclusive of GST/CV duty amount and exclusive of any other central, state or local taxes etc.
- b) The details of prices are as under:
 1. The Price of 8 mm CC copper rod (in Rs/MT) is ex-works price as quoted by the primary producer.
 2. Price of Steel is the average retail price of steel HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT
 3. Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT using exchange rate and adding appropriate customs duty.
 4. The wholesale price index number for 'Stainless steel coils, strips and sheets' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100
 5. The price of Epoxy resin is price quoted by resin manufacturer for their grade CT 5900 or its nearest equivalent.
 6. The exchange rates in Indian Rs. would be for the following currencies only.

1) US Dollars	2) pound Sterling	3) Japanese Yen	4) Euro
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Exchange rate is to represent the imported portion of the GIS in terms of value; which is to be declared and mutually agreed between supplier and purchaser along with basket of currencies with appropriate cost weightages; aggregating to not more than 8 as given in above PV formula

Authorised Signatory

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IEEMA(PVC)/ MV GIS- Above 12 KV up to 36 KV

Effective from: 1st June 2022

**PRICE VARIATION CLAUSE FOR MEDIUM VOLTAGE GAS INSULATED SWITCHGEAR (MV GIS)
 ABOVE 12 KV UPTO & INCLUDING 36 KV**

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(16 + 16 \frac{IS}{IS_0} + 8 \frac{S}{S_0} + 18 \frac{Cu}{Cu_0} + 5 \frac{Al}{Al_0} + 6 \frac{ER}{ER_0} + 16 \frac{EC}{EC_0} + 15 \frac{W}{W_0} \right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

IS₀ = Price of HR Coil 3.15 mm (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

S₀ = Wholesale price index number for 'Stainless steel coils, strips and sheets' (Base: 2011-12=100)
 (refer notes)
 This price is as applicable for the month, THREE months prior to the date of tendering.

Cu₀ = Price of CC copper rods (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

Al₀ = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

ER₀ = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, ONE month prior to the date of tendering.

EC₀ = IEEMA's Banker's selling rate of exchange between foreign currencies prevailing as on first working day (refer notes)
 This exchange rate is as applicable ONE month prior to the date of tendering

W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, THREE months prior to the date of tendering.



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IEEMA(PVC)/ MV GIS- Above 12 KV up to 36 KV**Effective from: 1st June 2022**

For example, if date of tendering falls in June 2022, applicable prices of HR Coil (IS₀), Copper(Cu₀), Aluminium (Al₀), Epoxy Resin (ER₀) and Exchange rate (EC₀) should be as on May 2022 and Wholesale price index number for 'Stainless steel coils, strips and sheets' (S₀) and all India average consumer price index no. (W₀) should be for the month of March 2022.

The above prices and indices are as published by IEEMA vide circular reference number
IEEMA(PVC)GIS/ __/___ ONE month prior to the date of tendering.

- IS = Price of HR Coil 3.15 mm (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- S = Wholesale price index number for 'Stainless steel coils, strips and sheets' (Base: 2011-12=100)
 (refer notes)
 This price is as applicable for the month, **THREE** months prior to the date of delivery.
- Cu = Price of CC copper rods (refer notes)
 This price is as applicable for the month, **TWO** months prior to the date of delivery.
- Al = LME CSP Average of Aluminium (refer notes)
 This price is as applicable for the month, **TWO** months prior to the date of delivery.
- ER = Price of Epoxy resin (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- EC = IEEMA's Banker's selling rate of exchange between foreign currencies prevailing as on first
 working day (refer notes)
 This exchange rate is as applicable **ONE** month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the
 Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of HR Coil (IS), Epoxy Resin (ER) and Exchange rate (EC) should be as on November 2022 and Copper (Cu), Aluminium (Al) should be as on October 2022, and Wholesale price index number for 'Stainless steel coils, strips and sheets' (S) and all India average consumer price index no. (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number
IEEMA(PVC)GIS/ __/___ ONE month prior to the date of delivery.



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IEEMA(PVC)/ MV GIS- Above 12 KV up to 36 KV**Effective from: 1st June 2022**

The date of delivery is the date on which the MV GIS is notified as being ready for inspection/despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

- a) All prices of raw materials are exclusive of GST/CV duty amount and exclusive of any other central, state or local taxes etc.
- b) The details of prices are as under:
 1. The Price of 8 mm CC copper rod (in Rs/MT) is ex-works price as quoted by the primary producer.
 2. Price of Steel is the average retail price of steel HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT
 3. Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT using exchange rate and adding appropriate customs duty.
 4. The wholesale price index number for 'Stainless steel coils, strips and sheets' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100
 5. The price of Epoxy resin is price quoted by resin manufacturer for their grade CT 5900 or its nearest equivalent.
 6. The exchange rates in Indian Rs. would be for the following currencies only.

1) US Dollars	2) pound Sterling	3) Japanese Yen	4) Euro
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Exchange rate is to represent the imported portion of the GIS in terms of value; which is to be declared and mutually agreed between supplier and purchaser along with basket of currencies with appropriate cost weightages; aggregating to not more than 8 as given in above PV formula

Authorised Signatory

Annexure 2

LKE (02)-01: Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main Sub Stations Including 750 volts DC 3rd Rail Traction System, 33kV Cable Network, ASS, TSS & SCADA System for East West Corridor (Phase 1 B) of Lucknow Metro Rail Project at Lucknow, Uttar Pradesh, India.

System, RSS/AMS, Traction & Power Supply, 750V DC 3rd Rail Installations and provide and guarantee supply of spares.

A1.5 Deleted.

A2. Source of Funds

This work shall be financed in terms of Clause 1.3 of NIT.

A3 Eligible Tenderers, Eligible Source Countries for materials, Plant and Services

A3.1 The tenders for this contract will be considered only from those tenderers (proprietorship firms, partnerships firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in the clause 1.4.1 ~~(ii)~~ ~~(a)~~ of NIT.

A3.2 A Tenderer (applies to each individual member in case of a Joint Venture/Consortium) that has been determined to be ineligible in accordance with Clause A4.4 to A4.7 of ITT, shall not be eligible to be awarded a contract.

A3.3 Tenderers shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

A4 Qualification of the Tenderer

A4.1 The Tenderer shall submit a written power of attorney, duly notarized, authorising the signatory (ies) of the Tender to commit the tenderer along with Board Resolution confirming authority on the persons issuing the Power of Attorney for such actions. In case of partnership, consortium or joint venture, notarized Power of Attorney(s) and Board Resolution(s) for each member of the partnership, consortium or joint venture shall be submitted. In case of Foreign Partners, Power of Attorney(s) and Board Resolution confirming authority on the persons issuing the Power of Attorney for such actions shall be submitted duly notarized by the notary public of country of origin and should be either stamped by Embassy/High Commission or Member Countries of Hague convention may submit these document with "Apostille" stamp. Also in case the documents are in foreign language the translation of the same shall be authenticated by Embassy/High Commission.

A4.2 Each Tenderer (each member in the case of joint venture or consortium) is required to confirm and declare with his Tender that no agent, middleman or any intermediary has been, or will be, engaged to provide any services, or any other item or work related to the award and performance of this Contract and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the tender price will not include any such amount. To fulfil this requirement, the tenderer (each member in case of JV/Consortium) has to sign the declaration given as **Appendix-11 of FOT**. If the Employer subsequently finds to the contrary, the Employer reserves the right to declare the Tenderer as non-compliant, and declare any Contract if already awarded to the Tenderer to be null and void.

A4.3 Deleted.

A4.4 Standard of Ethics

A4.4.1 UPMRCL requires that Tenderers and Contractors observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, UPMRCL:

- a) will reject a proposal for award if it determines that the Tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- b) will recognize a Tenderer or Contractor as ineligible, for a period determined by UPMRCL, to

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- B4.1 During the tender period, the Employer may issue further instructions to tenderers or any modifications to existing tender documents in the form of an addendum. Such an amendment in the form of an addendum will be uploaded on the e-tendering portal <https://etenders.gov.in/eprocure/app> within the date given in NIT which shall be available for all the prospective tenderers who have purchased the tender document in the tender period. In case of delay beyond the last date of issuing addendum given in NIT, the date of submission, at its sole discretion may be extended by UPMRCL under **Clause D1.22-6 of ITT**.

Without prejudice to the order of preference as specified in Clause 1.5 of General Conditions of Contract, the provisions in such addenda shall take priority over the Invitation to Tender and Tender Documents issued previously. Tenderers should download and acknowledge receipt of such addenda and include them in the tender submittal. (In the format given in Appendix-24 & 28 of Form of Tender)

- B4.2 The Tenderer should note that there might be aspects of his Tender and/or the evaluation documents submitted with the Tender that will necessitate clarification. It is intended that any aspect of the said evaluation documents and any amendments or clarification which are to have contractual effect will be incorporated into the Contract either:

- (a) by way of Special Conditions of Contract to be prepared by the Employer and agreed in writing by the Tenderer prior to and conditional upon acceptance of the Tender; or
- (b) by the Tenderer submitting, at the written request of the Employer, documents which are expressly stated to form part of the Tender, whether requested before or after submission of the documents forming part of the Tender, identified in paragraphs C2.3(a) to C2.3(g) below, and whether as supplements to, or amended versions of such documents.

Save as aforesaid, all such amendments or clarifications shall have contractual effect. Requests for clarification and the tenderers responses shall be made in writing.

C. Preparation of Tenders

C1 Language

Tenders and all accompanying documents shall be in English. In case any accompanying printed literature is in other languages, it shall be accompanied by an English translation. The English version shall prevail in matters of interpretation.

C2. Documents Comprising the Tender

- C2.1 The Tenderer shall, on or before the date and time given in the Notice of Invitation to Tender, upload his Tender on e-tendering portal <https://etenders.gov.in/eprocure/app> in accordance with the provision in Clause D1 of ITT.

-Technical Package of contract: LKE (02)-01 and

-Financial Package of contract: LKE (02)-01 as per the provisions given in **Clause C15 below**.

Technical Package of this submission shall contain all the documents referred to in the subsequent paragraphs C2.2 and C2.3 including all Annexures & Appendixes of NIT, ITT and FOT respectively except pricing document as per Clause C2.2 (c).

Financial Package shall contain Bill of Quantity (BOQ) / Pricing Document of the tender documents duly filled in and complete in all respect as per **Clause C2.2 (c) (see paragraph C10 and C15)**.

In submission of the Tender (Tender Security, Technical Package and Financial Package), Tenderer(s) shall assign person(s) in writing to submit the tender accompanied by the original of the Tender Security (if Tender Security is to be submitted in form of BG/ FDR/ DD which shall be submitted in a separate envelope).

Should any further documents be required pursuant to paragraphs C2.2(o) and C2.3(h) below, the Tenderer will be instructed by the Employer which Package of the Tenderer's submission is to contain such documents.

The Tenderer shall ensure that a receipt/acknowledgement is obtained for the submission of his Tender at e-tendering portal <https://etenders.gov.in/eprocure/app>. Such receipt/acknowledgement shall be

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- (s) Appendix 17 to the Form of Tender: Undertaking as per Clause 1.4.1 ix (d) of NIT
- (t) Appendix 18 to the Form of Tender: Performa for Submission of the List of the Goods, Works & Services Tentatively Proposed to be Offered with Local Value Addition
- (u) Appendix 19 and 19A to the Form of Tender: Undertaking as per Clause 1.4.1 v(a) & (b) of NIT and Undertaking as per Clause 1.4.1 v(c) of NIT.
- (v) Appendix 20 to the Form of Tender: Undertaking for not being penalised in a Contract
- (w) Appendix 21 to the Form of Tender: Undertaking for Financial stability.
- (x) Appendix 22 to the Form of Tender: Pending Litigation as per Clause 1.1.3.1 v(f) of NIT
- (y) Appendix 23 to the Form of Tender: Undertaking as per Clause 1.4.1 x of NIT.
- (z) Appendix 24 to the Form of Tender: UNDERTAKING FOR DOWNLOADED TENDER DOCUMENT / ADDENDUM
- (aa) Appendix 25 to the Form of Tender for Details of Bank Account for refund of Tender Security/EMD.
- (bb) Annexure 4 to the Instruction to tenderer : Requirements for Tenderer's Technical Proposals
- (cc) Annexure 2 to the Instruction to tenderer : Requirements for Tender Program
- (dd) Annexure 14 to the Instruction to tenderer : Project Organisation (Minimum key staff Required)
- (ee) Same as point (dd) above.
- (ff) Same as point (dd) above.
- (gg) Annexure 3 to the Instruction to tenderer : Resources Proposed for the Project- Plants & Equipments
- (hh) Annexure 6 to the Instructions to the tenderer: Form of Bank Guarantee for Tender Security
- (ii) Annexure 6A to the Instruction to tenderer : Undertaking for encashment / forfeiture of Tender Security
- (jj) Annexure 12 to the Instruction to tenderer : Statement for Code of Integrity
- (kk) Annexure 9B to the Instruction to tenderer : Statement for Covenant of Integrity
- (ll) Annexure 9A to the Instruction to tenderer: Form of Integrity Pact.
- (mm) Any further documents which have been requested in accordance with paragraph B4.2above.
- (nn) Appendix 27 to the Form of Tender: Participation letter
- (oo) **Deleted**
- (pp) Annexure-10 to the ITT: Details of Foreign Currency
- (qq) Appendix 298 to the Form of Tender: **Power of Attorney(s)** (see paragraph A4)

(rr) Appendix 306 to the Form of Tender: The Structure of the Tenderer

(ss) Annexure 6A to ITT: Undertaking for Encashment/Forfeiture of Tender Security;

(ss)(tt) One Set of complete tender documents with stamped and signature by the authorized signatory of the Tenderer.

All original tender documents issued by Employer are part of Technical Package except the volume containing the Bill of Quantities (BOQ/Pricing Document) which shall be filled and submitted in Financial Package. Tenderers should carefully read and note all the conditions and provisions mentioned in original tender documents issued by Employer and it shall be deemed that all the conditions and

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provisions of these documents have been included in their tender submission and accepted to them. The tender shall be submitted online by using class-II/III digital signature of the authorized signatory of the tenderer.

C2.3 The Tenderer shall submit with his Tender the documents that are identified in paragraphs C2.3(a) – C2.3(h) inclusive. Such documents will be used for the purposes of evaluating and analysing the Tender but will not form part of the Contract unless the same shall have been expressly incorporated into the Contract in accordance with paragraphs B4.1 or B4.2 above.

- (a) Full details of ownership and control of the Tenderer;
- (b) Tender Program including Design Submission Program (see paragraph C8);
- (c) Undertaking of scope of works (see Appendix-K of Annexure-4 of ITT);
- (d) Details of works including specialized works if already decided to be sub-contracted (see paragraph C11 & submit details in Appendix B (1) of Annexure-4 of ITT);
- (e) Details of providers of Performance Guarantees (see paragraph C19 below);
- (f) Details of Contractor's Machinery (see paragraph C13 below);
- (g) Any further documents which are requested in writing by Employer before submission of the Tender by way of evaluation documents, but which are not to form part of the Contract;
- (h) Following information shall be furnished:
 - (i) Extent of participation by each member of the JV/Consortium in terms of percentage of the value of the proposed Contract.

Member	% of participation
--------	--------------------

A	
B	
C	

(ii) The tenderer should supply the following information, separately for each member of the JV/Consortium.

- (a) Maximum value of "similar works (as defined in **NIT Clause 1.4.2**)" executed in any one year during the last 5 years (in Rs. equivalent).
- (b) Value of the commitments and on-going works, on a yearly basis, pertaining to Traction and Power supply works, to be completed during the completion period of this NIT from the first date of the month of the tender submission.

Both (a) and (b) should be updated to price level of last day of the month previous to the month in which the tender is submitted by assuming 2% (simple) inflation on foreign currency and 5% (simple) on Indian currency. For conversion of foreign currency, please refer **Clause E5.3 of ITT**.

C2.4 The Employer may get, from the Government, partial or complete waiver of taxes, royalties, duties, cess, octroi, and other levies payable to various authorities. The Contractor shall maintain complete records of the amounts paid on these accounts and advise the Employer the details every month. In case the waiver becomes effective, the Contractor will be advised on the process to be followed to obtain the refund from the concerned authority. The Contractor shall arrange for the remittance of the refund to the Employer. In case of failure by the Contractor to remit such amounts, the same shall be recovered from amounts due for payment to the Contractor.

With the tender submission, the tenderer shall submit the proof of GST registration in the **Uttar Pradesh** or shall submit an undertaking that he will get registered with GST authorities in the state of **Uttar Pradesh** in case of award of LOA to them.

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C13. Contractor's Machinery

The Tenderer shall submit with his Tender a schedule of the main items of machinery which he intends to use for carrying out the works, indicating the activities for which each item will be used. The Tenderer shall specify in each case:

- (a) If he owns or intends to purchase such items, and
- (b) If he intends to enter into hire, hire purchase or leasing or charter-party arrangements

The Tenderer shall note that it is a condition of contract that the minimum machinery mentioned in above proposal shall be augmented as considered necessary to meet the requirement of the work at site.

Tenderers are required to submit details and undertaking as given in clause B5 of Annexure-4 of ITT.

C14. Not Used

C15. Pricing Document

C15.1 The Pricing Document is included in Bill of Quantities/Pricing Document; Volume-7.

The Tenderer shall complete the Pricing Document in accordance with the instructions given in Bill of Quantity/Pricing Document. The completed Pricing Document including price of minor deviations in Appendix-C of Annexure-4 of ITT for such deviation as mentioned in Appendix A of Annexure-4 of ITT shall be submitted.

C15.2 The price of each such minor deviation will be the price which the tenderer agrees to offer to the employer from his quoted offer in deviation is agreed by the employer. Any such deviation without a price shall not be considered and the same shall be treated as withdrawn by the tenderer. Any other deviation mentioned anywhere in the submission other than in **Appendix A of Annexure-4 of ITT** shall be considered as if mentioned inadvertently by the tenderer and shall be considered as withdrawn without any confirmation from the tenderer.

C15.3 The Tenderer is to note the Key Dates as given in Appendix 1A of FOT & Chapter 4 Employer's Requirement (Volume 4). These are to be adhered to strictly failing which Liquidated Damages will be imposed as per clause 8.5 of GCC. Prior to Date of Commencement, Key Dates will be converted to calendar dates.

C15.4 The Tenderer shall also submit Acknowledgment of Pact of Integrity which shall be signed and dated by the Tenderers authorized representative, as per format provided in Annexure – 9 of ITT. The Tenderer shall also submit Acknowledgment of Compliance with applicable Guidelines for Procurement of Loans, which shall be signed and dated by the Tenderer's authorized representative, as per format provided in **Annexure – 413 of ITT**.

C16. Currencies of Tender and Payment

C16.1 **The Tenderer may give his priced offer in INR, Euro or USD. The detail of currencies utilized in the tender offer shall be submitted in Annexure- 10 of ITT.**

C16.2 Interim on-account stage payments shall be made as laid down in the Bill of Quantity/ Pricing Document. The payment at each stage shall be paid in **INR, Euro or USD** as per the proportion in the quoted price by the tenderer.

C16.3 For the purpose of comparative evaluation of the offers, all tender prices will be converted to Indian Rupees by using the Exchange (selling) rates for those currencies at the close of business of the State Bank of India 28 days before the latest date for submission of Tenders.

C17. Tender Validity

The Tender shall be valid for a period of 180 days from the Submission end Date of Tenders. In exceptional circumstances, prior to expiry of the original tender validity period, the Employer may

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ANNEXURE- 2 of NIT

Financial DATA

Tenderer's name

Date

Each Applicant or member of a JV must fill in this form (as per Standalone financial statement)

S.N.	Description	Financial Data for Latest Last 5 Years (Indian Rupees)				
		<u>2020-21</u> <u>2021-22</u>	<u>2021-22</u> <u>2022-23</u>	<u>2022-23</u> <u>2023-24</u>	<u>2023-24</u> <u>2024-25</u>	<u>2024-25</u> <u>2025-26</u>
1.	Total Assets					
2.	Current Assets					
3.	Total External Liabilities					
4.	Current Liabilities					
5.	Annual Profits Before Taxes					
6.	Annual Profits After Taxes					
7.	Net Worth [= 1 - 3]					
8.	Working Capital [=2 - 4]					
9.	Return on Equity					
10	Annual turnover (from construction)					
11	Gross Annual turnover					

Attach copies of the audited balance sheets, including all related notes, income statements for the last five audited financial years, as indicated above, complying with the following conditions.

1. Separate Performa shall be used for each member in case of JV/Consortium.
2. All such documents reflect the financial data of the Applicant or member in case of JV, and not sister or Parent Company.
3. Historic financial statements shall be audited by Statutory Auditor of the Company under their seal & stamp and shall be strictly based on Audited Annual Financial results of the relevant period(s). No statements for partial periods will be accepted.
4. Historic financial statements must be complete, including all notes to the financial statements.
5. Foreign applicants, in whose country calendar year is also the financial year, may submit all relevant data for the last 5 years i.e. 2020, 2021, 2022, 2023 and 2024 and 2025. Selling rate of exchange at the close of business of the State Bank of India on the day twenty-eight days before the submission end date of Tender shall be considered for calculating equivalent value in INR
6. Return on Equity = Net Income / Shareholders Equity
Return on Equity = Net Income is for the full fiscal year (before dividends paid to common stock holders but after dividends to preferred stock).
Shareholders equity does not include preferred shares.
7. The above Annexure shall be duly certified by Chartered Accountant / Company Auditor under his signature, membership no., UDIN & stamp.

**Signature of authorized signatory
on behalf of Tenderer**

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Annexure 2A of NIT

Affidavit for Unaudited Balance Sheet

(On a non-judicial stamp paper of appropriate value)

(To be filled by the bidder' in case their Balance Sheet for F.Y. ~~2025-26~~ ~~2024-25~~ has not been audited. If the Balance sheet for F.Y. ~~2025-26~~ ~~2024-25~~ has been audited, then the bidder need not to fill this form or may simply write "NOT APPLICABLE")

I.....(Name and designation of Authorised signatory)
of.....(Name of Company/ Firm Proprietorship/ Partnership) hereby
confirm that the Balance sheet for Financial year F.Y. ~~2025-26~~ ~~2024-25~~ has actually not been audited/
or under finalisation so far.

**Signature of authorized signatory
on behalf of Tenderer**

Annexure 3

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ANNEXURE-4 of NIT

AVAILABLE BID CAPACITY

(The financial data in this prescribed format shall be certified by Chartered Accountant /Company Auditor under his signature & stamp with UDIN).

Applicant's legal name**Date.....**

Financial Year	Annual turnover of Firm (in Crores)	Escalated value of construction work executed by Firm (in Crores) (5% (simple) inflation for Indian Rupees every year and 2% (simple) for foreign currency portions per year) upto last date of previous month to tender submission end date
~~2020-21~~ <u>2021-22</u>		
~~2021-22~~ <u>2022-23</u>		
~~2022-23~~ <u>2023-24</u>		
~~2023-24~~ <u>2024-25</u>		
~~2024-25~~ <u>2025-26</u>		
Value of construction work executed (in Crores)		
Maximum of escalated value of construction work executed by Firm (in Crores) (A)		
Value of Balance work in hand for a period of this NIT (in Crores) (B)		
Available Bid Capacity = 2 * A * N - B (Rs in Crores) should be more than NIT Value (Where N is number of years prescribed for completion of work in NIT)		

**Signature of authorized signatory
on behalf of Tenderer**

- It shall be possible to bypass any TSS and restoring power to third rail by a single command from OCC or locally from inside of TSS.
- Emergency Trip System to be designed at all station & Depot wherever required for ensuring the safety of personnel as per NFPA 130.
- Minimum number of TSS shall be 5 (five) for main line and one TSS for depot.
- Minimum number of two inverters shall be provided at suitable location for recuperation of maximum regenerative energy. The Contractor will be required to design and select TSS locations for inverter installation which provides the highest recovery of regenerative energy.
- The Contractor can also propose additional locations for installation of inverters where additional cost can be justified by recovery of energy. This shall be subject to the approval of the Engineer. Additional cost shall be payable to the contractor based on the price agreed in the contract for such additional inverter (i.e. beyond ~~two~~ ~~four~~ numbers of inverters).
- Configuration of inverter shall be designed and submitted to employer for approval.
- The minimum capacities of major equipment for Traction Sub Station (TSS) are as under:

S. No.	Major Equipment	Capacities/Ratings
1	33kV AIS (RSS / depot / elevated) / GIS (Underground section)	1250A
2	Rectifier	2500 kW
3	HSCB	Incomer 6000A, Busbar 10000A and Outgoing 4000A
4	Inverter	1000kW
5	DC cables	300 Sq.mm Copper 6 runs per feeder

2.5.6. Third Rail System

- Design of the complete third rail system for mainline and depots is in the scope of LKE (02)-01 Contractor.
- Current carrying capacity of conductor rail shall be capable of taking the entire traction load for design year requirement.
- Contractor shall submit a concept third rail sectioning philosophy along with provision of remote operated isolators for the approval of the Engineer.
- Sectioning of third rail in the main lines shall be designed considering the train can be received at platform in case of failure in next section.
- Sectioning at crossover shall be designed for permitting both single line train operation and short turn back in both directions in event of failure in any given section.
- Sectioning of third rail in the depot shall be designed considering the operation of main line shall not be affected.
- Rails of Main line, Depot to be kept at floating voltages excluding the following area:
 - Inspection Bay Line (IBL) area
 - Washing Bay Line (WBL)
 - Pit Wheel Line (PWL)
- IBL area, WBL & PWL at Depot is to be kept earthed.
- Gap analysis with ramp design is to be done by LKE (02)-01 Contractor.
- The ramp design shall be rugged, suitable for withstanding arcing due to repeated braking of full load current of trains without undue wear. All possibilities of avoiding break before make shall be explored and implemented.
- There shall be a secondary insulation at support level.
- The Contractor shall design third rail to earth insulation to high value keeping intended value of 100 ohm-km for running rail in dry condition. This value shall be specified by the contractor at design stage and validated at testing stage.
- Mechanical Loading: The expected worst-case static and dynamic loading in both vertical (downwards and upwards) and horizontal (parallel and perpendicular to the rail) direction shall

Annexure 5

UPMRC Tender No. LKE(02)-01

Financial Package: Pricing Document - Bill of Quantities

Item No.	Work Description	Explanation (BOQ Bill Nos. 11.1– Misc Items)
		• 16A sockets in a lockable enclosure IP65 and suitable fixing arrangement, placed along on • one side of the viaduct, side line, ramp area (upto the scope of viaduct contractor). The price shall cover the cost of design, supply erection, testing & commissioning of providing the following but not limited to: • Cables and cable connection/termination from the appropriate station panel, suitable for • carrying the current required by the 16A sockets, 3-phase. The cable should be designed for carrying a continuous rated current of 32A, after considering the de-rating factors, as applicable. • Other components for completion of job as per specifications and drawings Erection/Installation: • Laying, erection, testing & commission of viaduct sockets & associated cables and fittings in complete Testing & Commissioning: • Testing and commission.
A.4	Inverter Supply and erection including testing and commissioning of 1 MW inverter set in TSS, complete	Supply:- • 02 No. Inverter set with all necessary accessories • Protection relays as per specification • Current and voltage sensors device for measurement and protection • Castle Locks, Fittings & other components for completion of Job as per specifications and drawings • Floor insulation mats of appropriate voltage rating for placement of DC equipments. • Protections & Interlocks. Erection/Installation: • Erection of all above equipment Testing & Commissioning

SN	Title of Specification	Specification No.
4.	Code of Practice for installation and maintenance of Power Cables up to and including 33kV rating.	BIS: 1255 latest
5.	HDPE pipes	BIS: 4984 latest
6.	Impulse test on cables & their accessories.	IEC 60230 latest
7.	Cyclic and emergency rating of cable	IEC 60852-2 latest
8.	Common test methods for insulating and sheathing material of electrical cables.	IEC 60811 latest
9.	Electric test methods for Electric cables – Test methods for Partial Discharge measurements on lengths of extruded power cables.	IEC 60885- Part 3 latest
10.	XLPE insulated PVC sheathed cables for working voltages up to 220 kV	IS 7098 Part-II
11.	Tests on electric cable under fire conditions	IEC 60332 Part 1 and Part 3 (latest)
12.	Tests on electric cables (Limited Oxygen Index and Temperature Index of 260 °C)	ASTM D 2863
13.	Measuring of smoke density of cables burning under defined conditions	IEC 61034 BS 7622 ASTM D 2843
14.	Method of determination of amount of Halogen acid gas evolved during combustion	IEC 60754 – Part 1 and 2

13.2.3 RATINGS

13.2.3.1 The cables shall be designed for the expected rating and other parameters indicated in Table 13.2:

Table 13.2: 33kV Cable Rating

SN	Description	33kV Cable Rating
1.	Type	Dry insulated, radial field
2.	Conductor cross section	300mm ² & 120 mm ²
3.	Conductor material	Aluminium
4.	No. of cores	1
5.	Fire Retardant Property (Conforming to UTE Standard 32 700, test N°2, IEC 60502-1 or equivalent)	FRLS for elevated, at-grade sections & depots FRLSOH for UG stations
6.	Rated voltage	U0/U (Um) = 19 / 33 (36) kV (Suitable for use in 33kV earthed system)
7.	Maximum Voltage	36 KV
8.	Neutral	Earthed through NGR of 19 ohm
9.	Frequency	50 Hz
10.	Short circuit current carrying capacity of conductor	16 kA for 3 sec (for 300 mm ²) 6.5 kA for 3 sec (for 120 mm ²)
11.	Short circuit current carrying capacity of metallic screen	1 kA for 3 sec
12.	Permissible Frequency variation	± 3%
13.	Rated short circuit duration power	70 kV rms

shall be drilled by one hole. The anchor blocks shall be firmly fitted onto the conductor rail by mean of Huckbolts. The anchorage shall be capable of withstanding an 'along track' load of 2 kN minimum without failure.

- 16.2.4.6.4 Assemblies of lengths of rails are retained in position and prevented from moving longitudinally by the use of rail anchors. Normally these anchors shall be located at the mid-point of rail lengths, between expansion joints, but there may be occasions when anchors are needed at other places, for example near cable terminals (typically 22.5m from cable terminal).
- 16.2.4.6.5 The anchor must be strong enough to withstand all the likely forces from normal expansion and contraction of the rails in service. In the event of overload, for instance from a seized expansion joint or insulator, the anchor shall be designed to move and ease the load in the rail.
- 16.2.4.6.6 Anchors shall be designed to locate against a support bracket so that if overload occurs, the bracket may deflect and indicate the fault.
- 16.2.4.6.7 Tests shall be carried out on the mechanical ~~and electrical~~ properties to prove the quality of the arrangement. The Contractor/supplier shall submit respective test programs.
- 16.2.4.6.8 The Contractor shall submit design calculations required to identify locations for the midpoint anchor placement to ensure proper thermal movements. The type of design shall be easy to install, offers a positive lock on the rail, and to be easily adjusted to any point on the system. Special care shall be taken to identify for midpoint anchor placement to ensure the proper thermal movements. The movements shall be calculated and to be made available, along with graphical presentation for approval of the Employer.

16.2.4.7 **Power Feed Assembly**

- 16.2.4.7.1 The Power Feed Assembly consists of cable terminals that are arranged on the conductor rail located in accordance with the plans of the traction power supply. At intervals along the conductor rails, it is necessary to connect cables, particularly near ramps and at substation feeding points. It shall be the responsibility of the Contractor to lay and connect the cables connections at all such places.
- 16.2.4.7.2 Feeding points shall consist of two aluminium blocks and associated Huckbolts, firmly connected to the third rail. One aluminium block is the same as used for splice joints and the other one has a specific extrusion plate that is dedicated for cable lug fastening. It should be possible to arrange the plate in shape, which suits the incoming cable lugs. Power Feed Plate must be a single aluminium profile, welding must be avoided.
- 16.2.4.7.3 The entire assembly shall be able to withstand the effect of vibration leading to fatigue and loosening and be suitable to carry the current without undue resistance or temperature rise. The calculations for deflection due to power feed terminals shall be submitted by the Contractor.
- 16.2.4.7.4 All feeding points shall be pre-drilled having no direction restrictions to facilitate onsite installation. For installing the feed assembly, drilling on the conductor rail shall be done

Table 14.10: 33 kV/415 V Auxiliary Transformer Rating & GTP

S.NO	Description	500 kVA	2000 kVA
1.	Type	3-Φ Dry Type for indoor installation	3-Φ Dry Type for indoor installation
2.	Relevant Specification	IEC 60076, IS 2026, ~~IS 2026-11~~ ~~IS 11171~~	IEC 60076, IS 2026, ~~IS 2026-11~~ ~~IS 11171~~
3.	Insulation type	Cast resin	Cast resin
4.	Configuration/vector group	Dyn11	Dyn11
5.	Primary rated highest voltage	36 kV	36 kV
6.	Primary operating voltage	33 kV	33 kV
7.	Secondary rated voltage	415 V/230 V	415 V/230 V
8.	Secondary system highest voltage	460 V	460 V
9.	Rated short duration power frequency withstand voltage for primary winding	70 kV	70 kV
10.	Rated lightning impulse withstand voltage for primary winding	170 kV	170 kV
11.	Rated short duration power frequency withstand voltage for secondary winding	3 kV	3 kV
12.	Duty	Continuous	Continuous
13.	Winding material	Aluminium	Aluminium
14.	Secondary Voltage at off load with 33 kV primary	415 V	415 V
15.	Secondary Voltage at full load & PF 0.8 lag	390 V	390 V
16.	Insulation rated voltage (primary side)	36 kV	36 kV
17.	Power frequency withstand level	70 kV	70 kV
18.	Surge withstand voltage (BIL)	170 kV	170 kV
19.	Short circuit rating for primary side (at all tapping)	25kA for 3 seconds	25kA for 3 seconds
20.	Short circuit rating for secondary side (at all tapping)	As per IEC 60076-5	As per IEC 60076-5
21.	Secondary Neutral earthing	Solidly earthed	Solidly earthed
22.	Class of insulation	HV :- F LV :- H	HV :- F LV :- H
23.	Cooling	AN	AN
24.	Tap changer	Off load	Off load
25.	Tap positions	-5%, -2.5%, 0, 2.5%, 5%	-5%, -2.5%, 0, 2.5%, 5%
26.	Overload rating	As per IEC 60076-12	As per IEC 60076-12
27.	% age impedance	4%	6.25%

Annexure 9

LKE (02)-01: Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main Sub Stations Including 750 volts DC 3rd Rail Traction System, 33kV Cable Network, ASS, TSS & SCADA System for East West Corridor (Phase 1 B) of Lucknow Metro Rail Project at Lucknow, Uttar Pradesh, India.

FORM OF TENDER – APPENDIX-1

[REQUIREMENTS UNDER GENERAL CONDITIONS OF CONTRACT]

S.No.	DESCRIPTION	REF. TO CLAUSE NO.	REQUIREMENT
i	Amount of Performance Security	Clause 4.2 of the GCC	10% of the Contract Price in types and proportions of currencies in which the contract price is payable. In the event of variations during the execution of the contract which result in payments to the Contractor over and above the contract price, the Performance Security shall be suitably adjusted.
ii	Latest 'date for commencement' of the Works	Clause 8.1 of the GCC	Date given in LOA or Employer's Notice to Proceed
iii	'Time for completion' of the work from the date of commencement of the work	Clause 8.2 of the GCC	As given in key details of NIT
iv	Liquidated Damages	Clause 8.5 of the GCC	As per the referred clauses of GCC
v	'Defects Liability Period' for the whole of the Works	Clause 10 of the GCC	As per clause 6 of SCC after the date of issue of Taking-Over Certificate for whole of the works
vi	Amount of advance payment	Clause 11.2 of the GCC	As per clause No. 8 and 9 of SCC
vii	Amount of Professional Indemnity Insurance (PII)	Clause 15.1 and 15.5 of the GCC	<u>AOA (any one accident) limit equal to 6%</u> of the contract value against BOQ in respect of "design and construct" with AOY (any one year) limit of 2 incidents in a year . In the Professional Indemnity insurance Policy the deductible amount shall not be more than 5% of AOA limit. PII Policy shall be obtained within four weeks from „date of commencement" and shall be valid for five years after date of issue of 'Performance Certificate'. Wherever the contractor submits policy for shorter period /annual renewable policy, the same shall be renewed before its expiry date. In such situation, the performance guarantee (5% of contract value) shall be retained till required validity period. The

Sl. No	Station/ Equipment Name (From)	Station/ Equipment Name (To)	Section Location (Elevated/At Grade/UG)	Type (FRLS/ FRLSOH)	Total Runs & 33kV AC RSS/Depot/ Ring Cable Size
					3R#1Cx300sq.mm
East West Corridor Cable sections from RSS/AMS to Stations					
12.	Vasantkunj RSS/ AMS	Vasantkunj	At-grade/ Elevated	FRLS	Double Circuit 036R#1Cx300sq.mm
East West Corridor Cable sections from RSS to Depot ASS+TSS					
13.	Vasantkunj RSS	Vasantkunj Depot ASS+TSS	At-grade/ Elevated	FRLS	Double Circuit 036R#1Cx300sq.mm

SN	Description	33kV Cable Rating
	frequency withstand voltage	
14.	Rated lightning impulse withstand voltage	170 kV Peak

13.2.3.2 Environmental and Climatic Data

- The environmental and climatic data in Lucknow are provided in General Specifications.
- The thermal resistivity of soil may be assumed to be 120-150⁰ C-cm/Watt (For laying in ground from RSS/AMS to Depot ASS+TSS & from RSS/AMS to ASS/TSS). The Contractor shall furnish the current rating of 300 mm² Aluminium cable at assumed thermal resistivity of soil. However, the Contractor has to measure the soil thermal resistivity along the cable route and the cable has to be designed suitably.
- It should be noted that environmental conditions will be very severe during construction; these conditions shall not be the cause of any alteration of equipment or material whether already installed or simply stored.

13.2.3.3 General Requirements

- 13.2.3.3.1 The Contractor shall confirm the section of these cables as regard to the route installation, the thermal conditions in service, the climatic conditions, the energy and currents flowing through these cables, taking into account the worst electrical conditions i.e. operation under permissible overload conditions. and operation when Vasantkunj RSS of a corridor is out of service.

- 13.2.3.4 The 33kV cables shall be used at different locations. The minimum cable size requirement for different sections is indicated in Table 13.3. & Annexure-I

Table 13.3: 33kV Cable Sizing[#]

SN	Location	Cable Size (for each circuit)
1.	From 33 kV RSS outgoing bay to 33 kV Depot ASS+TSS incoming CB	2x[3 x (1C x 300 mm ²)] Aluminium Conductor FRLS cable for Vasantkunj RSS/AMS
2.	From 33kV CB in RSS/AMS to ASS or ASS+TSS	2x[3 x (1C x 300 mm ²)] Aluminium Conductor FRLS cable for Vasantkunj RSS/AMS
3.	From 33kV CB Charbagh(Elev) to 33kV CB, Charbagh(UG)	2x[3 x (1C x 300 mm ²)] Aluminium Conductor FRLS cable
4.	33kV loop-in-loop-out for Ring main cables	[3 x (1C x 300 mm ²)] Aluminium Conductor FRLS cable for Ring Main Loops [3 x (1C x 300 mm ²)] Aluminium Conductor FRLSOH cable for Ring Main Loops. (FLRS Cable for Elevated/at grade stations and FRLSOH Cable for Underground section)
5.	33kV CB to Auxiliary Transformer	[3 x (1C x 120 mm ²)] Aluminium Conductor, FRLS for elevated / at-grade section and Depot

Annexure 12

form. Monthly Cash Flows for the Contract will form part of the Pricing Document.

- b. The MPS covers the period, which will commence on the first day of the calendar month next after the month containing the Commencement Date of the Works as per the Contract. The first application for interim payment may be made not earlier than during the month following the calendar month next after the month containing the Commencement Date of the Works, such first application relating to the first month (i.e., month 1) of the MPS.
- c. The price shall not be unbalanced therefore, the price quoted in the Design (Bill No. 12.1) shall not be more than 2% AND Erection/~~Installation and~~, Testing and Commissioning (~~ETC~~) shall not be less than ~~25% 15% and 10% respectively~~, of the price quoted in the Price of Supply.

5. Tender Total

- a. The Tender Total submitted by the Tenderer shall be in the format shown in the Pricing Document.
- b. The Pricing Document contains Bills, Milestone activity under each bill. The Bills and Milestones activity have been prepared to indicate the extent of detail required in the Tender. The Tenderer shall prepare and complete documents, in this format, as being his Tender and submit as part of the Financial Package.
- c. The Pricing Document completed and submitted by the Tenderer, as part of his Tender, should use an indexing and page numbering system such that its extent and completeness is clearly evident.

6. Currency

Bill Totals and Milestone amounts shall be indicated in Indian Rupees and in a Foreign Currency as per clause C16.1 of ITT to Tenderer (Vol.1), wherever required.

7. Milestones

- a. Bills are fixed and shall not be changed by the Tenderer. The Bill represents the major items of the Works for which the Employer will pay the Contractor, and the Tenderer shall ensure that he has allowed for all his costs he requires for the Contract to meet the Employer's Requirements.
- b. If during the course of execution, it becomes necessary, to meet the Employer's Requirements (as indicated in these Tender Documents), to add more Milestones in a Bill, the Lump Sum Price of the whole of Works, which will remain unaltered, will be reapportioned amongst the Bills, and further redistributed under the Bill and the Milestones in each Bill. The liability of the Employer will be limited to the fixed Lump sum Price already accepted and the Contractor will have no right to claim any thing over and above the fixed Lump Sum price for any such addition of Milestones in any Bill. The decision of the Employer will be final and binding in such matters and will not be subject to Conciliation or Arbitration.
- c. The Milestones represent the completion of verifiable activities to be undertaken by the Contractor. A date for the achievement of each Milestone expressed as a number of weeks from the Commencement Date of the Works shall be entered in the column provided. Milestones that lead to achievement of a Stage must always precede the Key Date for achievement of that Stage. Milestones shall be converted to Calendar dates when the Notice to Proceed is issued.
- d. Activities against which no price is entered by the tenderer shall be regarded as covered by other price in the Milestone.

- 14.2.17.4.1 All live conductors shall be inside SF6 gas insulating medium ~~/Hybrid model~~ of full GIS. The Contractor shall submit details on quantity, quality and density of SF6 gas to be used in the switchgear in accordance with IEC 60376.
- 14.2.17.4.2 The GIS shall be grouped into suitable gas compartments with each compartment fitted with a monitoring pressure gauge/sensors and a pressure relief device.
- 14.2.17.4.3 The gas leakage rate shall be guaranteed to be less than 0.1% of gas mass in the tank over a period of One Year.
- 14.2.17.4.4 The GIS shall be so designed that an internal arc fault in a compartment will not affect other gas compartments, and compartments for operating mechanism and protection relays. The high pressure gas or air from the GIS during an internal arc fault shall be directed or vented to a direction away from the operator. The Contractor shall provide type test reports for the internal arc test.
- 14.2.17.4.5 SF6 Gas apparatus warning sign shall be provided on the GIS. Dual alarm for gas pressure low to be provided and after second stage alarm CB shall trip and lock.
- 14.2.17.5 Switchgear Interlocking
- 14.2.17.5.1 Where a circuit breaker or other switchgear is fitted with means for mechanical or electrical operation, interlocks shall be provided so that it is impossible for the electrical and mechanical devices to operate simultaneously.
- 14.2.17.5.2 An electrical or a mechanical key interlocking system shall be provided whereby it is not possible to apply an earth to a section of the busbar until all circuit breakers which can feed that section are locked open.
- 14.2.17.5.3 The earthing devices shall be provided with interlocks to ensure correct operation in conjunction with the associated circuit breaker.
- 14.2.17.5.4 The isolators and the associated circuit breaker which are integral parts of the switchboard shall be equipped with mechanical interlocking to ensure that the isolators cannot be operated unless the associated CB is opened. For the same reason, motorised isolator shall be installed with electrical interlock to provide the same interlocking logic.
- 14.2.17.5.5 Means shall be provided whereby the electrical tripping of the circuit breaker is rendered inoperative during earthing operations both when closing and when closed in the earthed position. It shall not be possible to return to the service position and close the circuit breaker until the electrical tripping is again operative.
- 14.2.17.5.6 Where interlocking over a distance is required, two independent criteria shall be used, e.g. absence of a voltage and remote feeding circuit breaker open. Indication of the remote condition shall be by single purpose circuit, care being taken that the conductors used are adequately screened and shielded to minimise both transverse and longitudinal voltages resulting e.g. from electromagnetic induction, differences in earth potential or other causes. The Contractor shall ensure that voltages dangerous to personnel or deleterious to correct operation shall not arise.
- 14.2.17.5.7 When there is provision for isolation of sections of cable between two “either-or” interlocked circuit breakers, a key-operated over-ride shall be provided to permit both circuit breakers to be closed at the same time provided that the circuit between them is broken. It shall not be possible to restore the connection without tripping one of the two circuit breakers and releasing the key.
- 14.2.17.5.8 The mechanical closing button of circuit breaker shall be interlocked with the closing conditions of the circuit breaker such that operation of the mechanical closing button shall be prohibited if the closing conditions of the circuit breaker are not fulfilled.

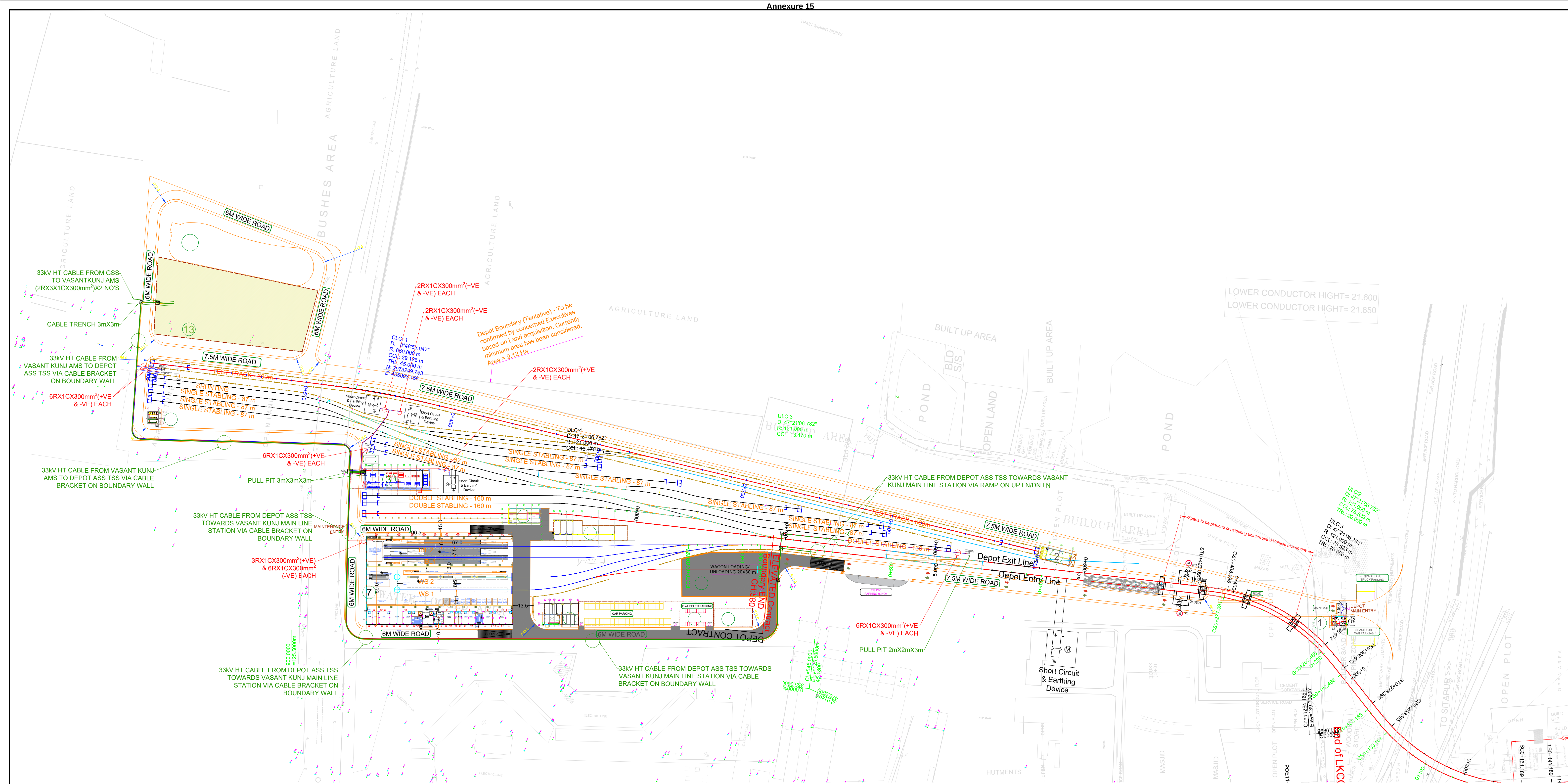
SN	Description	33 kV Vacuum Circuit Breaker
20	Potential transformer accuracy class	Shall be in accordance with SLD/Relevant Tender Drawings.
21	Earthing isolator making capacity	25kA for 3 sec
22	Rated short time duration power frequency withstand voltage	70 kV rms
23	Rated short time duration impulse withstand voltage	170 kV peak
24	Auxiliary supply ac voltage	230 V, 1 phase, 50 Hz

Table 14.4: 33 kV Incomer Rating at RSS AMS

SN	Description	33 kV Switchgear
1.	Type	Draw out Indoor type Vacuum Circuit Breaker
2.	Rated Service Voltage	33 Kv
3.	Insulation level (minimum)	36 kV
4.	No. of poles/phases	Three
5.	Rated Frequency	50 Hz
6.	Rated normal current	~~4000~~ 1250A As per Tender SLD
7.	Busbar current rating	~~4000~~ 1250A As per Tender SLD
8.	Allowable overcurrent for 3 sec	25kA
9.	Instantaneous overcurrent	62.5kA Peak
10.	Rated short circuit withstand capacity	25kA for 3 Sec
11.	Auxiliary DC supply voltage	110 V dc
12.	Allowable variation range of control supply voltage	+10%, -15%
13.	Protection Degree	IP ~~5X~~ 3X
14.	Current transformer accuracy class	Shall be in accordance with SLD/Relevant Tender Drawings.
15.	Potential transformer accuracy class	Shall be in accordance with SLD/Relevant Tender Drawings.
16.	Earthing isolator making capacity	25kA for 3 sec
17.	Rated short time duration power frequency withstand voltage	70 kV rms
18.	Rated short time duration impulse withstand voltage	170 kV peak
19.	Auxiliary supply ac voltage	230 V, 1 phase, 50 Hz
20.	CB Opening time	<60ms
21.	CB Breaking time	<80ms
22.	CB Closing time	<80ms
23.	Rated operating duty	O-0.3sec-CO-3min-CO
24.	Total arc interruption duration	Less than 3 cycle
25.	Number of mechanical operations	10,000 operating sequences

Annexure 15

Additional Tender Drawings	
S.No.	DRAWING TITLE
1	Cable Route Drawing in Depot
2	SCADA Architecture centralised OCC
3	Overall Depot Architecture Drawing
4	Typical Viaduct Light Diagram
5	Typical Single Line Diagram Drawing of ASS/TSS (UG) with RSS Incomer- Type D
6	Typical Single Line Diagram Drawing of ASS (UG)- Type E
7	Typical Single Line Diagram Drawing of ASS/TSS (UG)- Type F
8	Typical ASS/TSS Single Line Diagram with Inverter (UG)- Type H
9	SCADA Architecture NS corridor
10	Munshipulia RSS SAS Communication Connectivity Diagram
11	Transport Nagar RSS SAS Communication Connectivity Diagram
12	Overall communication NS corridor



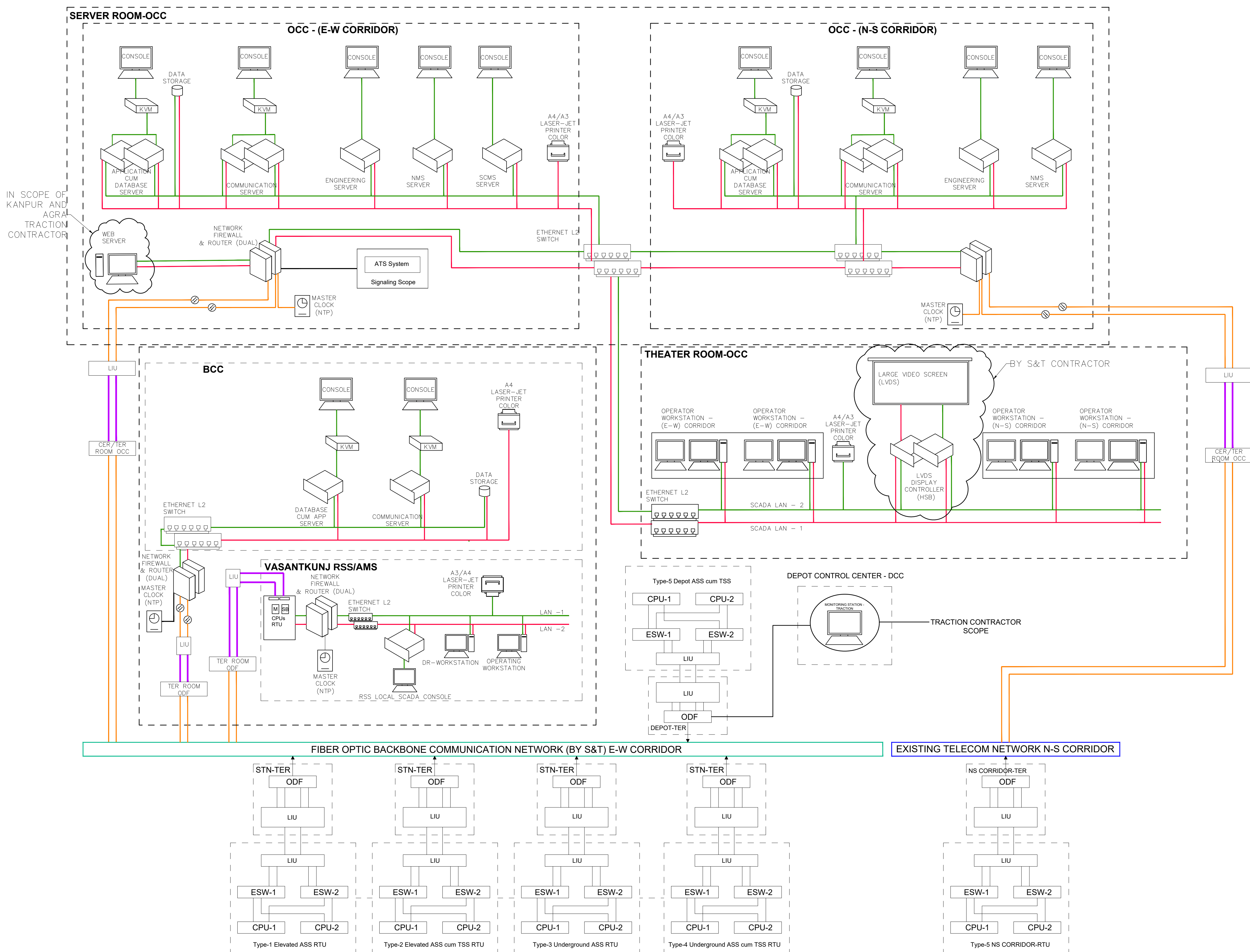
01 DEPOT CABLE ROUTING

Scale - 1:1250

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	REFERENCE DRAWINGS																		TRACTION POWER							
	REVISION	DESCRIPTION		DRAWING NO.																DRAWING TITLE:						
																				DEPOT CABLE ROUTING						
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OVERALL SCADA ARCHITECTURE



NOTES:

1. The communication equipment and communication cable interconnections are indicative. This may change as per specific site requirements.
2. The port quantity mentioned for ESW, Firewall router and other components are indicative. This may be change as per requirements of the project.
3. Master clock (NTP) is in the scope of S&T.
4. Connection of ATS System in Traction Network is established for evacuation or emergency condition.
5. This drawing to be read in conjunction with SCADA Technical Specifications Chapter 18 (i) & 18 (ii) and Chapter-3; Interface with S&T.
6. This drawing is indicative and applicable to LKE(02) - 01 and Upgradation of existing SCADA System.
7. An Integrated OCC to be designed as per Technical specifications to cater the New and Existing SCADA system with Separate SCADA Server system as indicated in this drawing.
8. This is a typical SCADA system architecture. Identical system architecture needs to be developed and upgraded for existing SCADA system in conjunction with SCADA Technical Specifications Chapter - 18 (ii) requirements.
9. SCADA communication for existing N-S corridor including existing both RSS and existing BCC shall be integrate with new OCC building using Telecom network of N-S corridor and inter-connect with E-W corridor at OCC.
10. Contractor has to interface with telecom contractor for communication network between station/depot/RSS to new OCC building.
11. Contractor has to do necessary interface with S&T contractor for ATS SCADA interface.
12. For integration of the SCADA (Supervisory Control and Data Acquisition) system at the OCC (Operations Control Center) and BCC (Backup Control Centre) with RTUs (Remote Terminal Units) installed at various substations along the E-W corridor, the required optical fiber communication backbone shall be provided by the Signaling & Telecommunications (S&T) Contractor. The S&T Contractor shall provide dedicated (dark) optical fiber cores in both the Up (UP) track and Down (DN) track fiber-optic backbone cables exclusively for SCADA communication FOR E-W Corridor. The Telecom Contractor shall provide a redundant dual direct communication link, each having a bandwidth of 1 GBPS, interconnecting the OCC and BCC.
13. SCADA system shall support multi-protocol i.e IEC 60870-5-101 & 104, IEC-61850 and OPC DA/UA protocol.

LEGEND

- ETHERNET CABLE
— UNARMoured FO CABLE
— ARMoured FO CABLE

GENERAL NOTES:

1. THIS DRAWING IS ONLY FOR TENDER PURPOSE AND IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO DEVELOP DETAILED DESIGN AND OBTAIN APPROVAL OF THE ENGINEER.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECHNICAL SPECIFICATIONS, OTHER TENDER DRAWING AND OTHER PARTS OF TENDER DOCUMENTS, AS RELEVANT.

REFERENCE DRAWINGS

REVISION	DESCRIPTION	DRAWING NO.

REVISIONS

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED. BY
R4	REVISED AS PER CUSTOMER COMMENTS	19-06-2026	VJ	SA
R3	REVISED AS PER CUSTOMER COMMENTS	29-05-2026	DM	SA
R2	AS PER CLIENT'S REQUIREMENT	24-05-2026	DM	SA
R1	SECOND ISSUE	15-05-2026	DM	SA
R0	FIRST ISSUE	11-05-2026	DM	SA

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Architecture Design In-charge/ Coordinator	Structure Design In-charge/ Coordinator	E&M Design In-charge/ Coordinator
DETAIL DESIGN CONSULTANT :		



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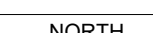


UTTAR PRADESH METRO RAIL CORPORATION LTD
(Formerly known as Lucknow Metro Rail Corporation Ltd.)
Administrative Building, Near Dr. Bhimrao Ambedkar Samajik Parivartan Sthal,
Vipin Khand, Gomti Nagar, Lucknow-226010

PROJECT: Contract LKDDC-02: Engagement of Detailed Design Consultant (DDC) for Civil, Architectural, E&M and Traction Works for the design of 4.29 Km (including ramp) elevated section with 05 elevated Stations, & 6.88 Km (including ramp) underground section with 07 underground Stations One Car Maintenance Depot and stabling lines at Vasantkunj, Lucknow

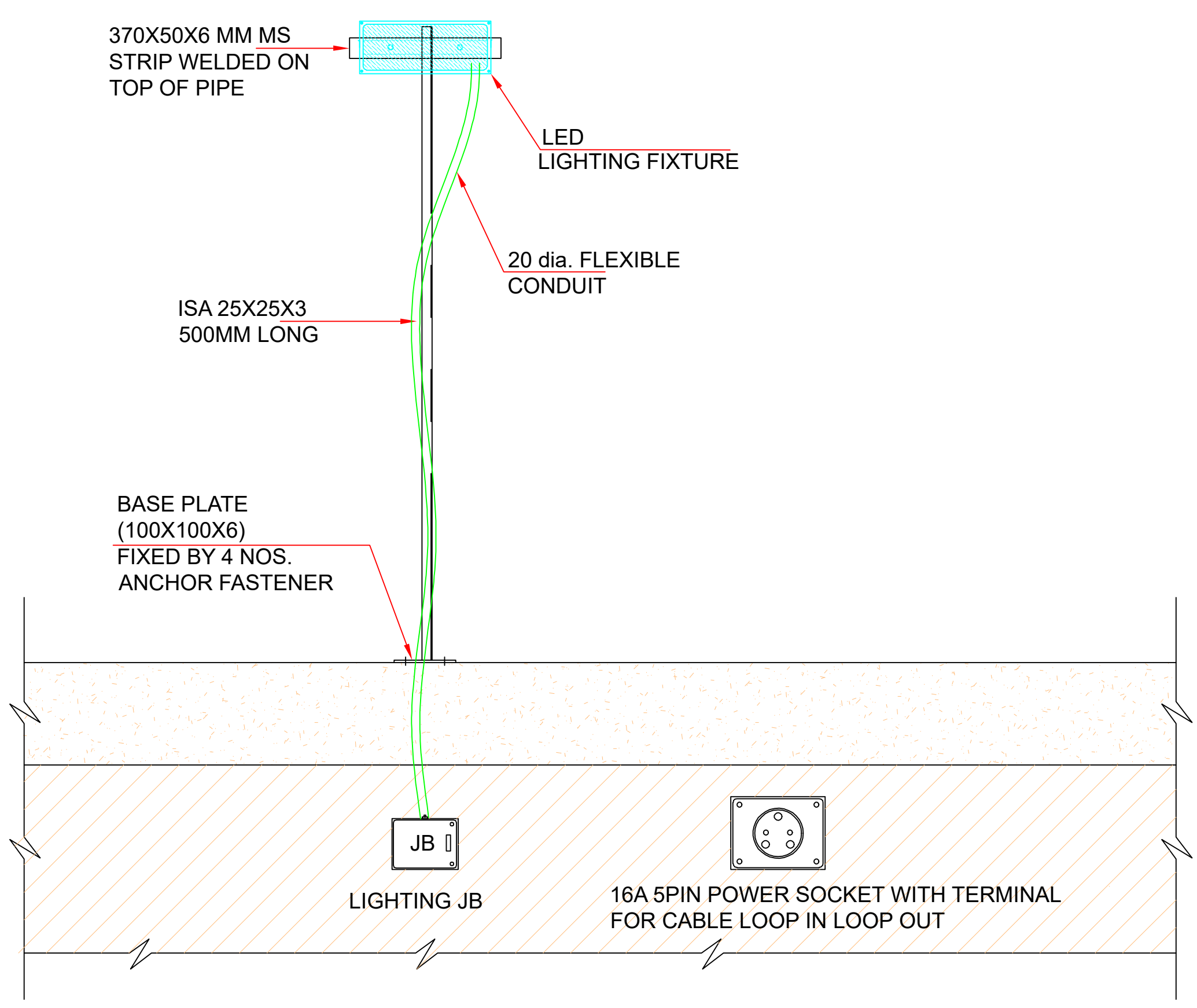
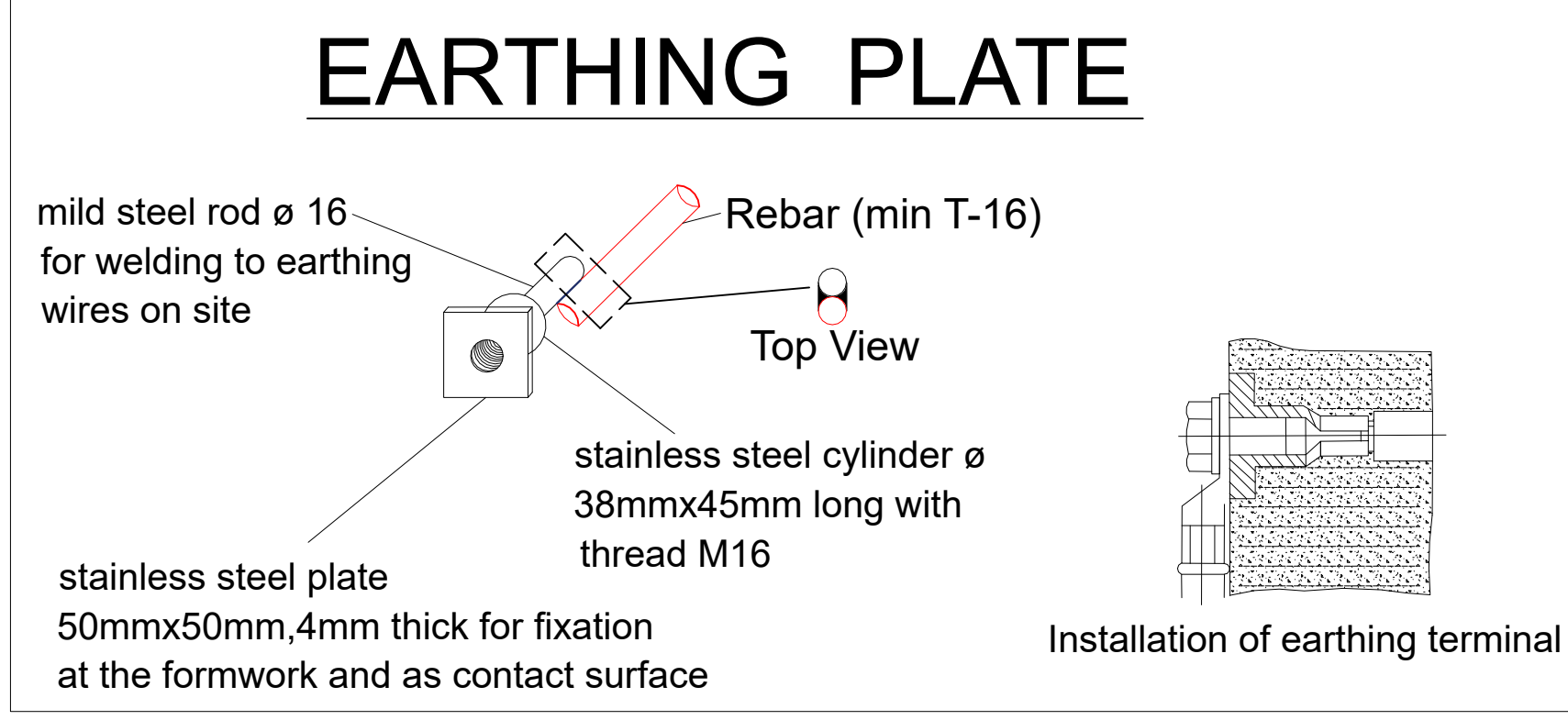
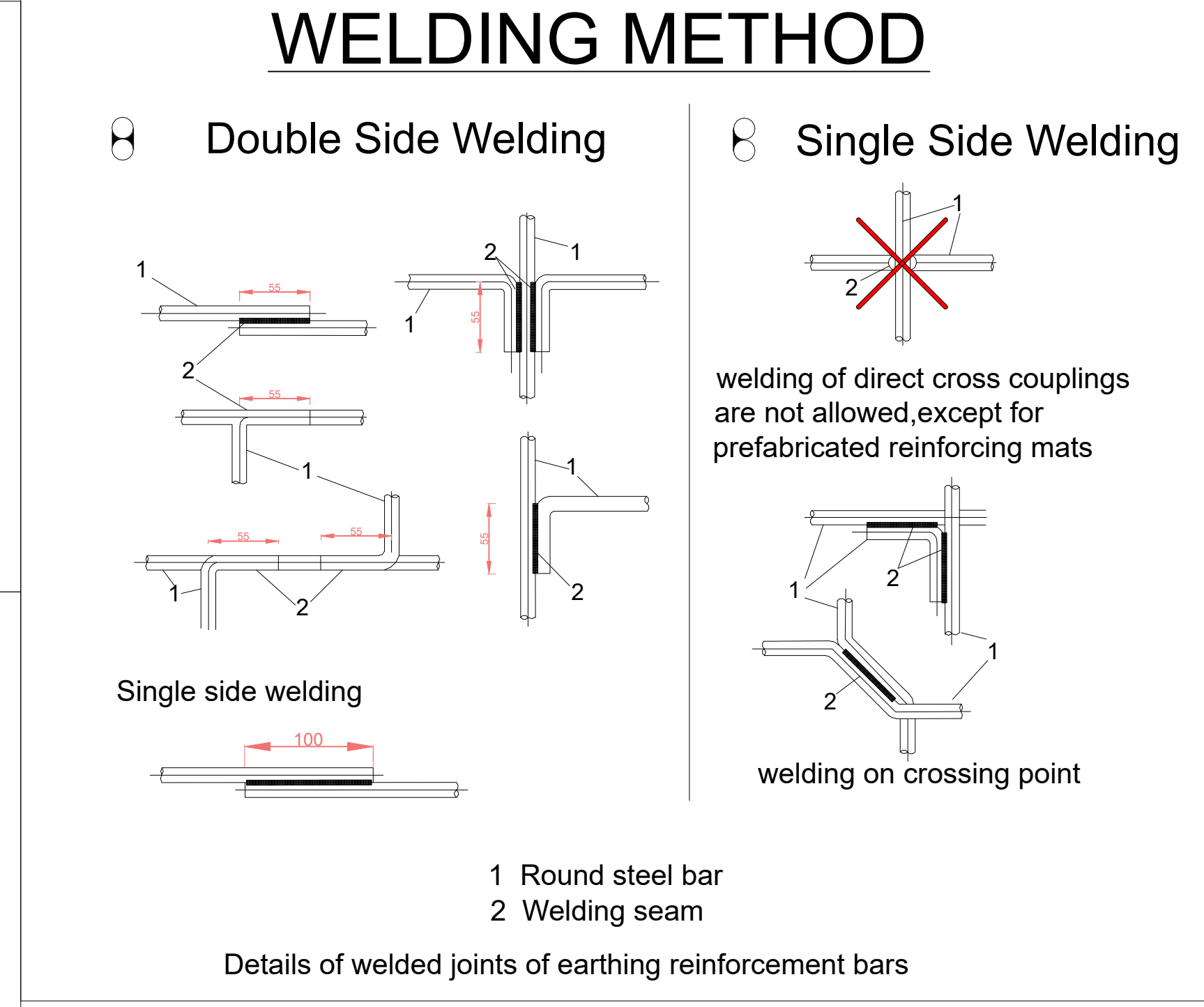
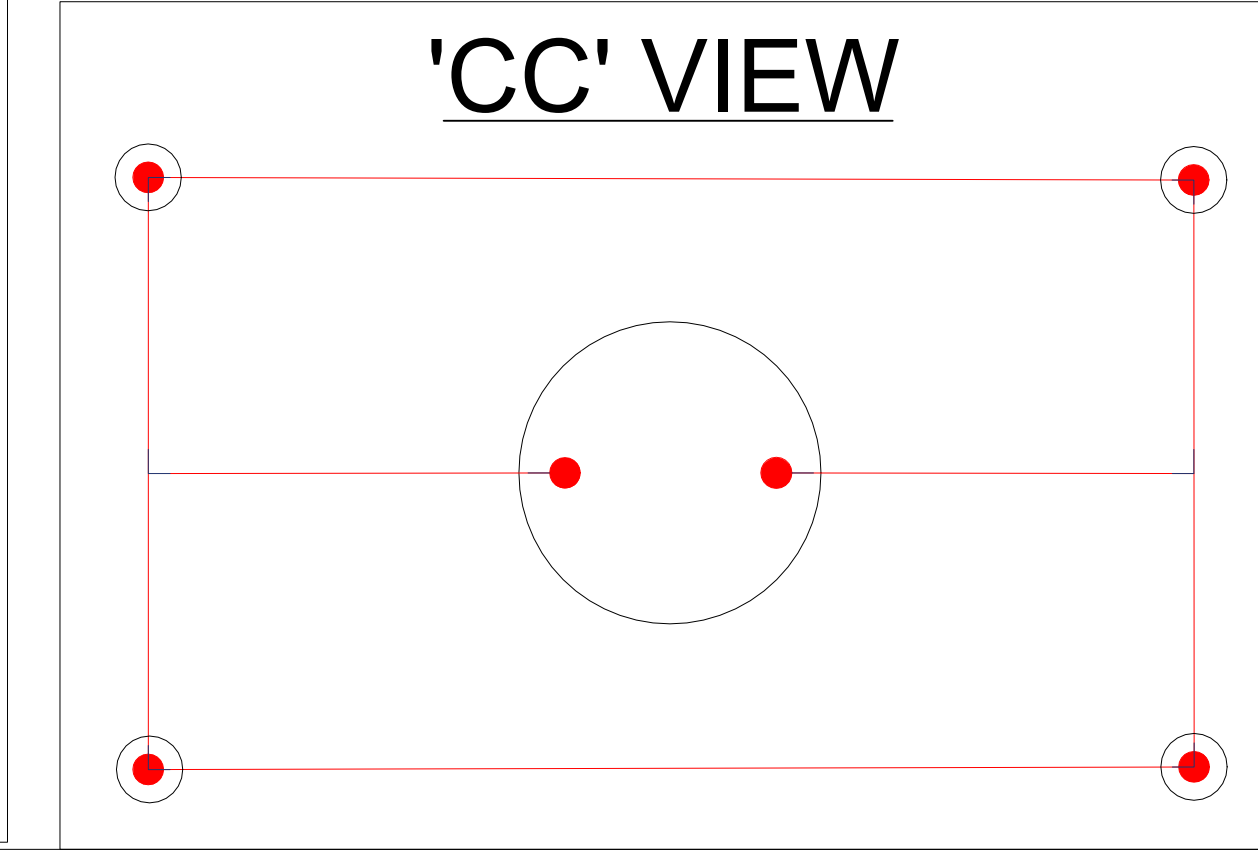
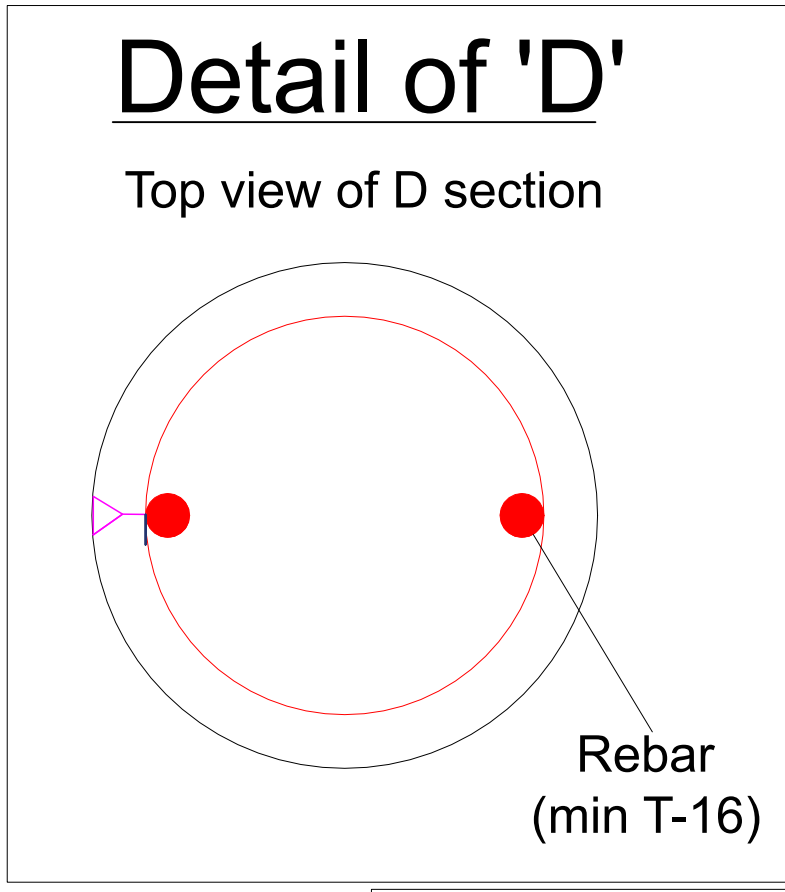
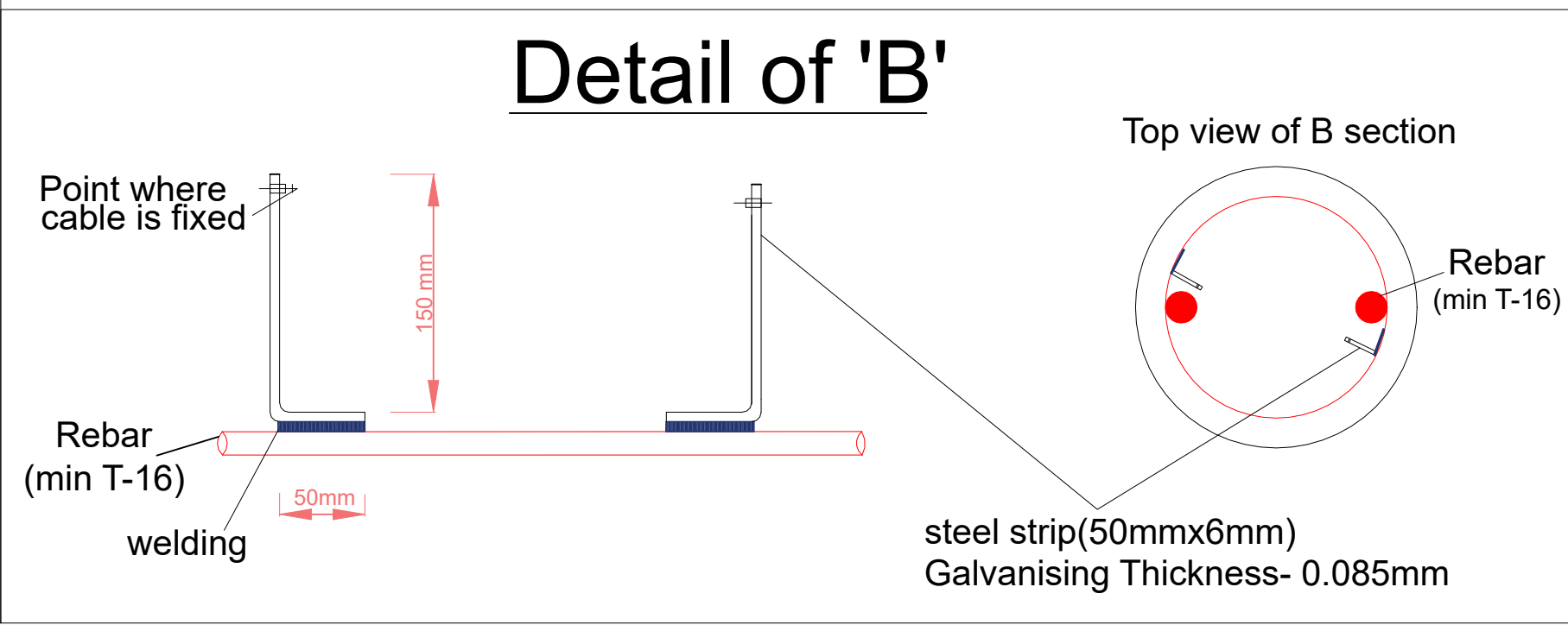
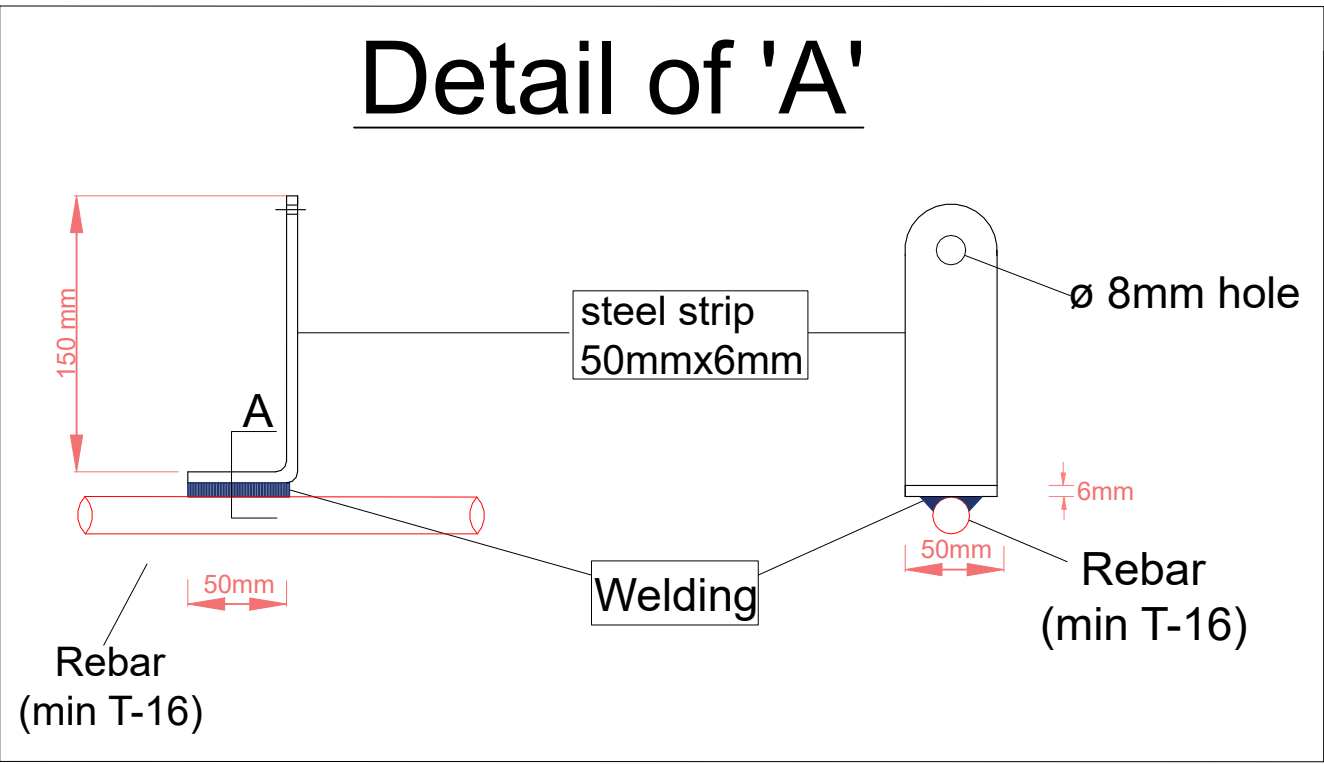
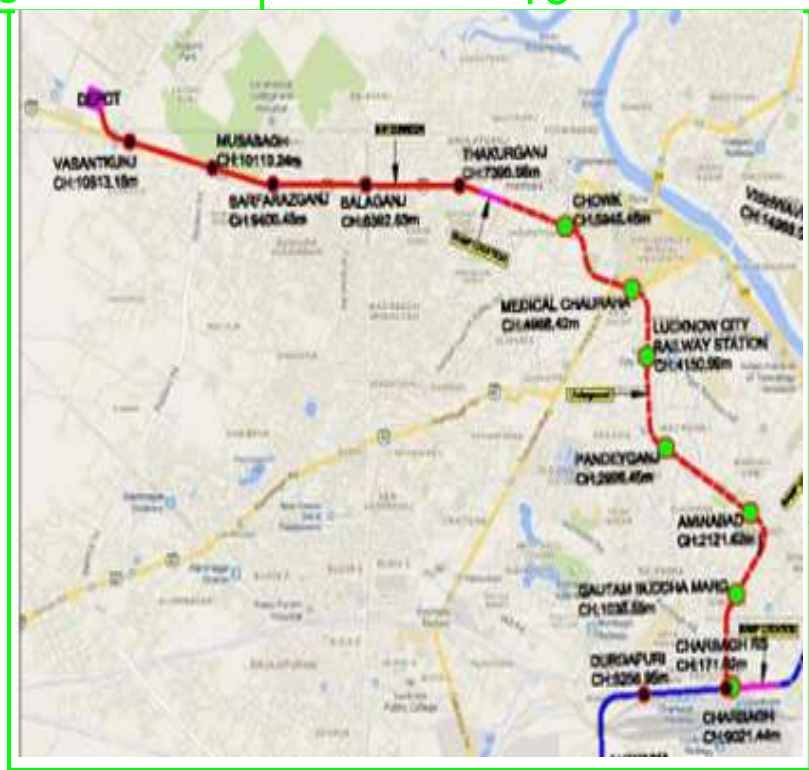
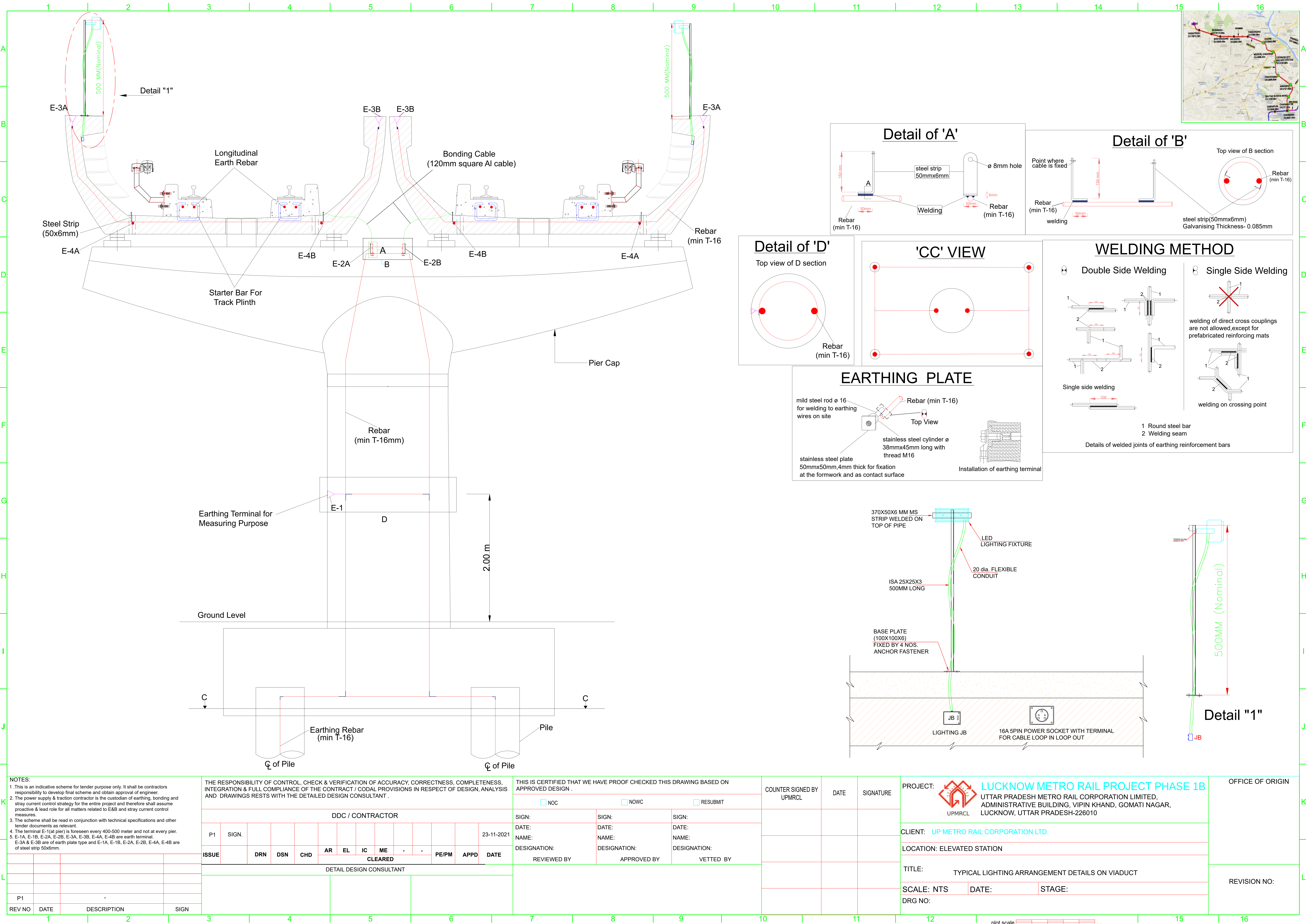
TRACTION POWER

SCADA System Architecture - OCC/BCC

	DRAWN BY: DM	CHECKED BY: SA	VERIFIED BY: RP	APPROVED BY: NG	LKDD-C-02
	DATE: 19-06-2026	REV: R4	SCALE: NTS	STATUS: PRD	
	DRAWING NUMBER: LKDDC02-TRD-GEN-PST-DWG-38150		SHEET NO. 01 OF 01	SHEET SIZE A1	

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NOTES:

- This is an indicative scheme for tender purpose only. It shall be contractors responsibility to develop final scheme and obtain approval of engineer.
- The power supply & traction contractor is the custodian of earthing, bonding and stray current control strategy for the entire project and therefore shall assume proactive & lead role for all matters related to E&B and stray current control measures.
- The scheme shall be read in conjunction with technical specifications and other tender documents as relevant.
- The terminal E-1(at pier) is foreseen every 400-500 meter and not at every pier.
- E-1A, E-1B, E-2A, E-2B, E-3A, E-3B, E-4A, E-4B are earth terminal. E-3A & E-3B are of earth plate type and E-1A, E-1B, E-2A, E-2B, E-4A, E-4B are of steel strip 50x6mm.

THE RESPONSIBILITY OF CONTROL, CHECK & VERIFICATION OF ACCURACY, CORRECTNESS, COMPLETENESS, INTEGRATION & FULL COMPLIANCE OF THE CONTRACT / CODAL PROVISIONS IN RESPECT OF DESIGN, ANALYSIS AND DRAWINGS RESTS WITH THE DETAILED DESIGN CONSULTANT.													
DDC / CONTRACTOR													
P1	SIGN.												23-11-2021
ISSUE		DRN	DSN	CHD	AR	EL	IC	ME	-	-	PE/PM	APPD	DATE
CLEARED													
DETAIL DESIGN CONSULTANT													

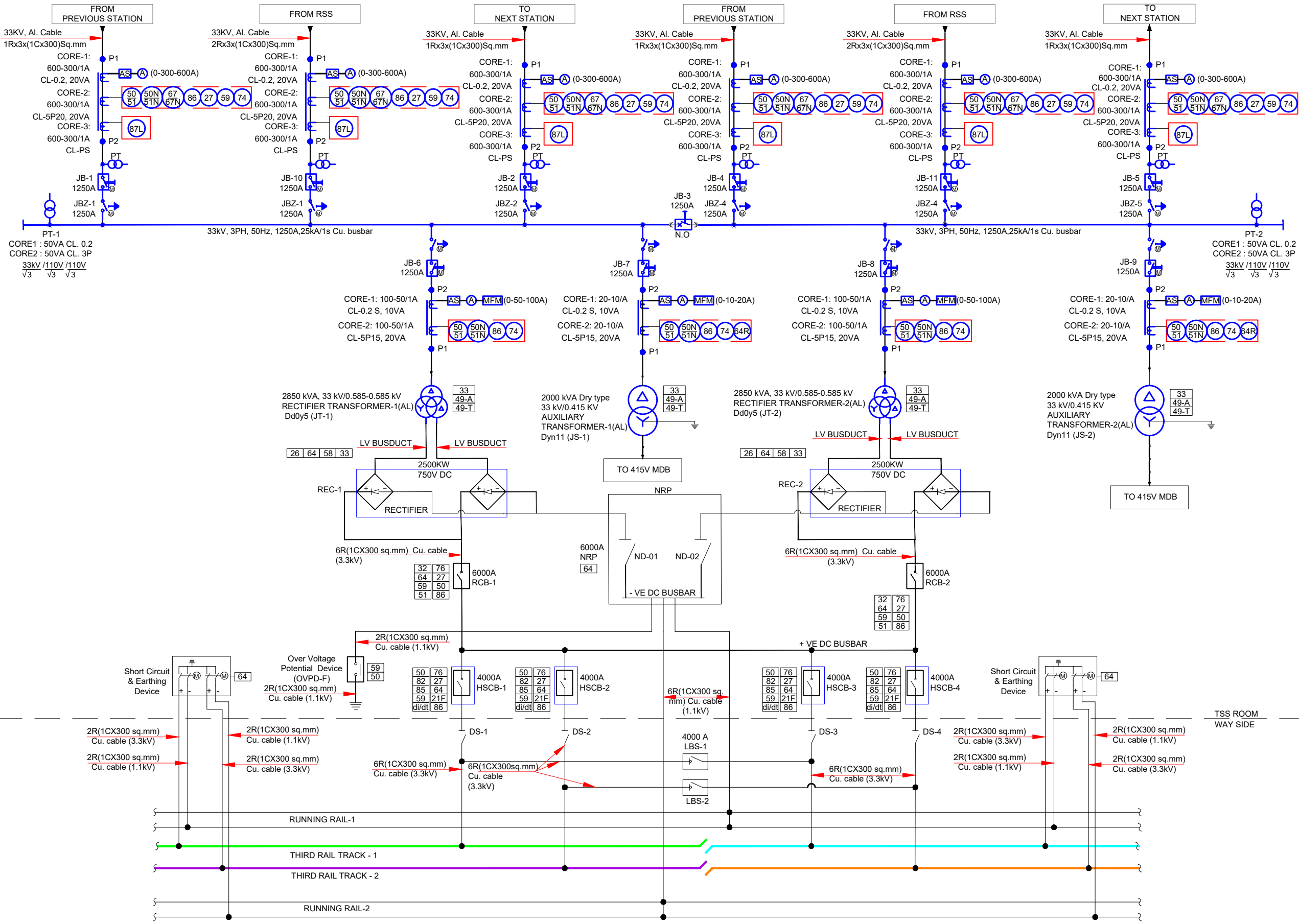
THIS IS CERTIFIED THAT WE HAVE PROOF CHECKED THIS DRAWING BASED ON APPROVED DESIGN .		
☐ NOC	☐ NOWC	☐ RESUBMIT
SIGN:	SIGN:	SIGN:
DATE:	DATE:	DATE:
NAME:	NAME:	NAME:
DESIGNATION:	DESIGNATION:	DESIGNATION:
REVIEWED BY	APPROVED BY	VETTED BY

COUNTER SIGNED BY UPMRCL	DATE	SIGNATURE

PROJECT:	 LUCKNOW METRO RAIL PROJECT PHASE 1B UTTAR PRADESH METRO RAIL CORPORATION LIMITED, ADMINISTRATIVE BUILDING, VIPIN KHAND, GOMATI NAGAR, LUCKNOW, UTTAR PRADESH-226010	
CLIENT: UP METRO RAIL CORPORATION LTD.		
LOCATION: ELEVATED STATION		
TITLE: TYPICAL LIGHTING ARRANGEMENT DETAILS ON VIADUCT		
SCALE: NTS	DATE:	STAGE:
DRG NO:		

OFFICE OF ORIGIN
REVISION NO:

Annexure 15



- NOTE :-
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
 2. ALL EQUIPMENTS DIMENSIONS GIVEN HERE ARE TENTATIVE AND MAY CHANGE DURING DETAIL DESIGN.
 3. THE EQUIPMENT RATINGS INDICATED ARE EXPECTED.
 4. ALL TRANSFORMER IN FEED CABLE SIZE WILL BE 3X(1CX125SQ. MM AL).
 5. THIS DRAWING IS ONLY FOR TENDER PURPOSE AND IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO DEVELOP DETAILED DESIGN AND OBTAIN APPROVAL OF THE ENGINEER.
 6. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECHNICAL SPECIFICATIONS, OTHER TENDER DRAWING AND OTHER PARTS OF TENDER DOCUMENTS, AS RELEVANT.
 7. POWER SUPPLY & TRACTION CONTRACTOR SHALL FOLLOW THE LATEST SOD FOR THIRD RAIL SYSTEM AND OTHER LINE SIDE EQUIPMENT UNDER HIS SCOPE.
 8. CHANGES OF STATIONS, TURNOUTS, CROSSOVER TO BE CONFIRMED BY CIVIL.
 9. THIS SCHEME IS GENERALLY APPLICABLE TO ALL ASS ON MAINLINE.
 10. INTERLOCKS SHALL BE PROVIDED SO THAT THE TRANSFORMER PANEL DOORS CANNOT BE OPENED UNLESS THE ASSOCIATED CIRCUIT BREAKERS ON BOTH SIDES ARE OPEN (ELECTRICAL INTERLOCK).
 11. ASS LOCATION (CONCOURSE/PLATFORM/AT GRADE/MEZZANINE) MAY CHANGE AS PER ACTUAL SITE CONDITIONS. CONTRACTOR HAS TO BEAR ALL SUCH COST ARISING DUE TO THIS CHANGE AT ANY STAGE OF THE PROJECT.
 12. ALL LINE PT RATIO AND BURDEN SAME AS BUS PT.
 13. THE TRACTION CONTRACTOR SHALL HAVE TO PROVIDE EXTRA LOOPING OF 33KV, DC(+VE & -VE) CABLES AS PER REQUIREMENTS WHEREVER FEASIBLE.

LEGEND TABLE

S.NO	SYMBOL	DESCRIPTION
1		VACUUM CIRCUIT BREAKER
2		33KV TRACTION TRANSFORMER
3		AUXILIARY TRANSFORMER
4		RECTIFIER BRIDGE
5		HIGH SPEED CIRCUIT BREAKER (HSCB)
6		OVER VOLTAGE PROTECTIVE DEVICE (OVPD)
7		LOAD BREAK SWITCH (LBS)
8		TWO CORE POTENTIAL TRANSFORMER (PT)
9		TWO CORE CURRENT TRANSFORMER (CT)
10		THREE CORE CURRENT TRANSFORMER (CT)
11		EARTH SWITCH
12		VOLTMETER
13		VOLTAGE SELECTOR SWITCH
14		AMMETER
15		AMMETER SELECTOR SWITCH
16		MULTIFUNCTION METER
17		DISCONNECTOR SWITCH (DS)

1		MASTER TRIP RELAY
2		DIRECTIONAL OC/EF PROTECTION RELAY
3		UNDER VOLTAGE PROTECTION RELAY
4		LINE DIFFERENTIAL PROTECTION RELAY
5		OVER VOLTAGE RELAY
6		DIODE FAILURE (TRIP/ALARM) RELAY
7		RECTIFIER DIODE TEMPERATURE DETECTION UNIT (TWO THRESHOLDS ALARM AND TRIP)
8		REVERSE POWER RELAY
9		TRANSFORMER OVER TEMPERATURE (ALARM)
10		TRANSFORMER OVER TEMPERATURE (TRIP)
11		INSTANTANEOUS OVER CURRENT RELY
12		FRAME LEAKAGE PROTECTION
13		DC OVER CURRENT SERIES TRIP RELAY
14		AUTO RECLOSING RELAY
15		INTER TRIPPING RELAY
16		TRIP CIRCUIT SUPERVISION RELAY
17		LINE TESTING DEVICE
18		OVER CURRENT/EARTH FAULT PROTECTION RELAY
19		RESTRICTED EARTH FAULT

GENERAL NOTES:

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REVISIONS

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	REVISED AS PER CUSTOMER COMMENTS	24-06-2026	VJ	SC
R0	FIRST ISSUE	24-05-2026	BI	SC

APPROVAL OF UPMRCL OFFICIALS

DESIGN IN-CHARGE/ COORDINATOR	DESIGN IN-CHARGE/ COORDINATOR	E&M DESIGN IN-CHARGE/ COORDINATOR

Certified that this document has been designed and checked in accordance with DDC Quality Assurance Plan.

Architecture Design In-charge/ Coordinator

Structure Design In-charge/ Coordinator

E&M Design In-charge/ Coordinator

DETAIL DESIGN CONSULTANT :

ayesa

Ayesa India Private Limited
D 99, 3rd Floor, Sector 2, Noida -201301, Gautam Budh Nagar, Uttar Pradesh
Tel.: +(91) 120 490 8800, Email: delhi@ayesa.com

UTTAR PRADESH METRO RAIL CORPORATION LTD
(Formerly known as Lucknow Metro Rail Corporation Ltd.)
Administrative Building, Near Dr. Bhimrao Ambedkar Samajik Parvatan Sthal, Vipin Khand, Gomti Nagar, Lucknow-226010

PROJECT: Contract LKDDC-02: Engagement of Detailed Design Consultant (DDC) for Civil, Architectural, E&M and Traction Works for the design of 4.29 Km (including ramp) elevated section with 05 elevated Stations, & 6.88 Km (including ramp) underground section with 07 underground Stations One Car Maintenance Depot and stabling lines at Vasantkunj, Lucknow

TRACTION POWER

DRAWING TITLE:

TYPICAL SINGLE LINE DIAGRAM DRAWING OF ASS/TSS (UG) WITH RSS INCOMER- TYPE D

NORTH	DRAWN BY: BI	CHECKED BY: SC	VERIFIED BY: NG	APPROVED BY: PRD	LKDDC-02
	DATE: 24-06-2026	REV: R1	SCALE: NTS	STATUS: PRD	
	DRAWING NUMBER: LKDDC02-TDR-GEN-PST-DWG-38022B	SHEET NO. 01 OF 01	SHEET SIZE A1		

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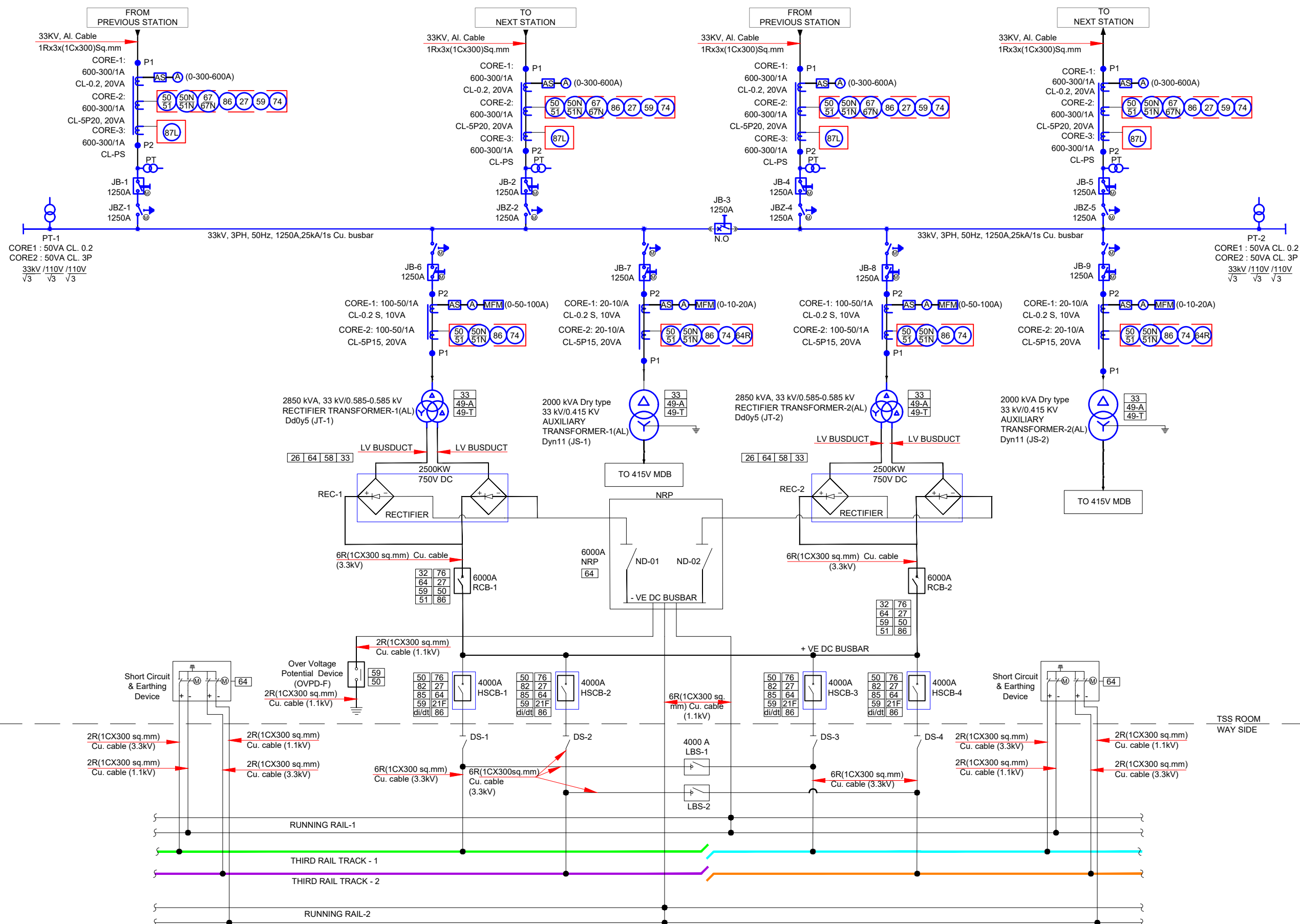
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UTTAR PRADESH METRO RAIL CORPORATION LTD

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NOTE:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ALL EQUIPMENT'S DIMENSIONS GIVEN HERE ARE TENTATIVE AND MAY CHANGE DURING DETAIL DESIGN.
3. THE EQUIPMENT RATINGS INDICATED ARE EXPECTED.
4. ALL TRANSFORMER IN FEED CABLE SIZE WILL BE 3X(1X)12050, MM AL
5. THE DRAWING SHALL BE THE BASIS OF TENDER AND SHALL BE CONTRACTOR'S RESPONSIBILITY TO DEVELOP DETAILED DESIGN AND OBTAIN APPROVAL OF THE ENGINEER.
6. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECHNICAL SPECIFICATIONS. OTHER TENDER DOCUMENTS AND OTHER PARTS OF TENDER SHALL BE READ AS RELEVANT.
7. POWER SUPPLY & TRACTION CONTRACTOR SHALL FOLLOW THE LATEST SOD FOR THIRD RAIL SYSTEM AND OTHER LINE SIDE EQUIPMENT UNDER HIS SCOPE.
8. LOCATION OF STATIONS, TUNNELS, CROSSLINGS TO BE CONFIRMED BY CIVIL.
9. THIS SCHEME IS GENERALLY APPLICABLE TO ALL ASS ON MAINLINE.
10. INTERLOCKING SHALL BE PROVIDED AS PER THE SCHEDULE. LOCKS AND LOCKBOARDS CANNOT BE OPENED UNLESS ASSOCIATED CIRCUIT BREAKERS ON BOTH SIDES ARE OPEN (ELECTRICAL INTERLOCK).
11. ASS LOCATION (CONCOURSE/PLATFORM (GRADEMEZZANINE)) MAY CHANGE AS PER ACTUAL SITE CONDITIONS. CONTRACTOR HAS TO BEAR ALL SUCH COST ARISING DUE TO THIS CHANGE AT ANY STAGE OF THE PROJECT.
12. ALL LINE PT RATIO AND BUREN SAME AS BUS PT.
13. THE TRACTION CONTRACTOR SHALL HAVE TO PROVIDE EXTRA LOOPING OF 33kV, DC(+VE & -VE) CABLES AS PER REQUIREMENTS WHEREVER FEASIBLE.

LEGEND TABLE

S.NO	SYMBOL	DESCRIPTION
1		VACUUM CIRCUIT BREAKER
2		33kV TRACTION TRANSFORMER
3		AUXILIARY TRANSFORMER
4		RECTIFIER BRIDGE
5		HIGH SPEED CIRCUIT BREAKER (HSCB)
6		OVER VOLTAGE PROTECTIVE DEVICE (OVPD)
7		LOAD BREAK SWITCH (LBS)
8		TWO CORE POTENTIAL TRANSFORMER (PT)
9		TWO CORE CURRENT TRANSFORMER (CT)
10		THREE CORE CURRENT TRANSFORMER (CT)
11		EARTH SWITCH
12		VOLTMETER
13		VOLTAGE SELECTOR SWITCH
14		AMMETER
15		AMMETER SELECTOR SWITCH
15		MULTIFUNCTION METER
16		DISCONNECTOR SWITCH (DS)

1	86	MASTER TRIP RELAY
2	87 87N	DIRECTIONAL OC/EF PROTECTION RELAY
3	27	UNDER VOLTAGE PROTECTION RELAY
4	87L	LINE DIFFERENTIAL PROTECTION RELAY
5	59	OVER VOLTAGE RELAY
6	58	DIODE FAILURE (TRIP/ALARM) RELAY
7	26	RECTIFIER DIODE TEMPERATURE DETECTION UNIT (TWO THRESHOLDS ALARM AND TRIP)
8	32	REVERSE POWER RELAY
9	49-A	TRANSFORMER OVER TEMPERATURE (ALARM)
10	49-T	TRANSFORMER OVER TEMPERATURE (TRIP)
11	50	INSTANTANEOUS OVER CURRENT RELY
12	64	FRAME LEAKAGE PROTECTION
13	76	DC OVER CURRENT SERIES TRIP RELAY
14	82	AUTO RECLOSING RELAY
15	85	INTER TRIPPING RELAY
16	74	TRIP CIRCUIT SUPERVISION RELAY
17	21F	LINE TESTING DEVICE
18	50 51 50N 51N	OVER CURRENT/EARTH FAULT PROTECTION RELAY
19	64R	RESTRICTED EARTH FAULT

GENERAL NOTES:

			REVISIONS				
			REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED. BY
REFERENCE DRAWINGS							
REVISION	DESCRIPTION	DRAWING NO.					
			R3	REVISED AS PER CUSTOMER COMMENTS	24-06-2026	VJ	SC
			R2	REVISED AS PER CUSTOMER COMMENTS	24-05-2026	BI	SC
			R1	REVISED AS PER CUSTOMER COMMENTS	14-05-2026	BI	SC
			R0	FIRST ISSUE	11-05-2026	BI	SC

APPROVAL OF UPMRCL OFFICIALS

APPROVAL OF UPMRCL OFFICIALS					

Certified that this document has been designed and checked in accordance with DDC Quality Assurance Plan.

Architecture	Structure	E&M
Design In-charge/ Coordinator	Design In-charge/ Coordinator	Design In-charge/ Coordinator
DETAIL DESIGN CONSULTANT :		

DETAIL DESIGN CONSULTANT



Ayesa India Private Limited
D 99, 3rd Floor, Sector 2, Noida -201301, Gautam
Budh Nagar, Uttar Pradesh
Tel.: +(91) 120 490 8800, Email: delhi@ayesa.com



UTTAR PRADESH METRO RAIL CORPORATION LTD
(Formerly known as Lucknow Metro Rail Corporation Ltd.)
Administrative Building, Near Dr. Bhimrao Ambedkar Samajik Parivartan Sthal,
Vipin Khand, Gomti Nagar, Lucknow-226010

PROJECT: Contract LKDDC-02: Engagement of Detailed Design Consultant (DDC) for Civil, Architectural, E&M and Traction Works for the design of 4.29 Km (including ramp) elevated section with 05 elevated Stations, & 6.88 Km (including ramp) underground with 07 underground Stations One Car Maintenance Depot and stabling lines at Vasantkunj, Lucknow

TRACTION POWER

TRACTION POWER	
PER 1,000 LB. WEIGHT	

DRAWING TITLE:

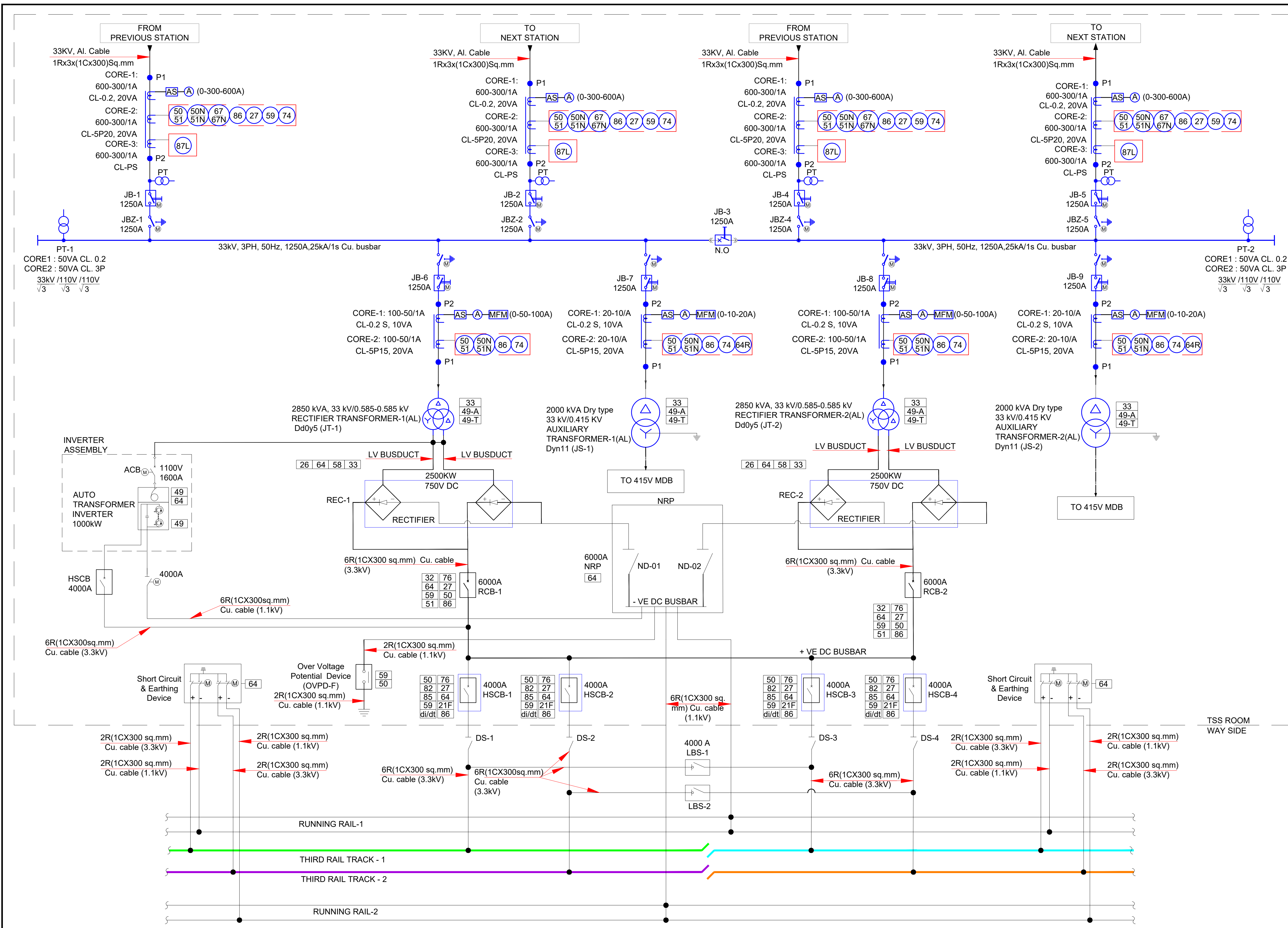
TYPICAL SINGLE LINE DIAGRAM DRAWING OF ASS/TSS (UG) - TYPE F

NORTH	DRAWN BY:	CHECKED BY:	VERIFIED BY:	AD
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NORTH	DRAWN BY : BI	CHECKED BY : SC	VERIFIED BY : RP	APPROVED BY : NG	LKDDC-02
	DATE: 24-06-2026	REV: R3	SCALE: NTS	STATUS: PRD	
	DRAWING NUMBER: LKDDC02-TDR-GEN-PST-DWG-380228		SHEET NO. 01 OF 01	SHEET SIZE A1	
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NOTE :-
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ALL EQUIPMENTS DIMENSIONS GIVEN HERE ARE TENTATIVE AND MAY CHANGE DURING DETAIL DESIGN.
3. THE EQUIPMENT RATINGS INDICATED ARE EXPECTED.
4. ALL TRANSFORMER IN FEED CABLE SIZE WILL BE 30X1CX120SQ. MM AL.
5. THIS DRAWING IS ONLY FOR TENDER PURPOSE AND IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO DEVELOP DETAILED DESIGN AND OBTAIN APPROVAL OF THE ENGINEER.
6. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECHNICAL SPECIFICATIONS, OTHER TENDER DRAWING AND OTHER PARTS OF TENDER DOCUMENTS, AS RELEVANT.
7. POWER SUPPLY & TRACTION CONTRACTOR SHALL FOLLOW THE LATEST SOD FOR THIRD RAIL SYSTEM AND OTHER LINE SIDE EQUIPMENT UNDER HIS SCOPE.
8. CHAINAGE OF STATIONS, TURNOUTS, CROSSOVER TO BE CONFIRMED BY CIVIL.
9. THIS SCHEME IS GENERALLY APPLICABLE TO ALL ASS ON MAINLINE.
10. INTERLOCKS SHALL BE PROVIDED SO THAT THE TRANSFORMER PANEL DOORS CANNOT BE OPENED UNLESS THE ASSOCIATED CIRCUIT BREAKERS ON BOTH SIDES ARE OPEN (ELECTRICAL INTERLOCK).
11. ASS LOCATION (CONCOURSE/PLATFORM/ GRADE/MEZZANINE) MAY CHANGE AS PER ACTUAL SITE CONDITIONS. CONTRACTOR HAS TO BEAR ALL SUCH COST ARISING DUE TO THIS CHANGE AT ANY STAGE OF THE PROJECT.
12. ALL LINE PT RATIO AND BURDEN SAME AS BUS PT.
13. THE TRACTION CONTRACTOR SHALL HAVE TO PROVIDE EXTRA LOOPING OF 33kv, DC(+VE & -VE) CABLES AS PER REQUIREMENTS WHEREVER FEASIBLE.
14. THERE ARE 2 INVERTERS PROPOSED FOR EAST WEST CORRIDOR. HOWEVER, LOCATION OF THE SAME WILL BE DECIDED BASED ON SIMULATION STUDY.

LEGEND TABLE

S.NO	SYMBOL	DESCRIPTION
1		VACUUM CIRCUIT BREAKER
2		33kV TRACTION TRANSFORMER
3		AUXILIARY TRANSFORMER
4		RECTIFIER BRIDGE
5		HIGH SPEED CIRCUIT BREAKER (HSCB)
6		OVER VOLTAGE PROTECTIVE DEVICE (OVPD)
7		LOAD BREAK SWITCH (LBS)
8		TWO CORE POTENTIAL TRANSFORMER (PT)
9		TWO CORE CURRENT TRANSFORMER (CT)
10		THREE CORE CURRENT TRANSFORMER (CT)
11		EARTH SWITCH
12		VOLTMETER
13		VOLTAGE SELECTOR SWITCH
14		AMMETER
15		AMMETER SELECTOR SWITCH
15		MULTIFUNCTION METER
16		DISCONNECTOR SWITCH (DS)

1	86	MASTER TRIP RELAY
2	67N	DIRECTIONAL OC/EF PROTECTION RELAY
3	27	UNDER VOLTAGE PROTECTION RELAY
4	87L	LINE DIFFERENTIAL PROTECTION RELAY
5	59	OVER VOLTAGE RELAY
6	58	DIODE FAILURE (TRIP/ALARM) RELAY
7	26	RECTIFIER DIODE TEMPERATURE DETECTION UNIT (TWO THRESHOLDS ALARM AND TRIP)
8	32	REVERSE POWER RELAY
9	49-A	TRANSFORMER OVER TEMPERATURE (ALARM)
10	49-T	TRANSFORMER OVER TEMPERATURE (TRIP)
11	50	INSTANTANEOUS OVER CURRENT RELY
12	64	FRAME LEAKAGE PROTECTION
13	76	DC OVER CURRENT SERIES TRIP RELAY
14	82	AUTO RECLOSING RELAY
15	85	INTER TRIPPING RELAY
16	74	TRIP CIRCUIT SUPERVISION RELAY
17	21F	LINE TESTING DEVICE
18	50N, 51N	OVER CURRENT/EARTH FAULT PROTECTION RELAY
19	64R	RESTRICTED EARTH FAULT

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED.
- ALL DIMENSIONS ARE TO BE READ AND NOT MEASURED.
- ANY DISCREPANCY MUST BE BROUGHT TO THE NOTICE OF THE UPMRCL BEFORE EXECUTION OF WORK AT SITE.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, STRUCTURAL, PLUMBING & FIRE FIGHTING, ELECTRICAL AND TRAFFIC MANAGEMENT DRAWINGS.
- ALL DOOR/WINDOW CILL & LINTEL LEVELS ARE MEASURED FROM MAIN FLOOR FINISHED LEVELS.

REVISIONS

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R3	REVISED AS PER CUSTOMER COMMENTS	24-06-2026	VJ	SC
R2	REVISED AS PER CUSTOMER COMMENTS	24-05-2026	BI	SC
R1	REVISED AS PER CUSTOMER COMMENTS	14-05-2026	BI	SC
R0	FIRST ISSUE	11-05-2026	BI	SC

APPROVAL OF UPMRCL OFFICIALS

Architecture	Structure	E&M
Design In-charge/ Coordinator	Design In-charge/ Coordinator	Design In-charge/ Coordinator

DETAIL DESIGN CONSULTANT :

Ayesa India Private Limited
D 99, 3rd Floor, Sector 2, Noida -201301,Gautam
Budh Nagar, Uttar Pradesh
Tel.: +(91) 120 490 8800, Email: delhi@ayesa.com

Certified that this document has been designed and checked in accordance with DDC Quality Assurance Plan.

UTTAR PRADESH METRO RAIL CORPORATION LTD
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TRACTION POWER

DRAWING TITLE:

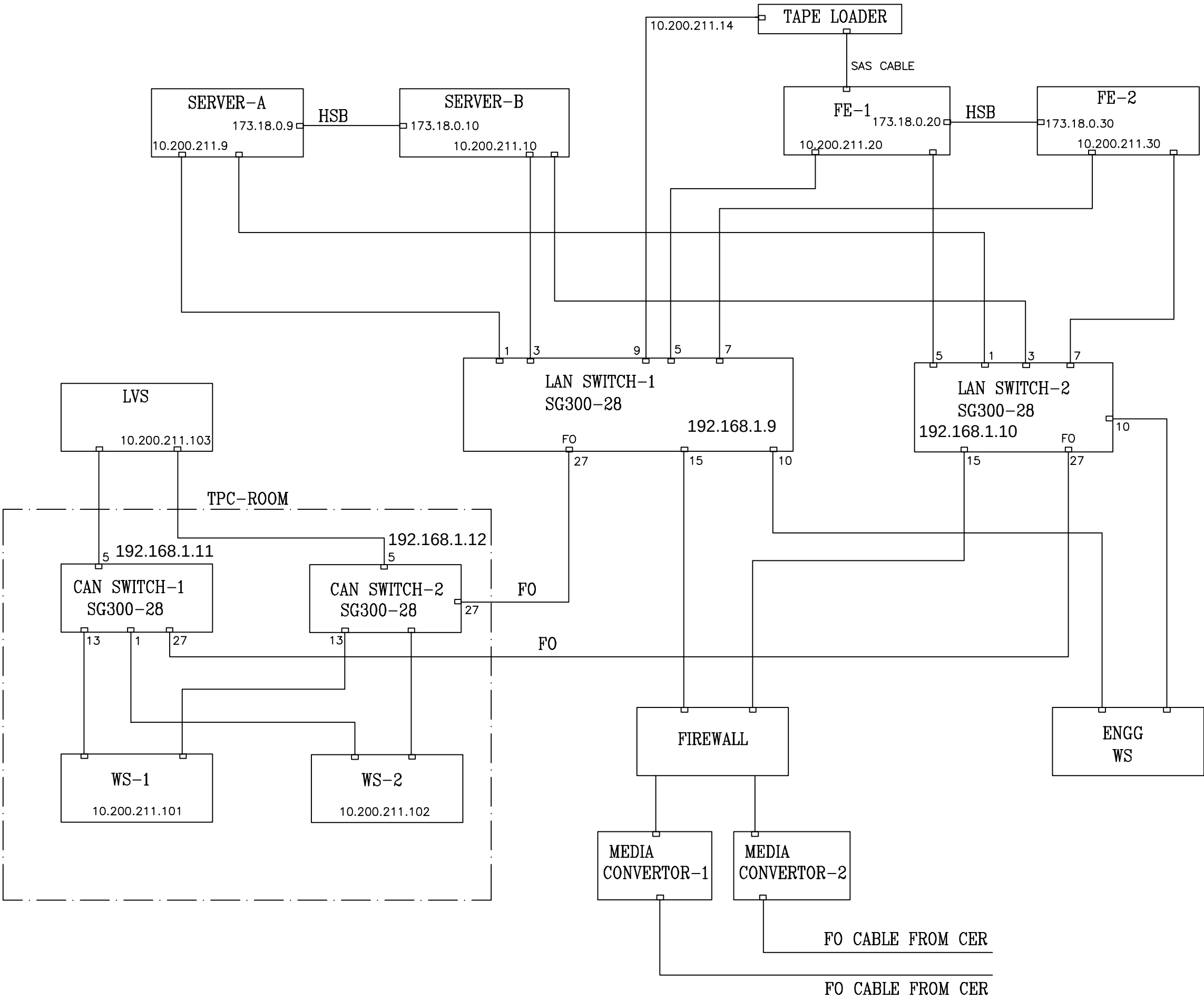
TYPICAL ASS/TSS SINGLE LINE DIAGRAM WITH INVERTER (UG) - TYPE H

NORTH	DRAWN BY : BI	CHECKED BY: SC	VERIFIED BY: RP	APPROVED BY: NG
	DATE: 24-06-2026	REV: R3	SCALE: NTS	STATUS: PRD
	DRAWING NUMBER: LKDDC02-TDR-GEN-PST-DWG-380238		SHEET NO: 01 OF 01	SHEET SIZE: A1

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SCADA SYSTEM :LMRC

CHANGE PROPOSED



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Sheet	Cont.
Drawn by	Design checked by
Year	Rev
Week	Dept.

Sheet	Cont.
Drawn by	Design checked by
Year	Rev
Week	Dept.

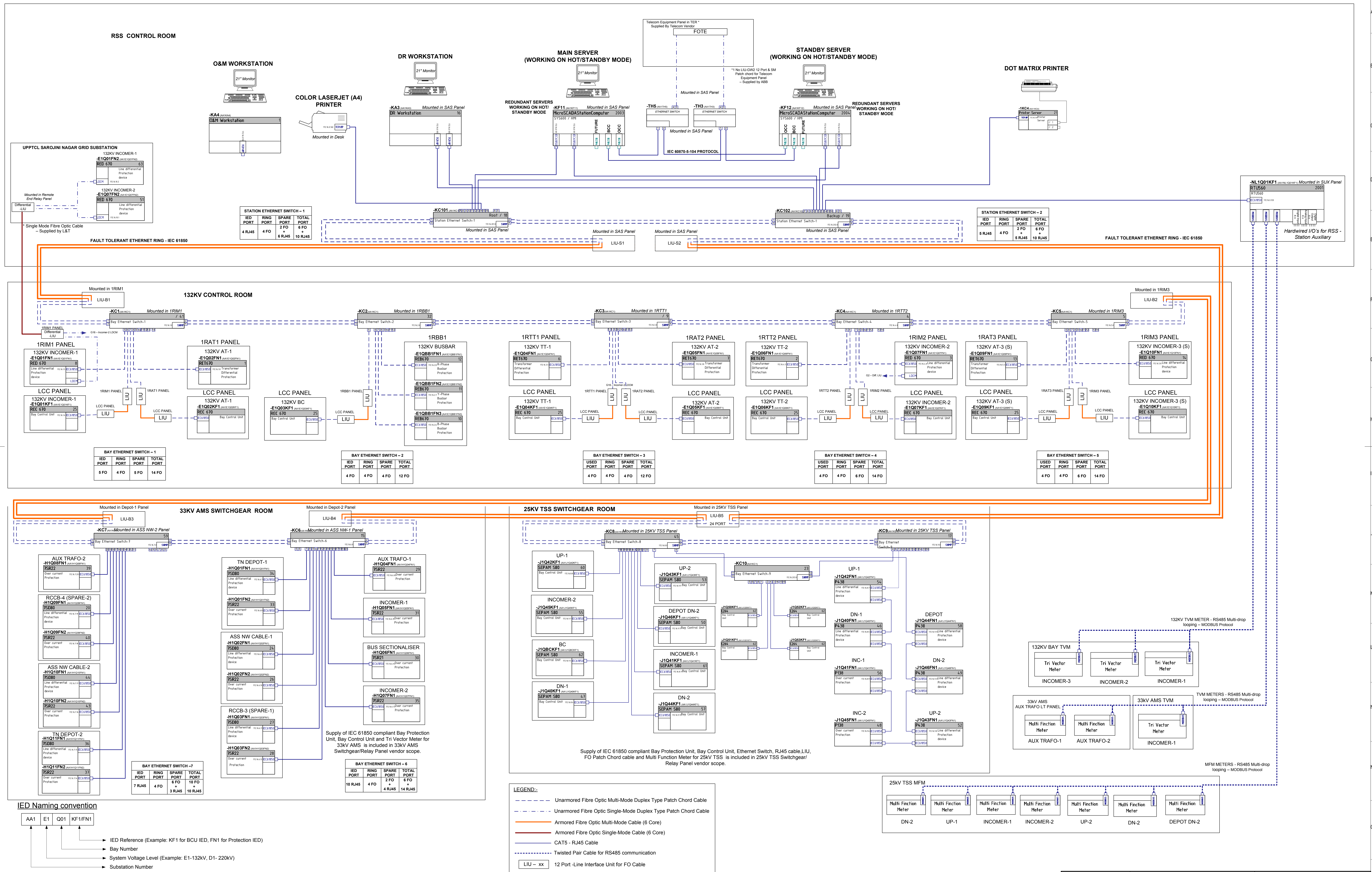
220kV MUNSHI PULIA - RSS - SUBSTATION AUTOMATION SYSTEM - COMMUNICATION CONNECTIVITY DIAGRAM



ABB ABB INDIA LTD.,

LUCKNOW METRO RAIL CORPORATION

TRANSPORT NAGAR - RSS - SUBSTATION AUTOMATION SYSTEM - COMMUNICATION CONNECTIVITY DIAGRAM



Note:-

- All the ports of Ethernet switches to which Fiber Optic/CAT-5 cable are not connected shall be considered as spare ports.
- Supply of Bay Protection Unit, Bay Control Unit and Tri Vector Meter for 33KV AMS and 25KV TSS Switchgear/Relay Panel vendor scope.
- Supply, Laying & Termination of Armoured FO cable for UPTCL GSS TO LMRC-Transport Nagar RSS is included in L&T Scope of supply
- Telecom Vendor will provide the NTP Port at RSS from Master Clock for RSS-SAS Time Synchronization.

Based on SALE ORDER NO. 310056266	CLIENT: LUCKNOW METRO RAIL CORPORATION LIMITED	TITLE: COMMUNICATION CONNECTIVITY DIAGRAM - SAS
Prepared: M. V. GISHI	CONTRACTOR: LARSEN & TOUBRO LIMITED- POWER TRANSMISSION AND DISTRIBUTION	LUCKNOW METRO RAIL CORPORATION LIMITED-LMRC
Approved: M. V. GISHI		
Project: LUCKNOW METRO RAIL CORPORATION LIMITED	Doc. des: COMMUNICATION CONNECTIVITY DIAGRAM - SAS	Ref. des:
1323KV RSS / AMS / TSS TRANSPORT NAGAR - SUBSTATION AUTOMATION SYSTEM (PACKAGE-L&E-162)	Doc. No.: YNM302645-C2M	
Res. dept: PG&A-GAS	Rev. ind: 00	Lang: English
Doc. No.: YNM302645-C2M		Sheet: 01
		No. of sh: 01

ABB

ABB INDIA LTD.,

Rev. 01

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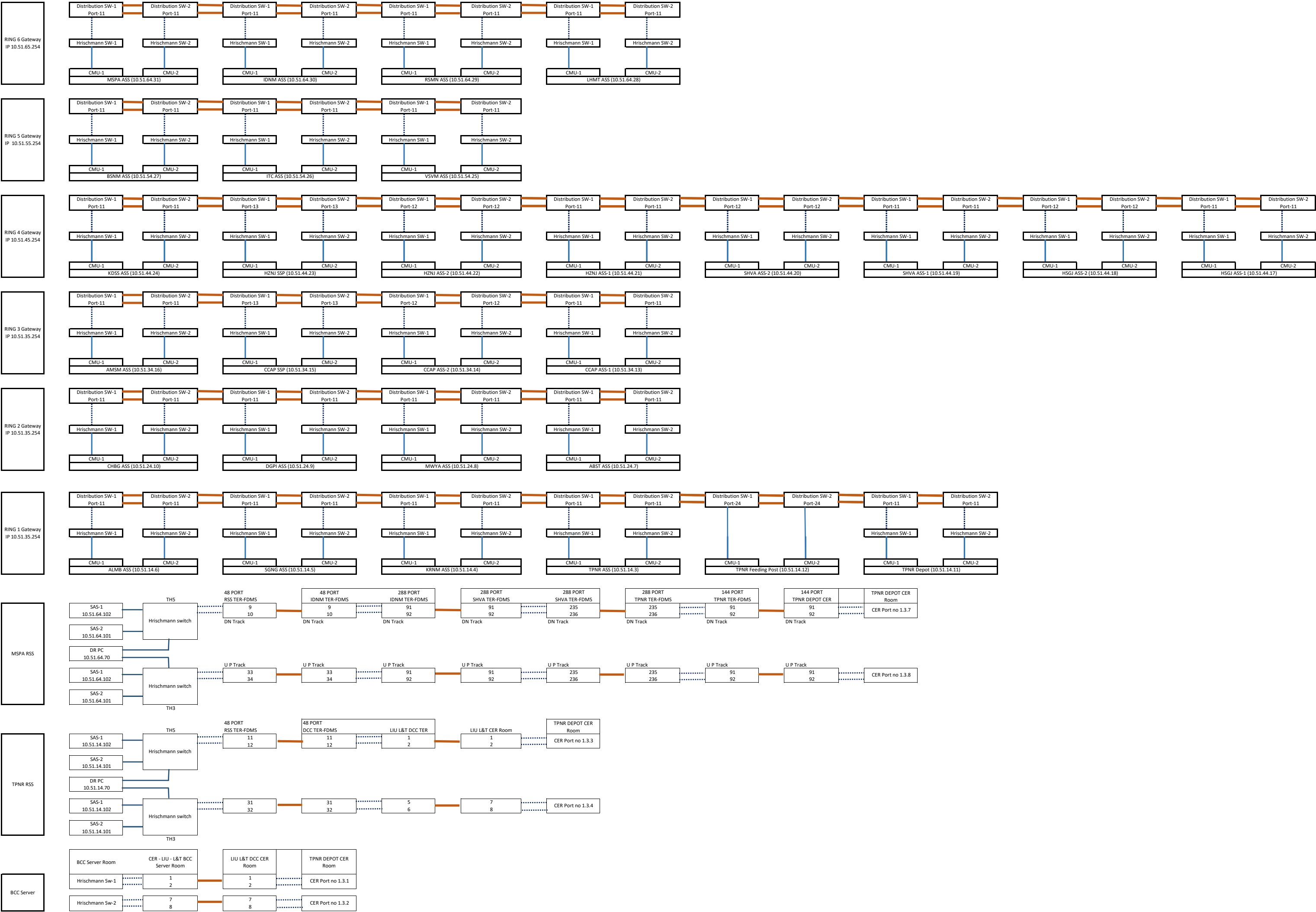
Rev.

Rev.

Rev.

Rev.

Annexure 15



प्रेषक,

सचिव,

उत्तर प्रदेश भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड,
द्वितीय तल, ए एवं डी ब्लॉक, किसान मण्डी भवन,
विभूति खण्ड, गोमती नगर, लखनऊ।

सेवा में,

श्रम आयुक्त, उत्तर प्रदेश,
जी०टी० रोड,
कानपुर।

DLC (B4C)

15-10-24

पत्रांक 3553-55 / भ०नि०बो०-(1492-3ए)24

दिनांक : 01/10/2024

विषय:- भवन एवं अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा-शर्त विनियमन) अधिनियम, 1996 व भवन एवं अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 के प्रावधानों एवं निर्माण लागत के बीजक में सम्मिलित जी०एस०टी० की देयता के सम्बंध में।

महोदय,

कृपया अपने कार्यालय के पत्र सं० 3752/भ०नि०प्रको०-24 दिनांक 20.02.2024 का संदर्भ ग्रहण करने का कष्ट करें जिसके द्वारा शासन के पत्र सं० 844/36-2-2023 दिनांक 01.06.2023 के क्रम में उ०प्र० पावर कारपोरेशन, लखनऊ के पत्र दिनांक 20.04.2023, उ०प्र० मेट्रो रेल कारपोरेशन लि० के पत्र दिनांक 01.11.2023 एवं अधिशासी अभियंता, विश्व बैंक खण्ड, लोक निर्माण विभाग, कानपुर के पत्र दिनांक 23.12.2023 को संलग्न करते हुए सेवायोजकों द्वारा भवन एवं अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 के अन्तर्गत कराये गये निर्माण की लागत पर जी०एस०टी० सहित 01 प्रतिशत उपकर की गणना अथवा जी०एस०टी० रहित उपकर की गणना किये जाने के प्रकरण को बोर्ड की 64वीं बैठक में निर्णयार्थ प्रस्तुत किया गया।

उपर्युक्त क्रम में अवगत कराना है कि उत्तर प्रदेश सरकार द्वारा जारी अधिसूचना संख्या 1087/9-वि-1-18-1 (क)-29-2017 लखनऊ, 18 मई, 2018 के बिन्दु-2 के अन्तर्गत भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 की धारा 3 में, उपधारा (1) में, निम्नलिखित स्पष्टीकरण, अन्त में बढ़ा दिया जाएगा, अर्थात्:-

“स्पष्टीकरण:- इस उपधारा के अधीन उपकर के उद्ग्रहण में प्रयोजनार्थ, सन्निर्माण की लागत में, भवन या अन्य सन्निर्माण कार्य के संबंध में किसी नियोजन द्वारा उपगत समस्त व्यय सम्मिलित होगा किन्तु उसमें निम्नलिखित सम्मिलित नहीं होंगे-

(क) भूमि की लागत

(ख) कर्मचारी प्रतिकर अधिनियम, 1923 के अधीन किसी कर्मकार या उसके आश्रितों को संदत्त या संदेय कोई प्रतिकर,

(ग) ऐसे संयंत्र, उपस्कर, जो सन्निर्माण क्रियाकलाप के भाग न हों, को लगाये जाने या उन्नत किये जाने पर उपगत व्यय,

(घ) चिकित्सालयों में रोगियों के उपचार हेतु प्रयुक्त मशीनें यथा एम०आर०आई०, सी०टी० स्कैन, डायलिसिस मशीन आदि।”

अतः उक्त 04 प्रकार के मदों को छोड़कर निर्माण पर व्यय होने वाली समस्त लागत जिसमें जी०एस०टी० भी सम्मिलित है, पर उपकर की देयता बनती है, तदनुसार सम्बन्धित विभागों को अवगत कराने का प्रस्ताव बोर्ड की 64वीं बैठक दिनांक 12.07.2024 में निर्णयार्थ प्रस्तुत किया गया जिसपर बोर्ड द्वारा “भवन एवं अन्य सन्निर्माण कर्मकार कल्याण उपकर

अधिनियम, 1996" एवं तत्सम्बंधी नियमावली में उल्लिखित प्रावधानों के अंतर्गत कार्यवाही किये जाने के सर्वसम्मति से निर्देश प्रदान किये गये।

कृपया उपर्युक्तानुसार अवगत होते हुए अग्रेतर कार्यवाही करने का कष्ट करें।
संलग्नक:- यथोक्त।

भवदीया,

(गजल भारद्वाज)
सचिव, बोर्ड।

पत्र सं०:-

/भ०नि०बो०(1492-3ए)24

दिनांक / /2024

प्रतिलिपि:-निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. अध्यक्ष, उत्तर प्रदेश भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड।
2. समस्त क्षेत्रीय एवं जनपदीय अधिकारी उ०प्र०।

(गजल भारद्वाज)
सचिव, बोर्ड।

क्रम-संख्या-120



रजिस्ट्रेशन नम्बर-एस०एस०पी०/एल०

डब्लू०/एन०पी०-११/२०१४-१६

लाइसेन्स टू पोस्ट एंट कन्सेशनल रेट

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट

भाग-१, खण्ड (क)

(उत्तर प्रदेश अधिनियम)

लखनऊ, शुक्रवार, १८ मई, २०१८

बैशाख २८, १९४० शक सम्वत्

उत्तर प्रदेश शासन

विधायी अनुभाग-१

संख्या १०८७/७९-वि-१-१८-१(क)-२९-२०१७

लखनऊ, १८ मई, २०१८

अधिसूचना

विविध

“भारत का संविधान” के अनुच्छेद २०१ के अधीन राष्ट्रपति महोदय ने भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर (उत्तर प्रदेश संशोधन) विधेयक, २०१७ पर दिनांक ०९ मई, २०१८ को अनुमति प्रदान की और वह उत्तर प्रदेश अधिनियम संख्या २८ सन् २०१८ के रूप में सर्वसाधारण की सूचनार्थ इस अधिसूचना द्वारा प्रकाशित किया जाता है।

भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर (उत्तर प्रदेश संशोधन)

अधिनियम, २०१७

(उत्तर प्रदेश अधिनियम संख्या २८ सन् २०१८)

[जैसा उत्तर प्रदेश विधान मण्डल द्वारा पारित हुआ]

भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, १९९६ का उत्तर प्रदेश में उसकी प्रवृत्ति के संबंध में अग्रतर संशोधन के लिये

अधिनियम

भारत गणराज्य के अड़सठवें वर्ष में निम्नलिखित अधिनियम बनाया जाता है :-

१-(१) यह अधिनियम भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर (उत्तर प्रदेश संशोधन) अधिनियम, २०१७ कहा जायेगा।

(२) इसका विस्तार सम्पूर्ण उत्तर प्रदेश में होगा।

सक्षिप नाम
और विवरण

अधिनियम संख्या
28 सन् 1996 की
धारा 3 का
संशोधन

2-भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 की धारा 3 में, उपधारा (1) में, निम्नलिखित स्पष्टीकरण, अन्त में बढ़ा दिया जायेगा, अर्थात्—
‘स्पष्टीकरण:— इस उपधारा के अधीन उपकर के उद्ग्रहण के प्रयोजनार्थ, सन्निर्माण की लागत में, भवन या अन्य सन्निर्माण कार्य के संबंध में किसी नियोजक द्वारा उपगत समस्त व्यय सम्मिलित होगा किन्तु उसमें निम्नलिखित सम्मिलित नहीं होंगे—

(क) भूमि की लागत;

(ख) कर्मचारी प्रतिकर अधिनियम, 1923 के अधीन किसी कर्मकार या उसके आश्रितों को संदत्त या संदेय कोई प्रतिकर;

(ग) ऐसे संबंध, उपस्कर, जो सन्निर्माण क्रियाकलाप के भाग न हो, को लगाये जाने या उन्नत किये जाने पर उपगत व्यय;

(घ) चिकित्सालयों में रोगियों के उपचार हेतु प्रयुक्त मशीनें यथा एम0आर0आई0, सी0टी0 स्कैन, डायलिसिस मशीन आदि।’

उद्देश्य और कारण

भवन और अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा शर्त विनियमन) अधिनियम, 1996 के अधीन गठित भवन और अन्य सन्निर्माण कर्मकार कल्याण बोर्डों के संसाधनों में वृद्धि करने के उद्देश्य से नियोजकों द्वारा उपगत सन्निर्माण की लागत पर उपकर का उद्ग्रहण तथा संग्रहण करने के लिये उपबंध करने हेतु भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 (अधिनियम संख्या 28 सन् 1996) अधिनियमित किया गया था।

उक्त अधिनियम की धारा 3 की उपधारा (1) में यह उपबंध है कि भवन और अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा शर्त विनियमन) अधिनियम, 1996 के प्रयोजन के लिये केन्द्र सरकार द्वारा समय-समय पर सरकारी गजट में अधिसूचना द्वारा यथा विनिर्दिष्ट किसी कर्मचारी द्वारा उपगत सन्निर्माण लागत के अनधिक दो प्रतिशत किन्तु अन्यून एक प्रतिशत की दर पर उपकर का उद्ग्रहण और संग्रहण किया जायेगा। इस उपधारा में उपकर के निर्धारण हेतु भूमि के मूल्य, किसी कर्मकार या उसके उत्तराधिकारियों को संदत्त प्रतिकर एम0आर0आई0, सी0टी0 स्कैन और डायलिसिस जैसे मशीनों, जो उपकर के निर्धारण से छूट प्राप्त है, सहित उत्पादन तथा उन्नत किये जाने वाले संयंत्रों और उपकरणों के आगणन का उपबंध नहीं है। मुकदमेबाजी के दबावों को कम करने के उद्देश्य से यह विनिश्चय किया गया है कि उक्त धारा का, उसमें स्पष्टीकरण अंतःस्थापित करते हुए उत्तर प्रदेश में उसकी प्रवृत्ति के सम्बंध में संशोधन किया जाय।

तदनुसार भवन और अन्य सन्निर्माण कर्मकार कल्याण उपकर (उत्तर प्रदेश संशोधन) विधेयक, 2017 पुरन्थापित किया जाता है।

आज्ञा से,

वीरेन्द्र कुमार श्रीवास्तव,
प्रमुख सचिव।

No. 1087(2)/LXXIX-V-1-18-1(ka)-29-2017

Dated Lucknow, May 18, 2018

In pursuance of the provisions of clause (3) of Article 348 of the Constitution, the Governor is pleased to order the publication of the following English translation of the Bhawan aur Anya Sannirman Karmkar Kalyan Upkar (Uttar Pradesh Sanshodhan) Adhiniyam, 2017 (Uttar Pradesh Adhiniyam Sankhya 28 of 2018) as passed by the Uttar Pradesh Legislature and assented to by the President on May 09, 2018:

THE BUILDING AND OTHER CONSTRUCTION WORKERS WELFARE CESS

(UTTAR PRADESH AMENDMENT) ACT, 2017

(U.P. ACT NO. 28 OF 2018)

[As passed by the Uttar Pradesh Legislature]

AN

ACT

further to amend the Building and Other Construction Workers' Welfare Cess Act, 1996 in its application to Uttar Pradesh.

IT IS HEREBY enacted in the Sixty-eighth Year of the Republic of India as follows:—

Short title
and extent

1. (1) This Act may be called the Building and Other Construction Workers Welfare Cess (Uttar Pradesh Amendment) Act, 2017.

(2) It extends to the whole of Uttar Pradesh.

उत्तर प्रदेश असाधारण गजट, 18 मई, 2018

3

2. In section 3 of the Building and Other Construction Workers' Welfare Cess Act, 1996, in sub-section (1) the following explanation shall be inserted at the end, namely:-

Amendment of section 3 of Act no 28 of 1996

"Explanation:- For the purpose of levy of cess under this sub-section cost of construction shall include all expenditure incurred by an employer in connection with the building or other construction work but shall not include -

- (a) cost of land;
- (b) any compensation paid or payable to a worker or his dependents under the Employees's Compensation Act, 1923;
- (c) expenditure incurred on such plant, equipments installed or upgraded which are not part of construction activity;
- (d) machines such as MRI, CT Scan, Dialysis machine etc. used for treatment of patients in hospitals."

STATEMENT OF OBJECTS AND REASONS

The Building and Other Construction Workers' Welfare Cess Act, 1996 (Act no. 28 of 1996) was enacted to provide for the levy and collection of a cess on the cost of construction incurred by employers with a view to augmenting the resources of the Building and Other Construction Workers' Welfare Boards constituted under the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.

Sub-section (1) of section 3 of the said Act provides that there shall be levied and collected cess for the purposes of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 at such rate not exceeding two per cent but not less than one per cent of the cost of constructions incurred by an employer, as the Central Government may, by notification in the official Gazette, from time to time specify. This sub-section does not provide to take into account the value of land, compensation paid to any worker or his heir for the assessment of the cess, the plant and equipment for the production and upgradation work including the machines like MRI, CT Scans and Dialysis machines, etc. which are exempted from the assessment of the cess. With a view to lessen the pressure of litigation, it has been decided to amend the said section in its application to Uttar Pradesh by inserting an explanation therein.

The Building and Other Construction Workers' Welfare Cess (Uttar Pradesh Amendment) Bill, 2017 is introduced accordingly.

By order,
VIRENDRA KUMAR SRIVASTAVA,
Pramukh Sachiv.

पी०एस०यू०पी०-ए०पी० 75 राजपत्र-2018-(186)-699 प्रतियां-(कम्प्यूटर/टी०/ऑफसेट)
पी०एस०यू०पी०-ए०पी० 10 सा० विधायी-2018-(187)-300 प्रतियां-(कम्प्यूटर/टी०/ऑफसेट)

Annexure 17

LKE (02)-01: Design, Supply, Installation, Testing & Commissioning of Receiving cum Auxiliary Main Sub Stations Including 750 volts DC 3rd Rail Traction System, 33kV Cable Network, ASS, TSS & SCADA System for East West Corridor (Phase 1 B) of Lucknow Metro Rail Project at Lucknow, Uttar Pradesh, India.

Cost of Tender documents	INR 23,600/- (inclusive of 18% GST) Non-Refundable (Payment of tender document cost/ tender fee is to be made only by RTGS, NEFT & IMPS. No other mode of payment will be accepted. The details of bank account of employer are mentioned in succeeding para.. The Tenderers are required to upload scanned copies of transaction of payment of tender document cost/tender fee including e-receipt (clearly indicating UTR No. & tender reference i.e. LKE (02)-01 must be entered in the remarks at the time of online transaction of payment) failing which payment may not be considered at the time of online bid submission. (Copy of GST registration no. to be provided along with Tender document cost / tender fee, if applicable)
Details of Bank Account for payment of Tender Security/ EMD and cost of tender document	Name of the Bank - HDFC Bank Banks Address - HDFC Bank Ltd, 6 Sapru Marg Hazratganj Lucknow Account Name - UPMRCL (Lucknow Project) Account No. - 50200009236810 IFSC code - HDFC0001267
Pre-bid Meeting	11.06.2026 @ 15:00 Hrs The pre-bid meeting shall be conducted through video conferencing by software apps such as Google Meet, Microsoft Team, etc. All Prospective tenderers who have made online payment towards the cost of tender document shall provide the details of the person(s) (maximum up to two) who will be participating in such virtual meeting at least one day before the meeting to the registered official email of Employer i.e. liladharsingh.yadav@upmrcl.co.in, lketraction1b@gmail.com/ along with scanned copy of transaction of payment of tender cost / tender fee, including e-receipt (clearly indicating UTR No. and tender reference) and GST copy, so that links having details such as software, meeting ID, password etc. can be mailed to these persons at least 12 hours before the scheduled pre-bid meeting.
Last date of Seeking Clarification:	12.06.2026 up to 18:00 hrs. Tenderers to note that seeking clarification on the tender shall be done by sending it on e-tendering portal only. Seeking clarification by mail or post will not be considered. Queries/clarifications from Tenderers after due date and time shall not be acknowledged.
Date & time of Submission of Tender online	Tender submission start date: ~~03.07.2026~~ 10.07.2026 (11:00 hrs). Tender submission end date ~~14.07.2026~~ 21.07.2026 (15:00 hrs).
Date & time of opening of Tender	~~15.07.2026~~ 22.07.2026 @ 15:00 Hrs.
Authority and place for seeking clarifications etc.	GM/ Electrical, Uttar Pradesh Metro Rail Corporation, Administrative Building, Vipin Khand, Gomti Nagar, Near Dr. Bhimrao Ambedkar Samajik Parivartan Sthal, Lucknow-226010, Uttar Pradesh, India Telephone - 0522-2304015 E-Mail – liladharsingh.yadav@upmrcl.co.in lketraction1b@gmail.com https://etenders.gov.in/eprocure/app

Any clarification/corrigendum/addendum to the tender documents shall be uploaded on the official e-portal only, without any obligation of press notification.

Item No.	Item Description	LKE (02)-01 Contractor	E&M Contractor
15.	Cable route and Cable tray for SCADA communication cable	a. Shall provide requirement of cable route and cable tray for laying of SCADA communication cables from ASS RTU to TER. b. Shall supply and lay SCADA communication cables from ASS RTU to TER.	a. Shall provide cable route and install support (metallic cable tray, conduit etc.) for laying of SCADA communication cables from RTU panel to Telecom rack at Telecom Equipment Room.

3.1.8 INTERFACE WITH UNDERGROUND STATION E&M SERVICES CONTRACTORS

E&M services Contractors of Underground stations shall be responsible for works associated with E&M services of station building (Except RSS building). The interface items associated with E&M services Contractor are listed in Table 3.1.7 ~~3.1.7~~ given below:

Table 3.1.8 Interfacing Requirements with Underground E&M services Contractor

Item No	Item Description	LKE (02)-01 Contractor	UG/E&M Contractor
1	Installation of 33 kV, 750 V DC cables, traction return cables and PLC cable for ETS connection and other control cables, earth strips/ earthing cables in station and tunnel area.	a. Shall supply & install 33 kV, 750 V DC Cables, return cables and PLC cable for ETS connection and other control cables, earth strips/earthing cables in station and tunnel area. b. Shall co-ordinate and give requirements to the UG (E&M) for the cable path, gallery size, route alignment and mounting requirements for 33 KV, 750 V, positive & return cables, LV AC cables, LV control cables, earthing strips/cables and LT Power & PLC cable for ETS connection in the tunnel. c. Shall confirm the requirements for passages for cable	a. Shall design, supply and install cable trays (including metallic support, brackets, cable ladder including calculations etc.) as per requirement in stations and tunnels. b. Design, supply, installation of cable trays inside the ASS/TSS(<u>other than Traction</u>) by UG (E&M) Contractor c. All cable supports and infrastructure inside the tunnel and at station area for 33 kV cable, 750 V DC cable, return cables, ETS cables, earthing cables, other control cables to be provided by E&M contractor