Bharat Heavy Electricals Limited

(A Govt. of India Undertaking)
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CORRIGENDUM - 03 TO NIT NO-73065

Dated 06.05.2023

Subject: Corrigendum-03 to Tender enquiry for Supply & Services of 400 kV GIS FOR OPTCL ERSAMA, PARADEEP PROJECT.

Project	: OPTCL ERSAMA, PARADEEP Project
Equipment / Item	: SUPPLY & SERVICES OF 400kV GIS.
Enquiry No/Date	: Enquiry No_61G2300342 Dtd 05-04-2023
BHEL NIT NO	: 73065
Original Tender due date	**: 27.04.2023**

This Corrigendum is issued by BHEL-TBG against above mentioned NIT/ enquiry **for issuance of -**

a) Technical and Commercial clarifications in response to pre-bid queries of bidders (enclosed),

b) Technical Corrigendum (in addition to pre-bid clarifications) and

c) Extension of due date of tender submission/opening up to 15.05.2023.

All other terms and conditions for this tender enquiry shall remain unchanged.

Bidder to ensure submission of offer on or before due.

Note: Tender ID in CPP Portal is **2023_BHEL_23786_1.**

Thanking you

-------Sd/------
Gaurav Agarwal
BHEL TBG, NOIDA

PRE BID CLARIFICATIONS (TECHNICAL)

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL

NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023

Bidder 01

Sl. No.	Clause no./ Doc Reference	Technical Specification clause description	Deviations/ clarifications sought by bidders	Clarifications/ confirmations by BHEL/ Customer
18	Section-1: Clause 3, Note 8	Any change in bay pitch (distance between bays): In a case where shifting of GIS bays shall be called for by BHEL (during contract stage) due to layout requirement /cost optimization / revision / change in civil architectural requirement or due to expansion joint requirement in the GIS building, Bidder to incorporate the same with full compliance of technical requirement. Payment equivalent under the relevant item of BPS / BOQ item shall be operated for additional length of Main Bus, subject to such shifting is not attributed to bidder.	Request for CAD layout drawing with column and beams marked to make precise offer without any assumptions.	Noted. Autocad drawings are also attached. Bidders are requested to propose the suitable column locations.
19	Section-1: 4.1	Other general requirements 1. Schedule In addition to this, packing of GIS & its accessories shall be suitable for long term storage without any deterioration in quality and performance (min. 2 years, if required).	Packing of GIS and its accessories shall be suitable for 6 months storage subject to buyer following seller's storage instructions. We recommend to have closed storage for all GIS materials if stored beyond 6 Months.	Please comply technical specification.
20	Section-1: 7	The validity of type test reports shall be as per the latest CEA guidelines (amended time to time) as on the original scheduled date bid submission for BHEL tender (i.e. 11.02.2022) In case, where type test certificates are older than period as per latest CEA guidelines (amended time to time), bidder/ manufacturer shall carry out the type tests prior to dispatch of equipment without any commercial implication on BHEL/ OPTCL.	As per latest CEA guidelines, TTRs <15 years are acceptable. We will submit the Type test reports of GIS for review. We do not envisage repetition of any type tests in our offer as the same is performed once for the design and will have huge impact on cost and delivery time.	Noted, however, it shall be finalized during detailed engineering stage.
21	Section-1: 12.3	3. Installation / Erection of GIS with LCC & its Accessories except supervision work. However, complete supply and installation of Online PD Monitoring system for both 400kV & 220kV GIS shall be in bidder's scope.	We propose our own make of PD monitoring system for our GIS. Same will not supplied for 220kV GIS of other make. Hence PDMS for 220kV GIS is excluded.	Not accepted. Please comply BOQ and technical specification.
22	Section-1: 5.2 Annexure-BOQ: A.7	Bus duct quantity - 1050 Mtrs BHEL reserves the right for quantity variation due to any reason upto ±20% of total value at same unit rate and terms during execution of contract. The quantity of individual items may however vary upto any extent.	Pdf layout drawing of customer is available. Request for CAD layout drawing with termination points to have correct GIB length. Any increase or decrease shall be paid at actuals as per unit price indicated.	Noted. Payment shall be made as per actual as per approved layout during detailed engineering stage in line with BOQ and technical specification. CAD layout is also enclosed for reference.
23	Annexure-BOQ: A	The 400 KV, 3150A, 63kA for (3 sec for Bus Bar & CB) & 63kA for (1 sec for Disconnector, Grounding Switch, CT & VT, as applicable), One and Half Breaker (I-type)…...	In GIS, there is no difference in layout arrangement for 1.5 CB scheme whether it is I-type or D-type. Please confirm.	Bidder to propose one & half CB scheme GIS layout which is well accomodated in the resective rating GIS building. Dimensions of buildings are given in enclosed Layout.
24	Annexure-BOQ: A.12 & A.13	SF6 gas required for placing GIS into successful operation - 20 MT Supply of structure material for installation of 400kV GIS including support structure for GIS ducts, SF6 to Air bushings, supports, platforms…..- 39MT	Every GIS manufacturer design require different quantity of SF6 gas and structure materials for the complete project. Hence we request you to kindly specify the SF6 gas and structure materials in one (1) LS /(1(one) Lot for each supplier's consideration. Please confirm.	Not accepted. Payment shall be made as per actual as per approved layout during detailed engineering stage in line with BOQ and technical specification.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL

NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023

Bidder 01

Sl. No.	Clause no./ Doc Reference	Technical Specification clause description	Deviations/ clarifications sought by bidders	Clarifications/ confirmations by BHEL/ Customer
25	Annexure-BOQ: A.15 & E.11	On-line continuous Partial discharge monitoring system(PDM) with all necessary accessories & auxiliaries) for 400kV & 220kV Gas insulated switchgear & Busducts (Make:Qualitrrol) 220kV GIS & Bus duct is in BHEL scope, however PD monitoring system shall be common for both 400kV & 220kV GIS. Erection, testing & commissioning of Online continuous Partial Discharge Monitoring System (PDM) common for both 400kV & 220kV GIS-Erection, testing & commissioning of complete Online continuous Partial Discharge Monitoring System (PDM) for both 400kV & 220kV GIS along with interfacing with SAS. To be done by OEM engineer.	We propose our own GE make of on-line PD monitoring system for 400kV. Please confirm. For 220kV, on-line PD monitoring system shall be excluded if GIS make differs from GE. Integration of 220kV GIS UHF Sensors with 400kV PDMS is also excluded.	Not accepted. Please comply BOQ and technical specification.
26	Annexure-BOQ: C.10	SF6 to Air bushing as applicable for 400kV GIS - 1No.	1 No. Single phase SF6 to Air bushing shall be offered as spare.	Noted.
27	Annexure-BOQ: D	Supply-operation and maintenance spares for 400kV GIS - 1 Lot = complete requirement for two years of normal operation and maintenance from the date of commissioning	As mandatory spares in item no. C is more than sufficient, we do not recommend any other spares as maintenance spares.	Noted, however, it shall be finalized during detailed engineering stage. Any requirement during detailed engineering stage shall be provided free of cost.
28	Annexure-BOQ: G.5	Surge arrester including surge counter - 1 set	Unit price for one no. single phase surge arrester including surge counter shall be considered for this item.	Noted.
29	Section-2: **CAST-ALUMINIUM**	Internal Surfaces (Cast-aluminium): Seevenax protective paint RAL 7038 (grey) External surfaces: ,material description; high resistant 2-component polyurethane paint shade: RAL 9010	Please note that as per type tested design, GIS enclosures internal surfaces are not painted. External surfaces are painted with stamdard paint shade RAL 7032.	For Internal surfaces - Noted, however, it shall be finalized during detailed engineering stage. For External surfaces - Please comply technical specification.
30	Section-2: 1.0, 2.0	The Bus of the 400kV, 220 KV, 132kV & 33 KV GIS System shall be of Aluminum of adequate size and should be capable of withstanding the short circuit current level of 63kA, 50kA, 40 KA & 31.5 KA respectively for 3 sec. Rated short circuit breaking current - 50-63kA	As per GIS-BOQ given, 400kV GIS system short circuit current is 63k for (3 sec for BB & CB) and 63kA/(1 sec for disconnector, Grounding Switch, CT & VT as applicable)	Noted.
31	Section-2: 3.1.3	…one of the adjacent enclosures at three times operating gas pressure and the other at atmospheric pressure for five minutes. Its safety factor shall be no less than 4.5. all insulators are free of partial discharge at a voltage which is at least 10% higher than the rated voltage.	Pressure test on partitions shall be as per IEC 62271-203, clause 6.104 We comply PD at voltage which is atleast 10% higher than rated voltage as per IEC 62271-203; Table-6.	Noted, however, it shall be finalized during detailed engineering stage.
32	Section-2: 3.1.4	Maximum water content of SF6 -gas in GIS, within guarantee period: CB ≤ 150 PPM (volume) Others ≤ 500 PPM (volume)	Maximum water content of SF6 gas in GIS shall be as per IEC 60480, Table-2.	Noted, however, it shall be finalized during detailed engineering stage.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL

NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023

Bidder 01

Sl. No.	Clause no./ Doc Reference	Technical Specification clause description	Deviations/ clarifications sought by bidders	Clarifications/ confirmations by BHEL/ Customer
33	Section-2: 3.1.22, 3.2.12, 3.2.21 & 3.2.22	Tools	Tools list given in the specification in different clauses(3.1.22,3.2.12,3.2.21,3.2.22). We quote tools as per BOQ item no. B1 to B10.	Noted. Please comply BOQ and technical specification.
34	Section-2: 3.2.13 & 3.2.22	Spares	Spares list given in the specification in two clauses(3.2.13,3.2.22).We quote spares as per BOQ item no. C.1 to C.25.	Noted. Please comply BOQ and technical specification.
35	Section-2: 3.2.3 2)	Maintenance earthing swtich: For 400kV : Power frequenty - 815 kVrms	Given PF withstand values are for across the isolating distance of the equipment. The values between phase to earth shall be: For 400kV: Power Frequency - 650 kVrms	Noted, however, it shall be finalized during detailed engineering stage.
36	Section-2: 3.2.6.2	However, there must have possibility of provision of CT on either side of CB.	For double bus bar scheme, all 5 cores shall be accommodated in a single CT, which is positioned after circuit breaker for each feeder bays.	Noted, however, it shall be finalized during detailed engineering stage.
37	Section-2: 3.2.8	SA will be applicable if recommended by OEM during detailed Engg. Bidder to submit the insulation co-ordination studies.	In the present scope, we have not included SAs inside GIS. To be operated with unit price provided during execution if required. For Insulation co-ordination studies, necessary inputs to be provided by BHEL on time.	Noted, however, it shall be finalized during detailed engineering stage.
38	Section-2: 3.2.9	SF6/Air bushings : 420kV -Rated current (Amp) - 2000/3150/5000 as applicable.	Rated current : Shall be 3150 Amps as per BOQ /SLD.	Noted.
39	Section-2: 3.2.11	Local Control Cubicle: - discrepancy type control switches for breaker, disconnector and earthing switch	We offer spring return type on/off selector switch for breaker,disconnector and earthswitch.	Noted, however, it shall be finalized during detailed engineering stage.
40	Section-2: 3.2.16	The wiring must be carried out with stranded copper conductors of at least 7 strands. The size of the conductors shall be suitable enough for the expected usage, but it must not be less than 2.5 sq.mm.	All control cable inside LCC shall be 1.5 sq.mm except VT and CT circuit.	Noted, however, it shall be finalized during detailed engineering stage.
41	Section-2: 3.2.21 2)	GIS testing equipment(Bidder should include all such testing equipment, which are required for testing of GIS system) - 1 set	HV test kit for testing GIS shall be provided on rental basis during GIS erection by GIS manufacturers and taken back after testing from site.	Noted.
42	Section-2: 3.2.21	Accessories and Testing Equipment	Supply tools and testing equipment shall be as per BOQ item no. B1-B10.	Noted. Please comply BOQ and technical specification.
43	Section-2: 3.2.22	Schedule of Essential tools and spares	Spares shall be as per BOQ item no. C1-C25.	Noted. Please comply BOQ and technical specification.
44	PDMS	Partial Discharge Monitoring system	We propose our own make of PD monitoring system for our GIS. Same will not supplied for 220kV GIS of other make. Hence PDMS for 220kV GIS is excluded.	Not accepted. Please comply BOQ and technical specification.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL

NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023

Bidder 01

Sl. No.	Clause no./ Doc Reference	Technical Specification clause description	Deviations/ clarifications sought by bidders	Clarifications/ confirmations by BHEL/ Customer
45	PDMS: (A).2	The PD couplers shall be of passive, maintenance free antenna type meeting CIGRE TF15/33.03.05 standards with detection spectra range: 250 MHz to 1.5 GHz.	UHF couplers shall be capable for measuring PD in charged GIS environment as EHV which shall have bandwidth in order of 100 MHz–2GHz with possibility to select a wide range of intermediate bandwidths for best measurement results. (Request to note that PD frequency range for portable PD tool and on-line PD monitoring system shall be same)	Please comply BOQ and technical specification.
46	PDMS: (A).3	Multiple UHF channels (on the GIS & its associated GIB ducts and Voltage transformers adopting UHF technique) shall be monitored contiuously and simultaneously to ensure no PD pulses are missed.	Offered PD system can monitor continously one after other and ensures no PD pulses are missed.	Please comply BOQ and technical specification.
47	PDMS: (A).4	System shall record switching transient generated by CBs and disconnectors. (optional analysis of switching patterns)	Switching transients are not captured and recorded as there is no Current transformer in PD system. Please note that this shall be part of CRP (Event logging and Data logging features).	Noted, however, it shall be finalized during detailed engineering stage.
48	PDMS: (B)	Portable Partial discharges (PD) monitoring system (shall generally applicable for 220kV & 132kV)	NA for 400kV GIS. Hence not required to quote.	Portable PD monitoring is not in scope of bidder. For both 400kV & 220kV rating GIS, common Online PD monitoring system is to be supplied which is covered in BOQ item sl. No. A15.
49	PDMS: (B).7.e)	7 e) Evaluation of bouncing/loose particles with flight time and estimation on size of particle.	If portable tool is included in BOQ, kindly note: Software provided analyzes the PD occurrences. It is not designed to estimate the size of the bouncing /loose particles.	Portable PD monitoring is not in scope of bidder. For both 400kV & 220kV rating GIS, common Online PD monitoring system is to be supplied which is covered in BOQ item sl. No. A15.
50	General	CB with PIR	SLD and BOQ is not calling for CBs with PIR. We have not considered PIR for any CBs.	Noted in line with BOQ and technical specification.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 02				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
1	Section-2: Internal surfaces (cast-aluminium):	Seevenax paint RAL 7038 (grey)	We would like to inform that the interior surface of the metal clad enclosures will not be having any paint shade. Kindly accept.	Noted, however, it shall be finalized during detailed engineering stage.
2	Section-2: External surfaces: material	2-component polyurethane paint RAL 9010 (white)	We would like to inform you that the Offered GIS will be supplied in our standard paint shade (Indoor RAL 7035). Hope the same be acceptable.	Please comply technical specification.
3	Section-2: 1.0 (C) Auxiliary system	(C) Following auxiliary also to be supplied.	Please note that equipment such as ACDB, Fire smoke detection facilities, Station Batteries, PLCC Battery, Power cables etc shall not be in our scope.	Noted, however any requirement specifically mentioned elsewhere in BOQ & TS will be part of bidder's scope. Cabling till LCC is in bidder's scope.
4	Section-2: 3.1 General	The switchgear shall be modular in design. Future extensions shall be by adding extra feeders without any major parts of the equipment.	We understand that future extension is on the right hand side only (after the disconnector, please clarify)	Noted, however, it shall be finalized during detailed engineering stage.
5	Section-1: Clause 3, Note 8	Any change in bay pitch (distance between bays): In a case where shifting of GIS bays shall be called for by BHEL (during contract stage) due to layout requirement /cost optimization/ revision / change in civil architectural requirement or due to expansion joint requirement in the GIS building, Bidder to incorporate the same with full compliance of technical requirement. Payment equivalent under the relevant item of BPS / BOQ item shall be operated for additional length of Main Bus, subject to such shifting is not attributed to bidder	Confirmed, however any change in length of busduct and bus bar shall be compensated as per unit rate defined in respective line item in Price Bid.	Noted. Payment shall be made as per actual as per approved layout during detailed engineering stage in line with BOQ and technical specification.
6	Section-1: Clause 3, Note 3	Bidder shall offer their latest type tested compact model to accommodate in the specified & allocated space. In case, bidder fails to meet above requirement, its technical offer is liable for non-evaluation.	Request to confirm the alloted space in which the GIS is to be offered. Pls share the autocad drawing for the substation area for confirmation.	Autocad drawings are attached. Bidders are requested to propose the suitable column locations.

PRE BID CLARIFICATIONS

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Bidder 02				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
7	Section-1: Clause 3, Note 4	Bidder shall conduct insulation co-ordination & very fast transient overvoltage (VFTO) studies in line with IEC 60071 for establishing suitability of surge arrester rating, and any other technical requirement for successful operation of GIS. Prices if VFTO study shall be included in the price quoted for Insulation Co-ordination Study.	Currently we have not considered any surge arrestor. Any requirement of SA shall be compensated at actual during execution. we understand that the SA is outdoor AIS type, hence not in our scope We shall not be conducting VFTO and insulation coordination study.	Not accepted. Please comply BOQ and technical specification.
8	Section-2: 3.2.1 C2 Class	The Circuit breaker shall be C2 class type and 400 kV, 'k' should be 1.4 times.	Please note that the circuit breaker is with C2 class endurance, however we request you to clarify the "k" requirement.	Noted, however, it shall be finalized during detailed engineering stage.
9	Section-2: 3.2.1	Arrangement of CB	As per prevailing practice in Indian market, in view of challenges and complexities pertaining to repair/replacement, maintanance and future extension of Vertical design Circuit breaker, we understand that the requirement for 400 kV GIS is for horizontal circuit breaker only. Pls confirm.	Proposed GIS and its layout is to be well accomodated in resective GIS building and its terminal points.
10	Section-2: 3.2.6. Position of the Current Transformers and Ratios and Characteristics.	there must be possibility to have provision of CT on either side of CB	We understand as per SLD that in tie feeder, the CT is duly distributed. if during execution, other feeders also need duly distributed CT, there will be suitable price implication for it	**Not accepted.** Please comply BOQ and technical specification.
11	Section-2: 3.2.8 SURGE ARRESTERS	Surge Arrestors	As per SLD, we understand that the SA is outdoor AIS type, hence not in our scope	**Not accepted**. Please comply BOQ and technical specification.
12	Section-2: 3.2.11 LCC	The LCC shall be factory tested and shipped with the bay as one transport unit	The same is not feasible for transportation in this way, hence both LCC and Bay shall be shipped as separate units.	**Not accepted.** Please comply BOQ and technical specification.
14	Section-2: 3.2.16	Space Heaters: In each box and local control cubicle a space heater is to prevent condensation. It should be connected by the same separate AC. circuit as above. The manufacturer shall indicate the electrical power of each heater,	We wish to inform that offered drive in CB/DS/ES is having continuous heater design and does not required any kind of thermostat. Same is as per type tested design.	Noted, however, it shall be finalized during detailed engineering stage.

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Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 02				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
15	Section-2: 3.2.18: ACCESSORIES:	SF6 GAS SERVICE CART (a) SF6 HANDLING PLANT	Please note the SF6 gas handling plant and service cart shall be in EPC scope	Not accepted. Gas handling plant as mentioned in BOQ item sl. No. B7 to be quoted
16	Section-2: 3.2.19	EQUIPOTENTIAL EARTH MAT:	Please note that the same shall be in customer's scope . We can support with the reference design.	Not accepted. BHEL will provide only 40mm dia MS rod, 75x10 & 50x6 GI flats as free issue items. Any other earthing requirement to meet the TS requirement will be part of bidder's scope and will be covered under BOQ item sl. No. A14.
17	Section-2: 3.2.20	B. Current transformer; C. Voltage Transformer; D. Busbar, E GIB	We would like to inform that, Routine test reports shall be submitted for customer's review during FAT for all bought out items. Kindly Accept.	Not accepted. Please comply BOQ and technical specification.
18	Section-3: Annexure-A, Clause 6	MARSHALLING KIOSKS AND CONTROL CABINETS	Please note that the bay marshalling box is not in our scope, we have considered Local control cubicles for the control and wiring termination of GIS	Noted.
19	General	Make and Model of equipment	We request to provide the project specific make and model of equipment if required	Bidder to supply the items of makes & models as specified in the BOQ & TS. For the items whose makes & models are not specifically mentioned in the TS/BOQ, make & model of those items will be finalised by customer during detailed engineering.
20	Section-1: Clause 3, Note 22	Ersama project shall have separate 400kV & 220kV GIS. Only 400kV GIS shall be in bidder's scope and 220kV shall be supplied by BHEL/ other vendor. Both GIS will be indoor type and will be housed in separate GIS buildings. However, complete supply & installation of Online Partial Discharge Monitoring System (PDM) for both ratings of GIS (i.e. for both 400kV & 220kV GIS) is in bidder's scope. Location of PD sensors & their supply will be in individual GIS vendor's scope. However, any other item/ equipment/ panel/ cable/ connector/ coupler / PC etc. required for complete interfacing of PD monitoring system with both 400kV & 220kV GIS and BHEL supplied SAS will be in scope of bidder.	We request you to separate the scope of 400kV and 220kV PD monitoring system as the integration between the system of both scope will be diffuclt for the vendor. We suggest that the scope of GIS OEM be limited to the supply of GIS with PD Sensors and the monitoring system be arranged by BHEL	**Not accepted.** Please comply BOQ and technical specification.

PRE BID CLARIFICATIONS

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Bidder 03				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
1	Section-2:	Paint requirement RAL 7038 (grey)	We would like to inform you that we shall provide the RAL 7032 grade paint. Please accept the same.	For Internal surfaces - Noted, however, it shall be finalized during detailed engineering stage. For External surfaces - Please comply technical specification.
2	-	Online PDM	We would like to inform that in BOQ is not mentioned but in TS document Online PDM requirement is mentioned for both GIS in One Online PDM system. Please clarify Onine PDM requirement.	Online PD Monitoring system requirement common for both 400kV & 220kV GIS is mentioned in BOQ item sl. No. A15. Complete system to be supplied by bidder as per BOQ and technical specification.
3	-	Earthing Materials & Anchor bolts	We would liketo inform that we shall provide support structure, remaining earthing and anchor bolts supply will be EPC scope. Please accept the same.	Please comply BOQ and technical specification.
4	-	Special Tools List	We would like to inform that in BOQ special tools is not mentioned, in TS documents special tools is mentioned not applicable for 220kV GIS. So we are not considering the special tools for 220kV GIS, we considered only for 400kV GIS. Please clarify the same.	Please comply BOQ and technical specification.
5	-	Spare parts list	We would like to inform that as per BOQ we considered the spare parts list. Please confirm the same.	Please comply BOQ and technical specification.
6	Section-2: caluse 13.1 Page No: 117	CB Indication The breaker shall be provided with `OPEN'. `CLOSE', `SERVICE', `TEST' and `SPRING CHARGED' position indicators and shall be provided with the necessary number of auxiliary contacts for interlocking, indication and tripping purposes plus two spare	We would like to inform we shall provide 'OPEN', 'CLOSE', 'SPRING CHARGED' indication in CB compartment.'SERVICE' & 'TEST' indication will not provide in GIS CB marshling box. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
7	Page no: 36	SLD & Layout Identification	We would like to inform that we shall consider the Bay identification and GIB direction will be as per Over all Layout mentioned in TS. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
8	-	400kV-TIE bay quantity	We would like to inform that Tie Bay quantity is discripency as per BOQ and SLD in TS document. Please clarify the same.	Noted. Three Sets of TIE bays are to be supplied as per the BOQ item sl. No. A4
9	-	Inspection Window for DS/ES Contacts. To meet safety requirement, Disconnector-Maintenance E/S compartment should have minimum 75mm window to check position of Maintenance ES Contacts.	We would like to inform that, as per our design 70mm for view point. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.

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Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
10	-	The Power frequency withstand voltage at site shall be 80% of the factory test voltage for 1 minute at 50Hz.	We would like to inform you that as per IEC62271-203, Power frequency withstand test onsite can perform 10-300Hz. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
11	Page No: 82 of 152	**Online PDM-**	We would like to inform you that as per our model Online PDM system we shall provide the continous monitor and only alarm signal can provide by our Online PDM system from potential free contact. Please accept the same.	Not accepted. Make of Online PD monitoring is mentioned in the specification. Please comply BOQ and technical specification.
11a	Page No: 82 of 152	**Online PDM-**	We would like to inform you that as per BOQ we understand that online PDM required for 400 & 220kV GIS on same package and Make should be 'QUALITROL'. We shall provide HYOSUNG make OPDMS. Please accept the same.	Not accepted. Please comply BOQ and technical specification.
12	Page No: 82 of 152	220kV & 400kV On Single online PDM system	We would like to inform that we shall provide the separate online PDM system for 220kV and 400kV GIS. But as per you TS only for 400kV Online PDM is required and for 220kV Portable PDM kit is required but in BOQ for 220kV Special tools is mentioned not applicable. Please accept the same.	Not accepted. Portable PD monitoring is not in scope of bidder. For both 400kV & 220kV rating GIS, common Online PD monitoring system is to be supplied which is covered in BOQ item sl. No. A15.
13	-	Surge Arrester	We would like to inform that During Detailed Engineering period any LA will consider in GIS that will applicable on extra cost. Please accept the same.	Noted. Please comply BOQ and technical specification.
14	-	Future extension of GIS for 220kV & 400kV	We would like to inform that we shall consider the future extension of 220kV and 400kV on right side of GIS building side as per Layout requirement. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
15	-	Type test for Earth quake test.	We would like to inform that as per iec its not specified. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
16	-	Humidity-100 %	We would like to inform that as per iecour type tested till 95 %, as per IEC 62271-203 GIS should be till 95% for Indoor type GIS. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 03				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
17	General	Pre-fabricated cable from GIS to LCC panel.	We would like to inform you that, as per standard practice all control cables from GIS to LCC panel will be lay in site and termination will be done in site for both End's, Please accept the same.	Noted. Please comply BOQ and technical specification.
18	General	-	We would like to inform you that as per our Load control cable is more sufficient of 1.5sq.mm and CT&VT cables will be 2.5sq.mm. Please accept the same.	Noted, however, it shall be finalized during detailed engineering stage.
19	General	Online SF6 gas monitor system	We would like to inform you that as per TS we understannd that you required online sf6 gas monitor system. Please clarify that only GD alarm required to SCADA or GD density values in SCADA system and also if required MODBUS model or converter model.	Please comply BOQ and technical specification. All necessary provisions & hardware such as patch cord, FO cable, ethernet switches, LIU etc. required for interfacing of gas density monitoring system with SAS on IEC 61850 protocol (upto LCC/ interfacing panel in GIS hall) shall be part of bidder's scope.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 04				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
1		LAYOUT PLAN & SECTION OF 400/220KV GIS 400kV GIS Configuration	We understand the Configuration indicated in the tender drawing is indicative and I Type layout shall be accepted. Kindly confirm	Proposed GIS layout is to be well accomodated in resective GIS building. CAD drawing attached for reference.
		Technical Qualifying Requirements for 400kV Gas Insulated Switchgear (GIS)		
2	PQR Point III	III. The bidder/ GIS manufacturer shall have to furnish type test report of SF6 gas insulated sub-station equipment duly designed, manufactured, tested (as per IEC standard) which, shall not be older than Ten (10) years, as on date of bid opening (i.e. 11.02.2022). The Type Test Reports shall be of the Same type and model of GIS equipment as offered for the project (i.e. 400 KV & 63KA rating).	As per latest CEA Guidelines, Type test validity has been revised to 15 years. Request to kindly provide a concurence on the same	Noted, however, it shall be finalized during detailed engineering stage.
3	PQR Point IV	IV. TypeTest should have been preferably conducted at any of the following internationally reputed testing laboratories like (a) KEMA (Holland) (b) CESI (Italy) (c) CERDA (France) (d) PHELA (Germany) (e) KERI (South Korea) (f) CPRI (India) (g) ERDA (India) (h) JSTC (Japan) (i) Intertek (ASTA), U.K for STL (j) VEIKI, (Hungary).	Request to kindly add TUV and ASTA INTERTEK to this list	Noted, however, it shall be finalized during detailed engineering stage.
4	Section 1, 6	6. Bidder shall submit 3D model (surface model/ light weight model) compatible with primtech/ any other 3D software for complete GIS and its accessories.	The specific models are governed under Intellectual property rights, submitting of the same is not envisaged	**Not accepted**. Please comply BOQ and technical specification.
5	Section 1, 12	12. Fixing and erection of GIB duct on GIB cum cable gallery floor including foundation/ fixing bolts/ embedded plate shall be in bidder scope of supply.	Kindly share the Dimensioned AUTOCAD copy of the GA layout and the Section drawings for the 400kV GIS requirement. Also request to share the details for Expansion joints location and Power trafo terminal locations	Noted. Autocad drawings are also attached. Bidders are requested to propose the suitable column locations.
6	Section 1, 21	Each end of the main bus bars of GIS shall be designed for convenient future extension of the switchgear and related technical details shall be provided by bidder to meet the requirements of other make /GIS supplier.	The extension provision will be considered on both sides in line with the BOQ requirement, however it is observed that there exists no additional space in the GIS hall for future extensions. Request a confirmation on the requirements	Please comply BOQ and technical specification, however, it shall be finalized during detailed engineering stage.
7	Section 1, 22	22. Ersama project shall have separate 400kV & 220kV GIS. Only 400kV GIS shall be in bidder's scope and 220kV shall be supplied by BHEL/ other vendor. Both GIS will be indoor type and will be housed in separate GIS buildings. However, complete supply & installation of Online Partial Discharge Monitoring System (PDM) for both ratings of GIS (i.e. for both 400kV & 220kV GIS) is in bidder's scope. Location of PD sensors & their supply will be in individual GIS vendor's scope. However, any other item/ equipment/ panel/ cable/ connector/ coupler / PC etc. required for complete interfacing of PD monitoring system with both 400kV & 220kV GIS and BHEL supplied SAS will be in scope of bidder.	We understand that 220kV and 400kV GIS packages are different, thus the PD monitoring systems for these will also be considered seperately. Kindly confirm	Not accepted. Please comply BOQ and technical specification.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 04				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
8	Section 1, 6	□ HV test kit required for HV testing and partial discharge measurement shall be provided with operator along with valid calibration certificate by bidder on returnable basis. HV test kit may be brought at site multiple times as per site requirements,	HV test kit shall be provided to site for one instance only after the completion of erection before the initiation of Final testing	Not accepted. Please comply BOQ and technical specification.
9	Section 1, 8	□ It is to be noted that earthing riser shall be copper flat size of 50x6mm with bi-metallic arrangement to connect from ground earth mat to enclosure of GIS equipment.	Supply of risers shall be excluded from Siemens Ltd scope	BHEL will provide only 40mm dia MS rod, 75x10 & 50x6 GI flats as free issue items. Any other earthing requirement to meet the TS requirement will be part of bidder's scope and will be covered under BOQ item sl. No. A14. Please comply BOQ and technical specification.
10	Section 1, 14	14. No support structure shall be placed within 2 meters around the GIS building periphery.	Kindly share the AUTOCAD copy of the GA layout for a check and confirmation	Noted. Autocad drawings are also attached. Bidders are requested to propose the suitable column locations.
11	Section 1, 7	The validity of type test reports shall be as per the latest CEA guidelines (amended time to time) as on the original scheduled date bid submission for BHEL tender (i.e. 11.02.2022) In case, where type test certificates are older than period as per latest CEA guidelines (amended time to time), bidder/ manufacturer shall carry out the type tests prior to dispatch of equipment without any commercial implication on BHEL/ OPTCL. Further, in case, any type tests, which has not been	As per latest CEA Guidelines, Type test validity has been revised to 15 years. Request to kindly provide a concurence on the same	Noted, however, it shall be finalized during detailed engineering stage.
12	Section 1, 11	4. The equipment may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains and high ambient temperature. Hence, packing of the equipment shall be suitable for long storage (minimumyears).	We recommend that all material be stored in covered , dry area and elevated areas. Any storage exposed to direct water, submerged in water is not recommended. The copy of storage guidelines is enclosed.	Noted, however, it shall be finalized during detailed engineering stage.
13	Section 1, 9	The bus enclosure shall be sectionalized in a manner that maintenance work on any bus disconnector (when bus and bus disconnector are enclosed in a single enclosure) can be carried out by isolating and evacuating the small effected section and not the entire bus.	Not Applicable to offered GIS design	Noted, however, it shall be finalized during detailed engineering stage.
14	7. Type Testing	s) Earthquake withstand test	Not Applicable to GIS, Necessary calculations for Seismic details shall be shared during detail Engineering	Noted, however, it shall be finalized during detailed engineering stage.
15	Section 1, Annexure-BOQ A Supply- GIS: 400kV, 63kA, 3150A GIS	The 400 KV, 3150A, 63kA for (3 sec for Bus Bar & CB) & 63kA for (1 sec for Disconnector, Grounding Switch, CT & VT, as applicable), One and Half Breaker (I-type) GIS complete with local control centre (LCC) etc with open future proof & flexible system in line with IEC 61850 & IEC 62271-203. (Circuit breaker shall be C2 - M2 class as per IEC 62271-100).	We understand the Configuration indicated in the tender drawing is indicative and I Type layout shall be accepted. Kindly confirm	Proposed GIS layout is to be well accomodated in resective GIS building.
16	Section 1, Annexure-BOQ Item A	400kV, 3150A, 63kA (3 sec for CB & 1 sec for Disconnector, Grounding Switch, CT, VT as applicable	We understand that line/trafo/reactor bay VT is not applicable for 400kV GIS bays, kindly confirm	Please comply BOQ and technical specification.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 04				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
17	Section 1, Annexure-BOQ Item A	400kV, 3150A, 63kA (3 sec for CB & 1 sec for Disconnector, Grounding Switch, CT, VT as applicable	Kindly confirm the requirement of PIR for the GIS Bays	Please comply BOQ and technical specification.
18	Section 1, Annexure-BOQ Item A	Infra red camera	Kindly share the technical specifications for this requirement	Please comply BOQ and technical specification. It shall be of reputed make and model.
19	Section 2 STANDARD SPECIFICATIONS	Sectionalizing shall ensure that Circuit breaker enclosure shall not have any other critical switching/non-switching component within same circuit breaker compartment for example current transformer, earth switch, dis-connector etc.	For the offered 400kV GIS that meets all the requirement of service continuity in line with IEC 62271-203 the Circuit breaker compartment also consists of Earth switch, this design does not have any effect on the overall repair/maintainance or Service level requirement. We request to kindly review and accept this design	Noted, however, it shall be finalized during detailed engineering stage.
20	Section 2 3.1.1 SECTIONALIZATION	Barrier insular should be used for creating adequte gas segregation over the bus bar length. The length of the bus bar compartments shall be such that the gas handling / quantity in an individual BUSBAR COMPARTMENT shall be limited to 100 kg.	The Offered GIS Busbar design is passive non gas segregated type that meets all the specific requirements of service continuity. The requirement of lower period of gas handling can also be met using the gas handling plant being supplied. We request a confirmation on the offered GIS busbar design	Noted, however, it shall be finalized during detailed engineering stage.
21	Section 2 3.1.6 GAS FILTERS / TREATMENT	It shall be possible to replace the active material of the filter without extensive dismantling.	The filter is provided in dessicant bags that are replaced only when the modules are opend for maintainance and repair. Only active material replacement is never envisaged.	Noted, however, it shall be finalized during detailed engineering stage.
22	Section 2 3.1.8 GAS MONITORING DEVICES	SF6 gas shall be monitored with suitable gas density monitors, temperature and pressure switches with a facility to transmit the status through 4-20mA or MODBUS to SCADA. All the contacts shall be wired to SCADA through common GIS controller.	We infer that the signals from the Gas density monitors shall be routed to the CRP/SCADA, the necessary cables for which shall be supplied by BHEL	Noted, however, all necessary provisions & hardware such as patch cord, FO cable, ethernet switches, LIU etc. required for interfacing of gas density monitoring system with SAS on IEC 61850 protocol (upto LCC/ interfacing panel in GIS hall) shall be part of bidder's scope.
23	Section 2 3.1 .20 EARTHING OF THE SWITCHGEAR	A minimum of two nos. of grounding connections should be provided for each of circuit breaker, cable terminals, surge arrestors, earth switches and at each end of the bus bars.	As the GIS design is a dead tank type design, the enclosure is completely grounded, thus the interconnection to ground risers shall follow standard manufacturers practice	Please comply BOQ and technical specification.
24	Section 2 3.2.3 MAINTENANCE EARTHING SWITCH	The common point of the two bus bars along with earth switch shall be designed and housed in a single compartment so as to avoid complete shutdown of the system in case of maintenance required in any disconnector	The requirement of service continuity and repair/maintainance shall be met with Siemens Standard Type tested design. Request a concurrence on the same	Noted, however, it shall be finalized during detailed engineering stage.

PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 04				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
25	Section 2 3.2.5.1	Compartment arrangement at the end of main bus bar shall be such that simultaneous shutdown of both main bus bars is not required during future extension job. For the above purpose suitable arrangements with disconnector with earth switch on each bus bar with suitable Gas Tight Spacers / compartments shall be provided at each end where the Extension is foreseen in the Tender SLD. in case there is no indication of the Future extension, then the bidder is requested to get necessary confirmation at the time of bidding, prior to bid submission. Gas Line Diagram showing the procedure of bay extension as described above shall be submitted along with the bid by the bidder.	Provision of Future extension link shall be provided on the main busbar to meet the necessary future extension requirement. Request a confirmation on the same	Please comply BOQ and technical specification.
26	Section 2 3.2.8.1	Buffer Compartment between Bay to Bay & between Main Bus-bar to Circuit Breaker:	Provision of buffer compartement is not envisaged for 400kV and 220kV GIS, the requirements of service continuity/repair and maintainance shall be met using standard type tested design	Please comply BOQ and technical specification.
27	Section 2 3.2.19	The general earth mat design, the connection device and the bimetallic plate shall be supplied by the GIS manufacturer. The earth connection from earth pad of equipment to the general earth mat near shall be provided by the supplier.	Excluded from Siemens Ltd. Scope of supply	Not accepted. BHEL will provide only 40mm dia MS rod, 75x10 & 50x6 GI flats as free issue items. Any other earthing requirement to meet the TS requirement will be part of bidder's scope and will be covered under BOQ item sl. No. A14.
28	Section 3 3.1 PROJECT INFORMATION AND SYSTEM PARAMETERS	Phase to phase Clearance 4200 mm Phase to Earth Clearance 3500 mm Sectional Clearance 6500 mm	Not Applicable for offered 400kV GIS	Noted.
29	Section 3 3.2 INSTRUCTION TO BIDDERS:	The bidder shall supply type tested (including special tests as per tech. specification) equipment and materials. The test reports shall be furnished by the bidder along with equipment/ material drawings. In the event of any discrepancy in the test reports, (i.e., if any test report is not acceptable due to any design/manufacturing changes or due to non-compliance with the Technical Specification and/ or applicable standard), the tests shall be carried out without any additional cost implication to the BHEL. BHEL reserves the right to get any or all type/tests conducted/repeated.	As per latest CEA Guidelines, Type test validity has been revised to 15 years. Request to kindly provide a concurence on the same; No repetition of type tests is envisaged	Noted, however, it shall be finalized during detailed engineering stage.

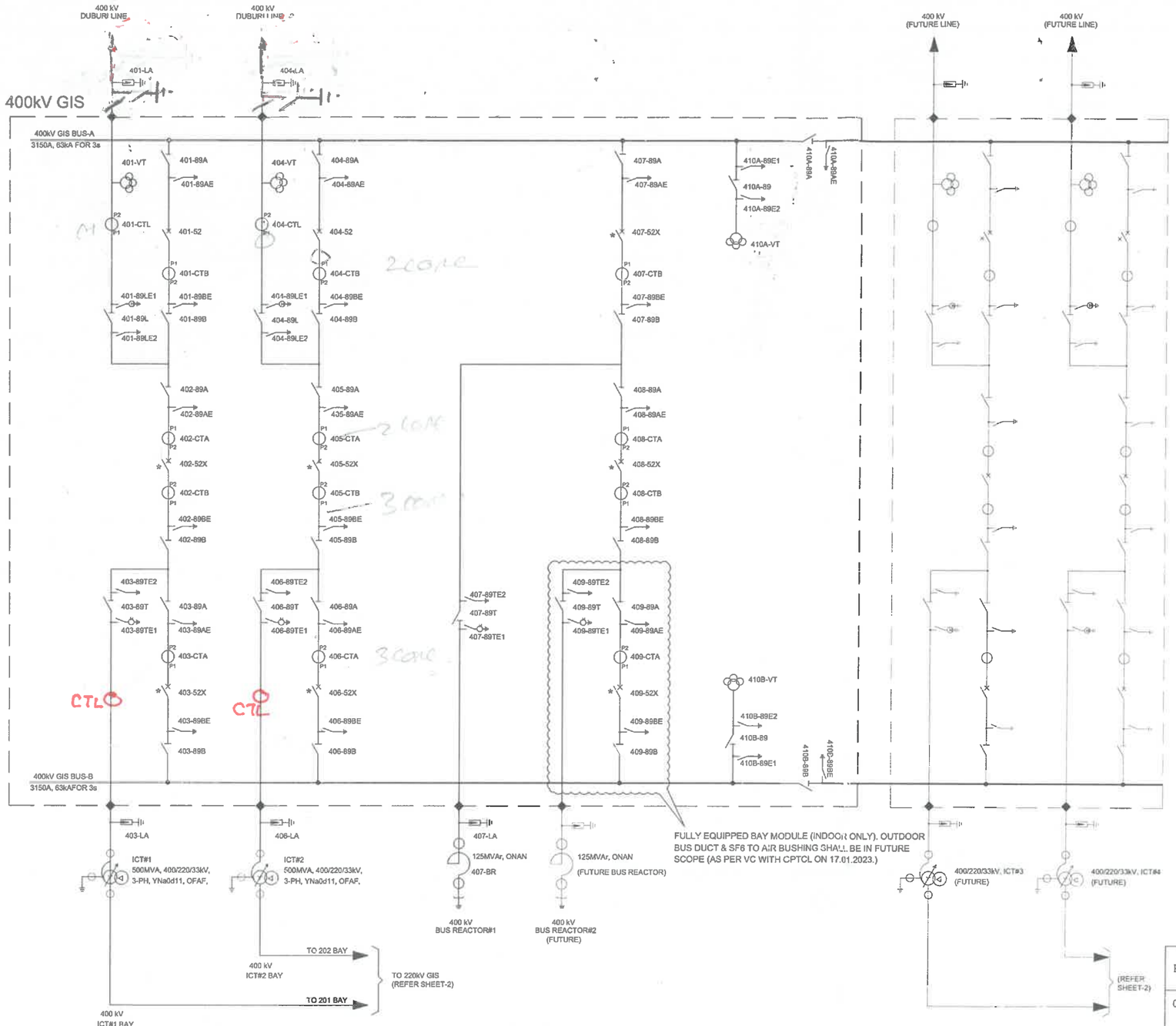
PRE BID CLARIFICATIONS

Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL				
NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023				
Bidder 04				
Sl. No.	**Clause no./ Doc Reference**	**Technical Specification clause description**	**Deviations/ clarifications sought by bidders**	**Clarifications/ confirmations by BHEL/ Customer**
30	Section 3 3.4 COLOUR SCHEME AND CODES FOR PIPE SERVICEIPANELS	All steel structures, plates etc. shall be painted with non-corrosive paint on a suitable primer. It may be noted that normally all Employer"s electrical equipment in Employer"s switchyard are painted with shade 631 of IS: 5 and Employer will prefer to follow the same for this project also. All indoor cubicles shall be of same colour scheme and for other miscellaneous items colour scheme will be subject to the approval of the BHEL/OPTCL.	The color of the finished coats inside shall be RAL 7035	For Internal surfaces - Noted, however, it shall be finalized during detailed engineering stage. For External surfaces - Please comply technical specification.
31	Section 3 3.15.2 Construction requirements	The cubicles and enclosures shall be of protection class IP 54	The cubicles and enclosures for offered GIS shall be IP 43	Noted, however, it shall be finalized during detailed engineering stage.
32	Section 3 3.21 ENCLOSURES:	1. MOTORS	Not Applicable for offered 400kV GIS	Noted
33	Section 3 3.21 ENCLOSURES:	3.0 TERMINAL BOARDS AND TERMINAL BLOCKS	Not Applicable for offered 400kV GIS	Noted
34	Section 3 12.0 BUSHINGS, HOLLOW COLUMN INSULATORS, SUPPORT INSULATORS	Support insulators, bushings and hollow column insulators shall be manufactured from high quality porcelain. Porcelain used shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might affect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.	Offered 400kV GIS Bushings shall be Polymeric type	Noted, however, it shall be finalized during detailed engineering stage.
35	Section 3 13.0 CIRCUIT BREAKERS	13.1 General	The specifications apply to AIS thus not considered applicable for offered 400kV GIS	Noted
36	Section 3 16.0 INSTRUMENT TRANSFORMERS	16.0 INSTRUMENT TRANSFORMERS	The specifications apply to AIS thus not considered applicable for offered 400kV GIS	Noted
37	Section 3 19.0 AIR BREAK SWITCHES	19.0 AIR BREAK SWITCHES	The specifications apply to AIS thus not considered applicable for offered 400kV GIS	Noted

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

EQUIPMENT DESIGNATION FOR SLD

4	01	–	89	A/B/L/T	E

EARTH SWITCH
A–EQUIPMENT CONNECTED ON BUS–1 SIDE
B–EQUIPMENT CONNECTED ON BUS–2 SIDE
L–DEVICE CONNECTED TO LINE SIDE
T–EQUIPMENT CONNECTED TO TRANSFORMER/REACTOR
EQUIPMENT IDENTIFICATION (ISOLATOR)
BAY NO. : 01,02.....n
VOLTAGE LEVEL – 400kV

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

COUNTERSIGNED
13/3/23
Deputy General Manager (EL.)
EHT Construction Circle
OPTCL, Bhubaneswar

NOTES :

1. PRESENT _____
   FUTURE _____
2. * - CB WITH CONTROLLED SWITCHING DEVICE SHALL BE PROVIDED IN 400kV ICT#1, ICT#2 & BUS REACTOR BAYS ALONG WITH THEIR ASSOCIATED TIE BAYS.
3. BAY SEQUENCE FOR GIS IS TENTATIVE & MAY CHANGE IN LINE WITH THE REQUIREMENTS OF SERVICE CONTINUITY AND STANDARD DESIGN OF OEM.
4. LOCATION OF GIS CT IN BAY MAY CHANGE AS PER THE RECOMMENDATIONS OF OEM.
5. INDIVIDUAL EQUIPMENT OF GIS OR AIS WILL BE PROVIDED AS PER REQUIREMENTS OF TECHNICAL SPECIFICATION & DEVIATIONS (IF ANY) FROM TECHNICAL SPECIFICATION WILL BE TAKEN UP SEPARATELY.
6. CT/VT PARAMETERS OF 400kV GIS ARE DETAILED IN SEPARATE SHEET OF THIS DRAWING. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.
7. 420KV 3150A, 63K isolator with one E/S to be provided in each line feeder.
8. CSD to be provided on both the 400KV line Bay.

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

		NAME	SIGN.	DATE	NO.OF VAR.
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA	DRN.	AK			N.A.
	CHD.	DKS			
	APPD.	VK			

DEPT. / CODE	UNTOL. DIMS. CR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
TBG	g/M/f	N.T.S	N.A.	N.A.	N.A.	N.A.

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA
OWNER:	ODISHA POWER TRANSMIISSION CORPORATION LIMITED

TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA

CARD CODE: NA

DRG.NO. TB-3-420-510-001 REV. 00

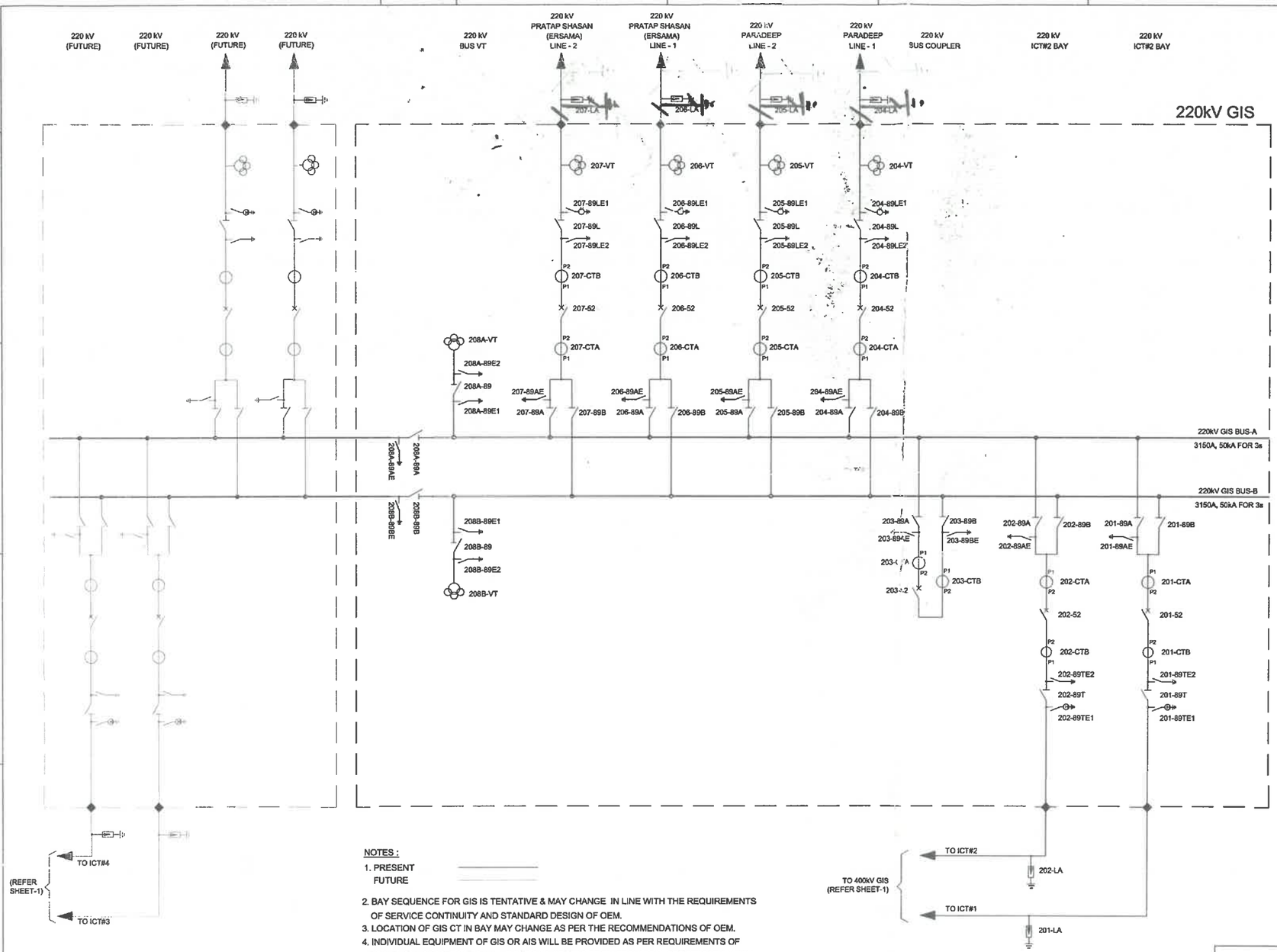
SHT. No 01 NO: OF SHT. 05

SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



NOTES :

1. PRESENT ——— FUTURE ———
2. BAY SEQUENCE FOR GIS IS TENTATIVE & MAY CHANGE IN LINE WITH THE REQUIREMENTS OF SERVICE CONTINUITY AND STANDARD DESIGN OF OEM.
3. LOCATION OF GIS CT IN BAY MAY CHANGE AS PER THE RECOMMENDATIONS OF OEM.
4. INDIVIDUAL EQUIPMENT OF GIS OR AIS WILL BE PROVIDED AS PER REQUIREMENTS OF TECHNICAL SPECIFICATION & DEVIATIONS (IF ANY) FROM TECHNICAL SPECIFICATION WILL BE TAKEN UP SEPARATELY.
5. CT/VT PARAMETERS OF 220kV GIS ARE DETAILED IN SEPARATE SHEET OF THIS DRAWING. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.
6. 245 KV 2000A 40 KA 5/1 with one E/S to be provided in each line feeder.

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

EQUIPMENT DESIGNATION FOR SLD

2	01	–	89	A/B/L/T	E

E – EARTH SWITCH
A – EQUIPMENT CONNECTED ON BUS–1 SIDE
B – EQUIPMENT CONNECTED ON BUS–2 SIDE
L – DEVICE CONNECTED TO LINE SIDE
T – EQUIPMENT CONNECTED TO TRANSFORMER/REACTOR
EQUIPMENT IDENTIFICATION (ISOLATOR)
BAY NO. : 01.02.....n
VOLTAGE LEVEL – 220kV

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

Manager(Elect.)
EHT (Const.) Circle,
QPTCL, Bhubaneswar

COUNTERSIGNED
13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA						
OWNER:	——— ODISHA POWER TRANSMIISSIION CORPORATION LIMITED						
BHEL	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.	
		DRN.	AK			N.A.	
		CHD.	DKS				
		APPD.	VK				
DEPT. TBG CODE	UNTOL. DIMS. GR. f/M/f		SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA		CARD CODE NA	DRG.NO. TB–3–420–510–001			REV. 00	
			SHT. No 02	NO. OF SHT. 05			

8 7 6 5 4 3 2 1 SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

A. 400kV GIS EQUIPMENT: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	400kV, 3150A, 63kA FOR 3 SEC, 3-PH CIRCUIT BREAKER		52	401, 404	SETS	02
2.	400kV, 3150A, 63kA FOR 3 SEC, 3-PH CIRCUIT BREAKER WITH CSD		52X	402, 403, 405, 406, 407, 408, 409	SETS	07
3.	400kV, 3150A, 63kA FOR 1 SEC, 3-PH DISCONNECTOR		89A 89B 89L 89T 89	401, 402, 403, 404, 405, 406, 407, 408, 409, 410A 401, 402, 403, 404, 405, 406, 407, 408, 409, 410B 401, 404 403, 406, 407, 409 410A, 410B	SETS	28
4.	EARTH SWITCH , 3-PH , GROUP OPERATED		89AE 89BE 89LE2 89TE2 89E1 89E2	401, 402, 403, 404, 405, 406, 407, 408, 409, 410A 401, 402, 403, 404, 405, 406, 407, 408, 409, 410B 401, 404 403, 406, 407, 409 410A, 410B 410A, 410B	SETS	30
5.	HIGH SPEED EARTHING SWITCH , 3-PH, GROUP OPERATED		89LE1 89TE1	401, 404 403, 406, 407, 409	SETS	06
6.	400kV, 3000A, 63kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (5-CORE)		CTA CTB	402, 403, 405, 406, 408, 409 401, 402, 404, 405, 407, 408	SETS	36
7.	400kV, 3000A, 63kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (2-CORE)		CTL	401, 404	SETS	06
8.	400kV, 1-PH, 3 SECONDARY VOLTAGE TRANSFORMER		VT	401, 404, 410A, 410B	SETS	12

B. 220 kV INDOOR GIS: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	220kV,3150A, 50kA FOR 3 SEC, 3-PH CIRCUIT BREAKER		52	201, 202, 203, 204, 205, 206, 207	SETS	07
2.	220kV,3150A, 50kA FOR 1 SEC, 3-PH GROUP OPERATED DISCONNECTOR		89 89A 89B 89L 89T	208A, 208B 201, 202, 203, 204, 205, 206, 207, 208A 201, 202, 203, 204, 205, 206, 207, 208B 204, 205, 206, 207 201, 202	SETS	24
3.	EARTH SWITCH , 3-PH , GROUP OPERATED		89AE 89BE 89LE2 89TE2 89E1 89E2	201, 202, 203, 204, 205, 206, 207, 208A 203, 208B 204, 205, 206, 207 201, 202 208A, 208B 208A, 208B	SETS	20
4.	HIGH SPEED EARTHING SWITCH , 3-PH, GROUP OPERATED		89TE1 89LE1	201, 202 204, 205, 206, 207	SETS	06
5.	220kV, 3000A, 50kA FOR 1 SEC, 1-PH,CURRENT TRANSFORMER (2-CORE)		CTA	201, 202, 203, 204, 205, 206, 207	SETS	21
6.	220kV, 3000A, 50kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (3-CORE)		CTB	201, 202, 203, 204, 205, 206, 207	SETS	21
7.	220kV, 1-PH, 3 SECONDARY VOLTAGE TRANSFORMER		VT	204, 205, 206, 207, 208A, 208B	SETS	18

C. OUTDOOR EQUIPMENT: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	500MVA, 400/220/33KV, YNa0d11,OFAF, 3-PH ICT		ICT	ICT#1, ICT#2	NOS	02
2.	400kV, 125MVA, 3-PH BUS REACTOR		BR	409	NOS	01
3.	390kV, 20kA, CLASS-IV, 63kA, 1-PH, SURGE ARRESTER		LA	401, 403, 404, 406, 409	NOS	15
4.	216kV, 10kA, CLASS-III, 50kA, 1-PH, SURGE ARRESTER		LA	201, 202, 204, 205, 206, 207	NOS	18
5.	400kV, 3150A, 63kA FOR 1 SEC. SF6 TO AIR BUSHING			401, 403, 404, 406, 407, 409	NOS	15
6.	220kV, 3150A, 50kA FOR 1 SEC. SF6 TO AIR BUSHING			201, 202, 204, 205, 206, 207	NOS	18

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

SYSTEM PARAMETERS: –

S.N.	SYSTEM PARAMETERS	400kV	220kV
1.	NOMINAL VOLTAGE	400kV	220kV
2.	HIGHEST SYSTEM VOLTAGE	420kV	245kV
3.	RATED FREQUENCY	50Hz	50Hz
4.	RATED SHORT TIME CURRENT	63kA for 3s/1s (as applicable)	50kA for 3s/1s (as applicable)
5.	POWER FREQUENCY WITHSTAND VOLTAGE	630kV (rms)	460Kv (rms)
6.	LIGHTNING IMPULSE WITHSTAND VOLTAGE	±1425 kV peak	±1050 kV peak
7.	SWITCHING IMPULSE WITHSTAND VOLTAGE	±1050 kV peak	N.A
8.	CREEPAGE	31mm/kV (13020mm)	31mm/kV (7595mm)
9.	GROUNDING	Effectively earthed	Effectively earthed

COUNTERSIGNED
13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

		NAME	SIGN.	DATE	NO.OF VAR.
BHEL	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA	DRN. AK			N.A.
		CHD. DKS			
		APPD. VK			

PROJECT: 400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA

OWNER: ODISHA POWER TRANSMIISSIION CORPORATION LIMITED

DEPT. TBG / CODE	UNTOL. DIMS. GR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
		N.T.S	N.A.	N.A.	N.A.	N.A.

TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA

CARD CODE: NA

DRG NO. TB-3-420-510-001 REV. 00

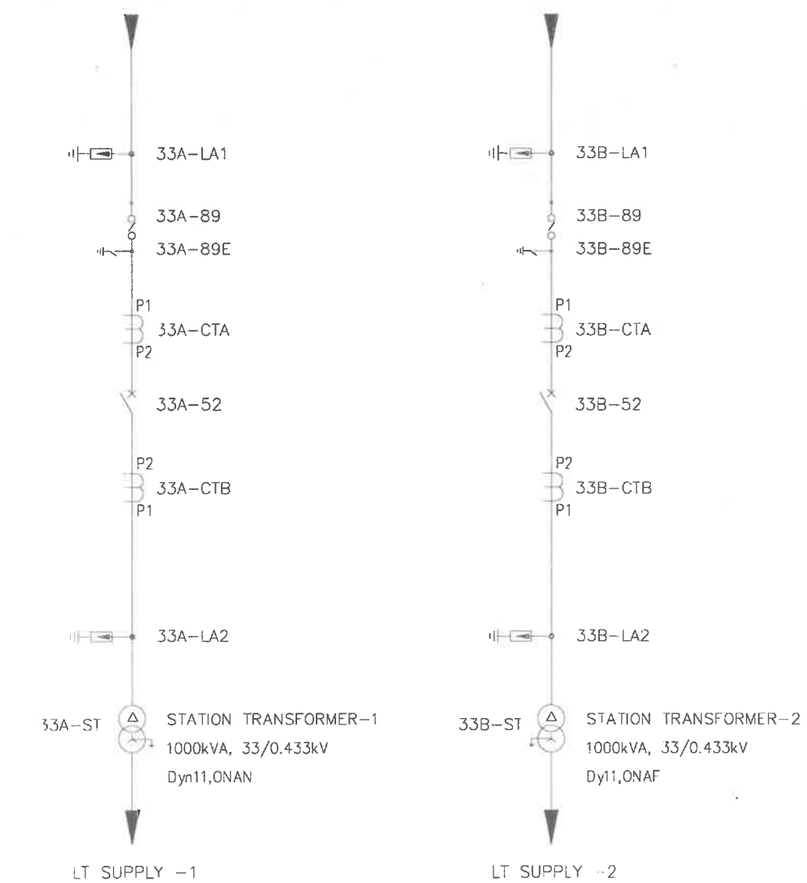
SHT. No 03 NO. OF SHT. 05

SIZE-A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



33kV SYSTEM PARAMETERS: –

S.N.	SYSTEM PARAMETERS	33kV
1.	NOMINAL VOLTAGE	33kV ≫52KV
2.	HIGHEST SYSTEM VOLTAGE	36kV ≫52KV
3.	RATED FREQUENCY	50Hz
4.	RATED SHORT TIME CURRENT	31.5kA for 3s/1s (as applicable)
5.	POWER FREQUENCY WITHSTAND VOLTAGE	70kV (rms) 95KV(rms)
6.	LIGHTNING IMPULSE WITHSTAND VOLTAGE	±170 kV peak 250KVpeak
7.	CREEPAGE	31mm/kV (1116mm) 1612mm).
8.	GROUNDING	Effectively earthed

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, SSSR

BILL OF QTY. FOR 33kV OUTDOOR EQUIPMENT:

SL.NO.	DESCRIPTION	SYMBOL	LEGEND	BAY NO./ LOCATION	UNIT	QTY. (NO.)
1	33/0.433kV, 1000kVA, 3-PH OIL FILLED STATION TRANSFORMER		ST	33A, 33B	SET	02
2	36kV, 1250A, 31.5kA FOR 3 SEC., 3-PH VACUUM CIRCUIT BREAKER		52	33A, 33B	SET	02
3	36kV, 1250A, 31.5kA FOR 1 SEC., 3-PH ISOLATOR WITH ONE EARTH SWITCH		89	33A, 33B	SET	02
4	36kV, 50A, 31.5kA FOR 1 SEC., 1-PH, CURRENT TRANSFORMER		CTA	33A, 33B	NOS.	06
5	36kV, 1200A, 31.5kA FOR 1 SEC., 1-PH, CURRENT TRANSFORMER		CTB	33A, 33B	NOS.	06
6	30kV, 10kA, CLASS-III, 1-PH, LIGHTNING ARRESTER		LA1/LA2	33A, 33B	NOS.	12

Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar
15/03/2023

COUNTERSIGNED

Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar
15/3/23

Manager(Elect.)
EHT (Con-) Circle,
OPTCL, Bhubaneswar

13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

NOTES :

1. LT SUPLLY SOURCE –1 & 2: 33kV SIDE OF STATION TRANSFORMERS–1 & 2 ARE TO BE FED THROUGH TERTIARY LOADING OF ICT#1 & ICT#2. FURTHER, AS PER THE REPLY TO PRE–BID QUERY OF PKG–36(I)/2020–21, PROVIDED BY OPTCL IN ADDENDUM–2, EQUIPMENT WITH HIGHEST SYSTEM VOLTAGE OF 36kV ARE BEING PROVIDED IN THIS CIRCUIT.

2. As per tender condition complete design & engineering is on the scope of M/s BHEL, Hence 36kV equipment is to be supplied as per the BHEL of ICT tertiary Bushing.

Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep
06/3/2023

REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD
ZONE			ZONE			ZONE			ZONE		

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA				
OWNER:	ODISHA POWER TRANSMISSION CORPORATION LIMITED				
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.
	DRN.	AK			
	CHD.	DKS			N.A.
	APPD.	VK			
DEPT. TBG CODE	UNTOL. DIMS. GR. G/M/F	SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA		CARD CODE NA	DRG.NO. TB-3-420-510-001		REV. 00
			SHT. No 04	NO. OF SHT. 05	

SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001

400kV GIS CT DETAILS (CTA & CTB)

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
1	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
2	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
3	3000-2000-1000/1A	20	-	-	-	0.2s, ISF≤5	Metering
4	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
5	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection

400kV GIS LINE CT DETAILS (CTL)

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
1	3000-2000-1000/1A	10	-	-	-	0.2s, ISF≤5	Metering
2	3000-2000-1000/1A	10	-	-	-	0.2s, ISF≤5	Metering

220kV GIS CT DETAILS

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
CTA							
1	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
2	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
CTB					-		
1	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
2	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
3	1600-800/1 A	20	-	-	8-4	0.2s, ISF≤5	Metering

33kV OUTDOOR CT DETAILS

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
CTA							
1	50-25/1 A	15	-	-	-	PS	Protection
2	50-25/1 A	15	-	-	-	0.2s, ISF≤5	Metering
CTB							
1	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection
2	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection
3	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection

400kV GIS VT DETAILS (VT)

Winding No.	Ratio	Accuracy Class	Rated Burden (VA)	Purpose
1	(400kV/√3) / 110V/√3)	0.2	50	Metering
2	(400kV/√3) / 110V/√3)	3P	50	Protection
3	(400kV/√3) / 110V/√3)	3P	50	Protection

220kV GIS VT DETAILS (VT)

Winding No.	Ratio	Accuracy Class	Rated Burden (VA)	Purpose
1	(220kV/√3) / 110V/√3)	0.2	50	Metering
2	(220kV/√3) / 110V/√3)	3P	50	Protection
3	(220kV/√3) / 110V/√3)	3P	50	Protection

NOTES :

1. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.

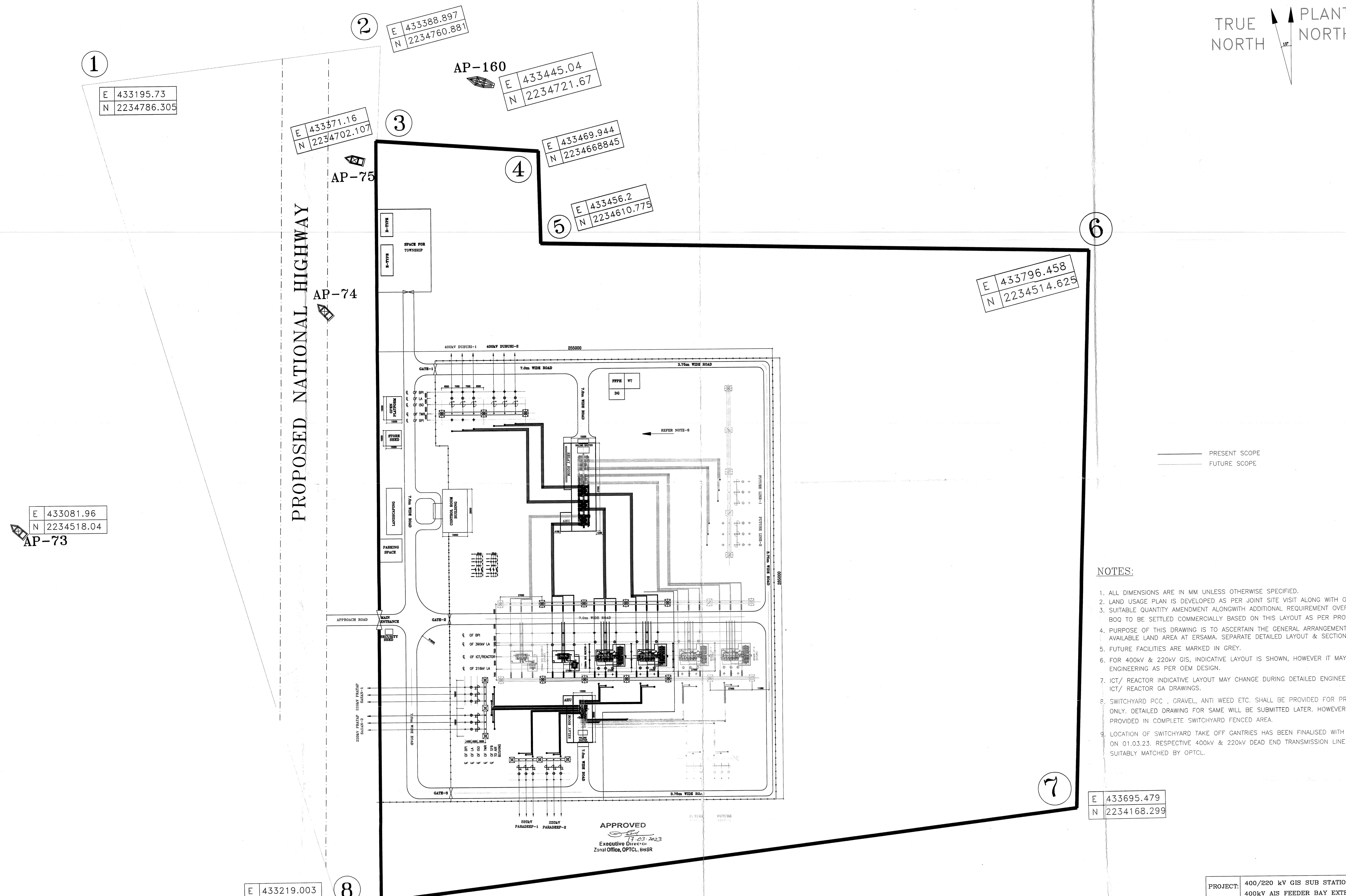
REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD
ZONE			ZONE			ZONE			ZONE		

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA				
OWNER:	ODISHA POWER TRANSMIISSIION CORPORATION LIMITED				
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.
	DRN.	AK			N.A.
	CHD.	DKS			
	APPD.	VK			
DEPT. TBG / CODE	UNTOL. DIMS. GR. 9/11/F	SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA	CARD CODE NA	DRG.NO. TB-3-420-510-001			REV. 00
		SHT. No 05	NO. OF SHT. 05		

SIZE-A3

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-420-316-000



Manager(Elect.) EHT (Const.) Circle, OPTCL, Bhubaneswar

Deputy General Manager (Elect.) E.H.T. Construction Division, OPTCL, Paradeep

COUNTERSIGNED

General Manager (Elect.) EHT, Construction Circle OPTCL, Bhubaneswar

Deputy Manager (EL.) Zonal Office, OPTCL Bhubaneswar

Deputy General Manager (EL.) Zonal Office, OPTCL Bhubaneswar

NOTES:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. LAND USAGE PLAN IS DEVELOPED AS PER JOINT SITE VISIT ALONG WITH OPTCL ON 01.03.2023.
3. SUITABLE QUANTITY AMENDMENT ALONGWITH ADDITIONAL REQUIREMENT OVER & ABOVE EXISTING CONTRACT BOQ TO BE SETTLED COMMERCIALLY BASED ON THIS LAYOUT AS PER PROVISIONS IN CONTRACT.
4. PURPOSE OF THIS DRAWING IS TO ASCERTAIN THE GENERAL ARRANGEMENT OF FACILITIES & EQUIMPENT ON AVAILABLE LAND AREA AT ERSAMA. SEPARATE DETAILED LAYOUT & SECTION DRAWING WILL BE SUBMITTED.
5. FUTURE FACILITIES ARE MARKED IN GREY.
6. FOR 400kV & 220kV GIS, INDICATIVE LAYOUT IS SHOWN, HOWEVER IT MAY CHANGE DURING DETAILED ENGINEERING AS PER OEM DESIGN.
7. ICT/ REACTOR INDICATIVE LAYOUT MAY CHANGE DURING DETAILED ENGINEERING STAGE AS PER ACTUAL ICT/ REACTOR GA DRAWINGS.
8. SWITCHYARD PCC , GRAVEL, ANTI WEED ETC. SHALL BE PROVIDED FOR PRESENT SCOPE EQUIPPED AREA ONLY. DETAILED DRAWING FOR SAME WILL BE SUBMITTED LATER. HOWEVER EARTHMAT LAYING SHALL BE PROVIDED IN COMPLETE SWITCHYARD FENCED AREA.
9. LOCATION OF SWITCHYARD TAKE OFF GANTRIES HAS BEEN FINALISED WITH OPTCL AS PER THE SITE VISIT ON 01.03.23. RESPECTIVE 400kV & 220kV DEAD END TRANSMISSION LINE TOWER LOCATIONS TO BE SUITABLY MATCHED BY OPTCL.

PROJECT:	400/220 kV GIS SUB STATION AT ERSAMA ODISHA & 400kV AIS FEEDER BAY EXTENTION DUBURI ODISHA
OWNER:	ODISHA POWER TRANSMISSION CORPORATION LIMITED

BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP NOIDA

	NAME	SIGN.	DATE
DRAWN	AK	-SIGNED-	04.02.23
CHECKED	DKS	-SIGNED-	04.02.23
APPROVED	VK	-SIGNED-	04.02.23

DEPT.	TBEM
CODE	422
SCALE	
CARD CODE	
DRG TITLE	LAND USAGE PLAN LAYOUT OF 400/220KV GIS SUB STATION AT ERSAMA
DRAWING NO.	TB-420-316-000
REV.	00
SHEET No.	01
NEXT SHEET	01

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

Project **OPTCL Ersama, Paradeep**
Item **400kV GIS**

Reply for pre-bid queries raised by bidders during pre-bid meeting on NIT's Terms and Conditions **Date: 02-05-23**

Sl.No.	Clause No.	Description as per NIT	Bidder's query/request during pre-bid discussion	BHEL Reply
1	5 of STC	PROPOSED DELIVERY PLAN: Supply of GIS by Mar'2024 and Commissioning of GIS by Dec'2024. Vendor to examine their best possible delivery plan & mention in ACTIVITY SCHEDULE. The same shall be submitted along with commercial offer duly signed and stamped by authorized person. In case, BHEL's delivery requirement is not met by vendor(s), then a chance may be given to all such vendors to review their quoted delivery schedule in line with BHEL's delivery requirement. Note- Time for Type tests (if required to be conducted) shall be mentioned separately in Activity Schedule. In case of conduction of Type tests, time mentioned for the same shall be added in PO delivery date.	Supply should be linked with award of contract and drawing approvals / manufacturing clearnace.	We have given activity schedule wherein time for each and individual activity should be mentioned and total time shall be calculated after addition of all individual activitie's time. And hence, total completion time would be from the date of PO.
2	11 of STC	Quantity Variation: BHEL shall have the right for variation in quantities of items within ± 20% of the total Purchase Order / Contract value at the time of placement of PO or award of Contract on overall basis or during Contract execution stage for all amendments together within **FOUR years** from the date of original Purchase Order. The quantities of individual items may vary up to any extent or may get deleted unless otherwise specified in the technical specifications. No compensation is payable due to variation in the quantities and the Supplier / Contractor shall be bound to accept the same at the contracted prices / rates.	We request you to confirm Quantity variations (if any) along with drawing approval or manufacturing clearance, whichever is earlier.	Quantity Variation: BHEL shall have the right for variation in quantities of items within ± 20% of the total Purchase Order / Contract value at the time of placement of PO or award of Contract on overall basis or during Contract execution stage for all amendments together within **TWO years** from the date of original Purchase Order. The quantities of individual items may vary up to any extent or may get deleted unless otherwise specified in the technical specifications. No compensation is payable due to variation in the quantities and the Supplier / Contractor shall be bound to accept the same at the contracted prices / rates.
3	17 of STC	Liquidated Damages: a) In case of delay in supply of material beyond the contractual delivery time allotted for supply, an amount of 0.5% of the total Purchase Order value* per week of delay or part thereof subject to a maximum of 5% of the total Purchase Order value* shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. b) In case of delay in providing the services beyond the contractual completion time allotted for services, an amount of 0.5% of the total Purchase Order value* per week of delay or part thereof subject to a maximum of 5% of the total Purchase Order value* shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD.	The delay in supply and / or Services shall be applicable for respective Supply and / or services PO value.	Liquidated Damages clause shall remain same as per NIT.
4	19 of STC	Performance BG- 19 A) 3% of the BHEL's PO Ex-works value 19 B) 3% of Total cost of Supply of GIS Equipment including Taxes (of end Customer's Contract) shall be submitted by OEM of GIS to the Owner (OPTCL)	As Seller is required to submit Additional Performance BG of 3% of Total Cost of Supply of GIS Equipment including Taxes (of end Customer's Contract) to OPTCL, this Performance BG submission to Buyer should be waived off.	Performance BG clause shall remain same as per NIT.

5	21 of STC	Terms of Payment- Supply Portion: A) 80% against receipt B)10% against completion of Supervision of ETC incl HV Testing Note: In case of Supervision of Erection, Testing including HV Testing & Commissioning gets delayed beyond 06 months from the date of last supply for the reasons not attributable to supplier, supplier may claim this 10% payment of supply portion by furnishing documents as per NIT. C) Last/Final 10% against completion of final engineering documentation as per technical specification and completion of supervision activity.	For the final 10% payment of Supply : 10% payment of total Invoice value against completion of final engineering documentation and completion of supervision activity within 60 days from the date of receipt of invoice. In case erection, testing & commissioning gets delayed **beyond six months** from the last date of supply for reasons not attributable to the supplier, supplier can claim this final 10% payment of supply portion by submitting Bank Guarantee of equivalent amount valid for 6 months with claim period of additional three months, BG to be extended till completion of Erection, Testing & Commissioning of GIS.	Terms of Payment- Supply Portion: A) 80% against receipt of materials as per NIT B)10% against completion of Supervision of ETC incl HV Testing as per NIT. Note: In case of Supervision of Erection, Testing including HV Testing & Commissioning gets delayed beyond 06 months from the date of last supply for the reasons not attributable to supplier, supplier may claim this 10% payment of supply portion by furnishing documents as per NIT. C) Last/Final 10% payment of Supply portion (as per NIT): Against completion of final engineering documentation as per technical specification and completion of supervision activity. Note: In case of Supervision of Erection, Testing including HV Testing & Commissioning gets delayed **beyond 12 months** from the date of last supply for the reasons not attributable to supplier, supplier may claim 5% (out of 10%) of payment of supply portion by furnishing following documents and balance 5% shall be paid as per NIT terms: a) Invoice b) Copy of certificate issued by BHEL site in charge, confirming that delay in Supervision of Erection, Testing including HV Testing & Commissioning is not attributable to supplier (to be arranged by BHEL TBG). c) Copy of Bank Guarantee of equivalent value initially valid for 6 months from the date of submission of invoice with additional claim period of three months. Incase Supervision of Erection, Testing including HV Testing & Commissioning is not successfully completed before expiry of Bank Guarantee, BG shall be kept suitably extended till successful completion of Supervision of Erection, Testing including HV Testing & Commissioning.
6	22 of STC	Mode of Payment: Payment shall be made directly to the supplier/vendor by BHEL through NEFT/RTGS	Through Letter of Credit	Mode of Payment shall remain same as per NIT.
7	37 of STC	Special Condition: Inspection cost for the inspectors is to be borne by vendor. Details are as per Annexure-F.	Arrangement of travel, boarding, lodging & other incidental expenses of inspection official(s) shall remain excluded from our scope of work.	Inspection cost for the inspectors is to be borne by vendor. Details are as per Annexure-F of NIT.
Note-	All other terms and conditions of NIT shall remain same.			

Ref. No. **Technical Corrigendum-00**

Date: **02.05.2023**

Project: **400/220 kV GIS S/s at Ersama (Paradeep), OPTCL**

Package: **Supply of 400kV GIS & its Accessories for 400/220 kV GIS S/s at Ersama (Paradeep) of OPTCL**

NIT No. 73065 & Enquiry No. 61G2300342 dated April 05, 2023

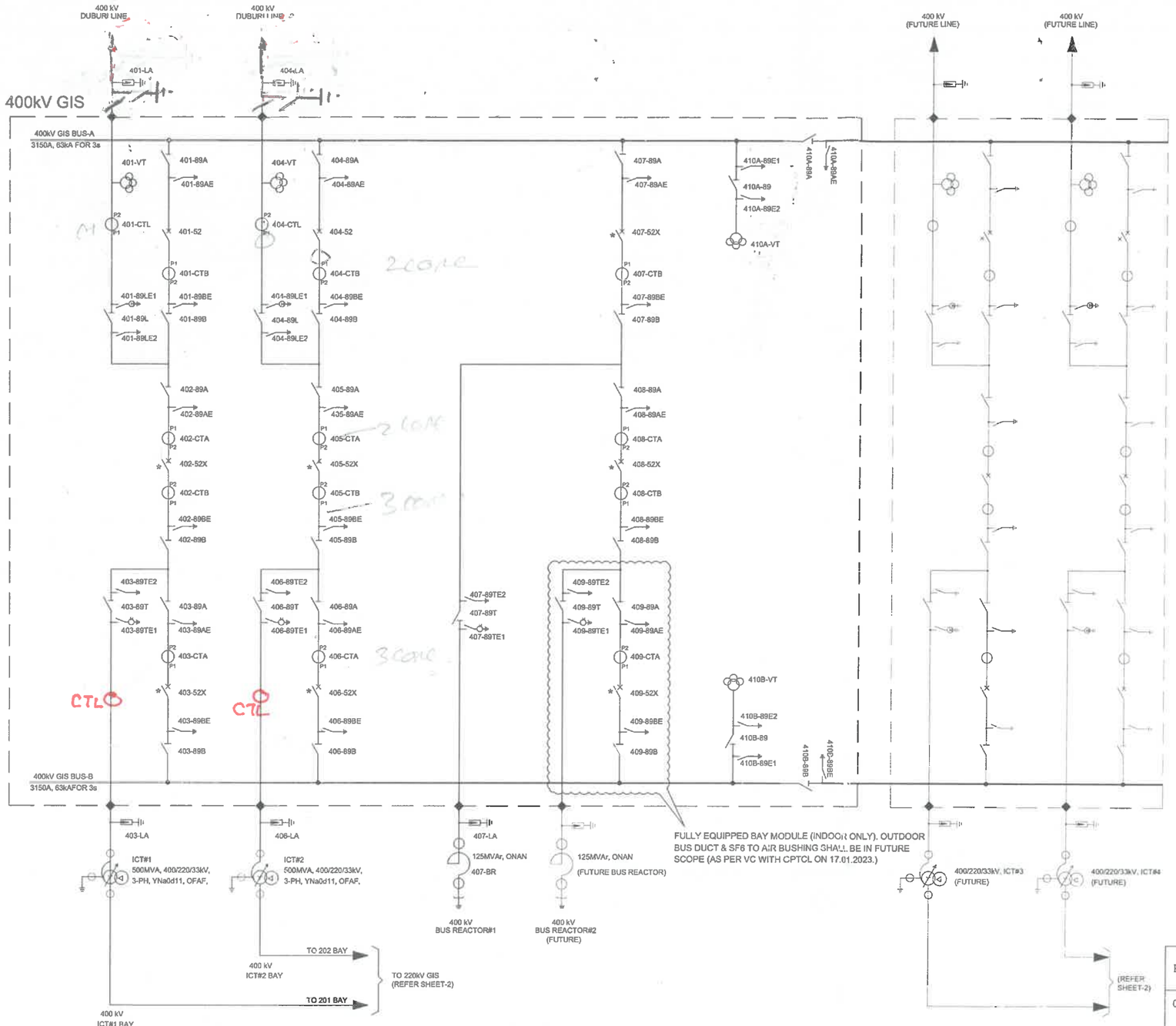
Sl. No.	Clause no./ Doc Reference	Document Description of Original Technical Specification	Technical Corrigendum-00
			Remarks, if any
1	**Annexure-BOQ: C.10**	SF6 to Air bushing as applicable for 400KV GIS	SF6 to Air bushing (single phase) as applicable for 400KV GIS
2	**Annexure-BOQ: G.2**	400kV, 3150A Disconnector (1 pole) without operating mechanism	400kV, 3150A Disconnector (3 pole) without operating mechanism
3	**Annexure-BOQ: G.5**	Surge Arrestor including Surge Counter	Surge Arrestor (single phase) including Surge Counter
4	**Section-1: Clause no. 14 TB-3-420-316-001:**	Single Line Diagram for 400/220kV GIS at Ersama	OPTCL approved Single Line Diagram for 400/220kV GIS at Ersama is enclosed.
5	**Section-1: Clause no. 14 TB-420-316-002:**	Layout Plan & Section Drawing for 400/220kV GIS at Ersama	OPTCL approved Layout/ Land Usage Plan Drawing for 400/220kV GIS at Ersama is enclosed (Drg. No. TB-420-316-000).
6	**Un-priced Bid format Item Sl. No. 1.04**	SUPPLY- GIS : 400KV, 3150A, ONE & HALF CIRCUIT BREAKER SCHEME - TIE GIS BAY - 2 Sets	Quantity of SUPPLY- GIS : 400KV, 3150A, ONE & HALF CIRCUIT BREAKER SCHEME - TIE GIS BAY - **3 Sets as mentioned in Annexure-BOQ.** **Evaluation of offers shall be done considering quantity of Tie Bays as 3 Sets.**

Note: Amendment/ addendum/ clarification/ corrigendum issued herein shall form part of Technical Specification. All bidders to please note that amendment/addendum/ clarification/ corrigendum issued will supersede the respective clause/ sub-clause of Technical Specification Document to the extent for the clause/ sub-clause or part thereof the amendment is issued.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

EQUIPMENT DESIGNATION FOR SLD

4	01	–	89	A/B/L/T	E

EARTH SWITCH
A–EQUIPMENT CONNECTED ON BUS–1 SIDE
B–EQUIPMENT CONNECTED ON BUS–2 SIDE
L–DEVICE CONNECTED TO LINE SIDE
T–EQUIPMENT CONNECTED TO TRANSFORMER/REACTOR
EQUIPMENT IDENTIFICATION (ISOLATOR)
BAY NO. : 01,02.....n
VOLTAGE LEVEL – 400kV

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

COUNTERSIGNED
13/3/23
Deputy General Manager (EL.)
EHT Construction Circle
OPTCL, Bhubaneswar

NOTES :

1. PRESENT _____
   FUTURE _____
2. * - CB WITH CONTROLLED SWITCHING DEVICE SHALL BE PROVIDED IN 400kV ICT#1, ICT#2 & BUS REACTOR BAYS ALONG WITH THEIR ASSOCIATED TIE BAYS.
3. BAY SEQUENCE FOR GIS IS TENTATIVE & MAY CHANGE IN LINE WITH THE REQUIREMENTS OF SERVICE CONTINUITY AND STANDARD DESIGN OF OEM.
4. LOCATION OF GIS CT IN BAY MAY CHANGE AS PER THE RECOMMENDATIONS OF OEM.
5. INDIVIDUAL EQUIPMENT OF GIS OR AIS WILL BE PROVIDED AS PER REQUIREMENTS OF TECHNICAL SPECIFICATION & DEVIATIONS (IF ANY) FROM TECHNICAL SPECIFICATION WILL BE TAKEN UP SEPARATELY.
6. CT/VT PARAMETERS OF 400kV GIS ARE DETAILED IN SEPARATE SHEET OF THIS DRAWING. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.
7. 420KV 3150A, 63K isolator with one E/S to be provided in each line feeder.
8. CSD to be provided on both the 400KV line Bay.

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

		NAME	SIGN.	DATE	NO.OF VAR.
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA	DRN.	AK			N.A.
	CHD.	DKS			
	APPD.	VK			

DEPT. / CODE	UNTOL. DIMS. CR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
TBG	g/M/f	N.T.S	N.A.	N.A.	N.A.	N.A.

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA
OWNER:	ODISHA POWER TRANSMIISSION CORPORATION LIMITED

TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA

CARD CODE: NA

DRG.NO. TB-3-420-510-001 REV. 00

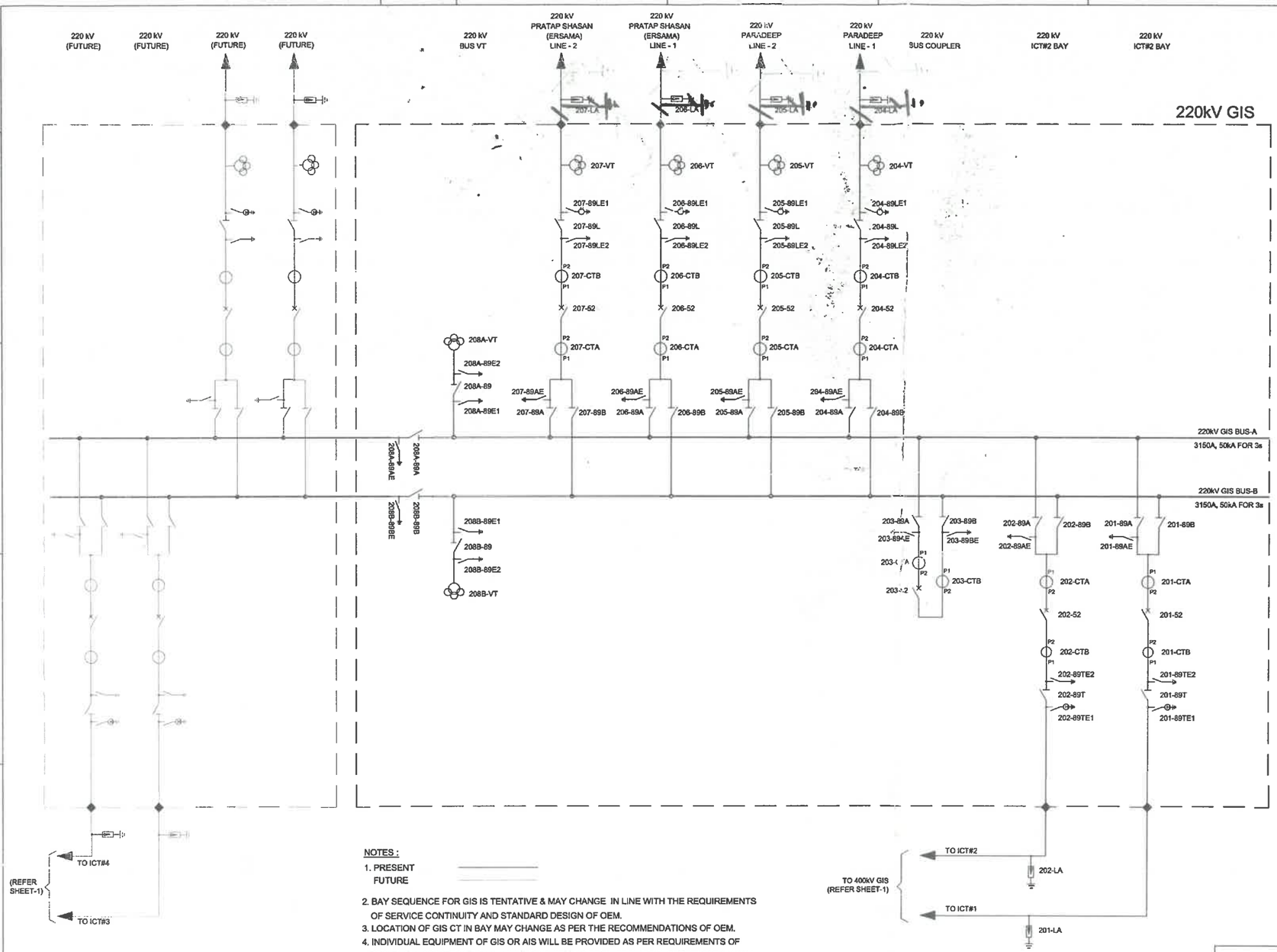
SHT. No 01 NO: OF SHT. 05

SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



NOTES :

1. PRESENT ——— FUTURE ———
2. BAY SEQUENCE FOR GIS IS TENTATIVE & MAY CHANGE IN LINE WITH THE REQUIREMENTS OF SERVICE CONTINUITY AND STANDARD DESIGN OF OEM.
3. LOCATION OF GIS CT IN BAY MAY CHANGE AS PER THE RECOMMENDATIONS OF OEM.
4. INDIVIDUAL EQUIPMENT OF GIS OR AIS WILL BE PROVIDED AS PER REQUIREMENTS OF TECHNICAL SPECIFICATION & DEVIATIONS (IF ANY) FROM TECHNICAL SPECIFICATION WILL BE TAKEN UP SEPARATELY.
5. CT/VT PARAMETERS OF 220kV GIS ARE DETAILED IN SEPARATE SHEET OF THIS DRAWING. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.
6. 245 KV 2000A 40 KA 5/1 with one E/S to be provided in each line feeder.

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

EQUIPMENT DESIGNATION FOR SLD

2	01	–	89	A/B/L/T	E

E – EARTH SWITCH
A – EQUIPMENT CONNECTED ON BUS–1 SIDE
B – EQUIPMENT CONNECTED ON BUS–2 SIDE
L – DEVICE CONNECTED TO LINE SIDE
T – EQUIPMENT CONNECTED TO TRANSFORMER/REACTOR
EQUIPMENT IDENTIFICATION (ISOLATOR)
BAY NO. : 01.02.....n
VOLTAGE LEVEL – 220kV

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

Manager(Elect.)
EHT (Const.) Circle,
QPTCL, Bhubaneswar

COUNTERSIGNED
13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA						
OWNER:	——— ODISHA POWER TRANSMIISSIION CORPORATION LIMITED						
BHEL	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.	
		DRN.	AK			N.A.	
		CHD.	DKS				
		APPD.	VK				
DEPT. TBG CODE	UNTOL. DIMS. GR. f/M/f		SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA		CARD CODE NA	DRG.NO. TB–3–420–510–001			REV. 00	
			SHT. No 02	NO. OF SHT. 05			

8 7 6 5 4 3 2 1 SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, BBSR

A. 400kV GIS EQUIPMENT: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	400kV, 3150A, 63kA FOR 3 SEC, 3-PH CIRCUIT BREAKER		52	401, 404	SETS	02
2.	400kV, 3150A, 63kA FOR 3 SEC, 3-PH CIRCUIT BREAKER WITH CSD		52X	402, 403, 405, 406, 407, 408, 409	SETS	07
3.	400kV, 3150A, 63kA FOR 1 SEC, 3-PH DISCONNECTOR		89A 89B 89L 89T 89	401, 402, 403, 404, 405, 406, 407, 408, 409, 410A 401, 402, 403, 404, 405, 406, 407, 408, 409, 410B 401, 404 403, 406, 407, 409 410A, 410B	SETS	28
4.	EARTH SWITCH , 3-PH , GROUP OPERATED		89AE 89BE 89LE2 89TE2 89E1 89E2	401, 402, 403, 404, 405, 406, 407, 408, 409, 410A 401, 402, 403, 404, 405, 406, 407, 408, 409, 410B 401, 404 403, 406, 407, 409 410A, 410B 410A, 410B	SETS	30
5.	HIGH SPEED EARTHING SWITCH , 3-PH, GROUP OPERATED		89LE1 89TE1	401, 404 403, 406, 407, 409	SETS	06
6.	400kV, 3000A, 63kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (5-CORE)		CTA CTB	402, 403, 405, 406, 408, 409 401, 402, 404, 405, 407, 408	SETS	36
7.	400kV, 3000A, 63kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (2-CORE)		CTL	401, 404	SETS	06
8.	400kV, 1-PH, 3 SECONDARY VOLTAGE TRANSFORMER		VT	401, 404, 410A, 410B	SETS	12

B. 220 kV INDOOR GIS: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	220kV,3150A, 50kA FOR 3 SEC, 3-PH CIRCUIT BREAKER		52	201, 202, 203, 204, 205, 206, 207	SETS	07
2.	220kV,3150A, 50kA FOR 1 SEC, 3-PH GROUP OPERATED DISCONNECTOR		89 89A 89B 89L 89T	208A, 208B 201, 202, 203, 204, 205, 206, 207, 208A 201, 202, 203, 204, 205, 206, 207, 208B 204, 205, 206, 207 201, 202	SETS	24
3.	EARTH SWITCH , 3-PH , GROUP OPERATED		89AE 89BE 89LE2 89TE2 89E1 89E2	201, 202, 203, 204, 205, 206, 207, 208A 203, 208B 204, 205, 206, 207 201, 202 208A, 208B 208A, 208B	SETS	20
4.	HIGH SPEED EARTHING SWITCH , 3-PH, GROUP OPERATED		89TE1 89LE1	201, 202 204, 205, 206, 207	SETS	06
5.	220kV, 3000A, 50kA FOR 1 SEC, 1-PH,CURRENT TRANSFORMER (2-CORE)		CTA	201, 202, 203, 204, 205, 206, 207	SETS	21
6.	220kV, 3000A, 50kA FOR 1 SEC, 1-PH, CURRENT TRANSFORMER (3-CORE)		CTB	201, 202, 203, 204, 205, 206, 207	SETS	21
7.	220kV, 1-PH, 3 SECONDARY VOLTAGE TRANSFORMER		VT	204, 205, 206, 207, 208A, 208B	SETS	18

C. OUTDOOR EQUIPMENT: –

S.N.	DESCRIPTION	SYMBOL	LEGEND	BAY NO/LOCATION	UNIT	QTY
1.	500MVA, 400/220/33KV, YNa0d11,OFAF, 3-PH ICT		ICT	ICT#1, ICT#2	NOS	02
2.	400kV, 125MVA, 3-PH BUS REACTOR		BR	409	NOS	01
3.	390kV, 20kA, CLASS-IV, 63kA, 1-PH, SURGE ARRESTER		LA	401, 403, 404, 406, 409	NOS	15
4.	216kV, 10kA, CLASS-III, 50kA, 1-PH, SURGE ARRESTER		LA	201, 202, 204, 205, 206, 207	NOS	18
5.	400kV, 3150A, 63kA FOR 1 SEC. SF6 TO AIR BUSHING			401, 403, 404, 406, 407, 409	NOS	15
6.	220kV, 3150A, 50kA FOR 1 SEC. SF6 TO AIR BUSHING			201, 202, 204, 205, 206, 207	NOS	18

15/03/2023
Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

SYSTEM PARAMETERS: –

S.N.	SYSTEM PARAMETERS	400kV	220kV
1.	NOMINAL VOLTAGE	400kV	220kV
2.	HIGHEST SYSTEM VOLTAGE	420kV	245kV
3.	RATED FREQUENCY	50Hz	50Hz
4.	RATED SHORT TIME CURRENT	63kA for 3s/1s (as applicable)	50kA for 3s/1s (as applicable)
5.	POWER FREQUENCY WITHSTAND VOLTAGE	630kV (rms)	460Kv (rms)
6.	LIGHTNING IMPULSE WITHSTAND VOLTAGE	±1425 kV peak	±1050 kV peak
7.	SWITCHING IMPULSE WITHSTAND VOLTAGE	±1050 kV peak	N.A
8.	CREEPAGE	31mm/kV (13020mm)	31mm/kV (7595mm)
9.	GROUNDING	Effectively earthed	Effectively earthed

COUNTERSIGNED
13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

Manager(Elect.)
EHT (Const.) Circle,
OPTCL, Bhubaneswar

15/3/23
Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar

06/03/2023
Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
ZONE			ZONE			ZONE			ZONE		

		NAME	SIGN.	DATE	NO.OF VAR.
BHEL	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA	DRN. AK			N.A.
		CHD. DKS			
		APPD. VK			

PROJECT: 400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA

OWNER: ODISHA POWER TRANSMIISSIION CORPORATION LIMITED

DEPT. TBG / CODE	UNTOL. DIMS. GR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
		N.T.S	N.A.	N.A.	N.A.	N.A.

TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA

CARD CODE: NA

DRG NO. TB-3-420-510-001 REV. 00

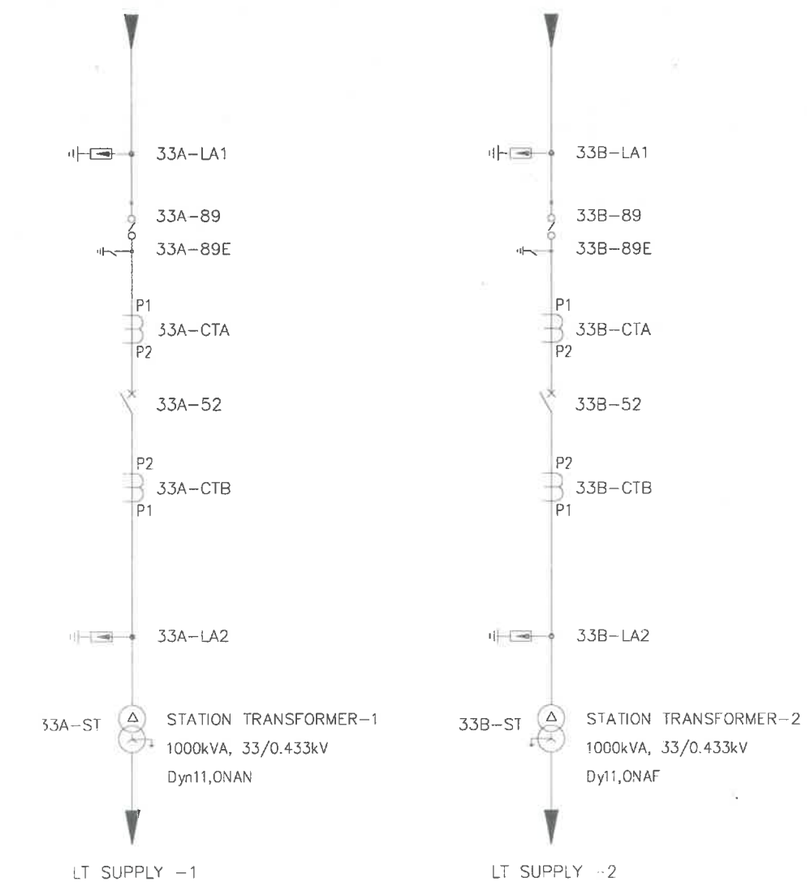
SHT. No 03 NO. OF SHT. 05

SIZE-A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001



33kV SYSTEM PARAMETERS: –

S.N.	SYSTEM PARAMETERS	33kV
1.	NOMINAL VOLTAGE	33kV ≫52KV
2.	HIGHEST SYSTEM VOLTAGE	36kV ≫52KV
3.	RATED FREQUENCY	50Hz
4.	RATED SHORT TIME CURRENT	31.5kA for 3s/1s (as applicable)
5.	POWER FREQUENCY WITHSTAND VOLTAGE	70kV (rms) 95KV(rms)
6.	LIGHTNING IMPULSE WITHSTAND VOLTAGE	±170 kV peak 250KVpeak
7.	CREEPAGE	31mm/kV (1116mm) 1612mm).
8.	GROUNDING	Effectively earthed

APPROVED
17.03.2023
Executive Director
Zonal Office, OPTCL, SSSR

BILL OF QTY. FOR 33kV OUTDOOR EQUIPMENT:

SL.NO.	DESCRIPTION	SYMBOL	LEGEND	BAY NO./ LOCATION	UNIT	QTY. (NO.)
1	33/0.433kV, 1000kVA, 3-PH OIL FILLED STATION TRANSFORMER		ST	33A, 33B	SET	02
2	36kV, 1250A, 31.5kA FOR 3 SEC., 3-PH VACUUM CIRCUIT BREAKER		52	33A, 33B	SET	02
3	36kV, 1250A, 31.5kA FOR 1 SEC., 3-PH ISOLATOR WITH ONE EARTH SWITCH		89	33A, 33B	SET	02
4	36kV, 50A, 31.5kA FOR 1 SEC., 1-PH, CURRENT TRANSFORMER		CTA	33A, 33B	NOS.	06
5	36kV, 1200A, 31.5kA FOR 1 SEC., 1-PH, CURRENT TRANSFORMER		CTB	33A, 33B	NOS.	06
6	30kV, 10kA, CLASS-III, 1-PH, LIGHTNING ARRESTER		LA1/LA2	33A, 33B	NOS.	12

Deputy General Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar
15/03/2023

COUNTERSIGNED

Deputy Manager (EL.)
Zonal Office, OPTCL
Bhubaneswar
15/3/23

Manager(Elect.)
EHT (Con-) Circle,
OPTCL, Bhubaneswar

13/3/23
General Manager (ELC.)
EHT, Construction Circle
OPTCL, Bhubaneswar

NOTES :

1. LT SUPLLY SOURCE –1 & 2: 33kV SIDE OF STATION TRANSFORMERS–1 & 2 ARE TO BE FED THROUGH TERTIARY LOADING OF ICT#1 & ICT#2. FURTHER, AS PER THE REPLY TO PRE–BID QUERY OF PKG–36(I)/2020–21, PROVIDED BY OPTCL IN ADDENDUM–2, EQUIPMENT WITH HIGHEST SYSTEM VOLTAGE OF 36kV ARE BEING PROVIDED IN THIS CIRCUIT.

2. As per tender condition complete design & engineering is on the scope of M/s BHEL, Hence 36kV equipment is to be supplied as per the BHEL of ICT tertiary Bushing.

Deputy General Manager (Elect.)
E.H.T. Construction Division,
OPTCL, Paradeep
06/3/2023

REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD	REV.	DATE	ALTERED CHD/APPD
ZONE			ZONE			ZONE			ZONE		

PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA				
OWNER:	ODISHA POWER TRANSMISSION CORPORATION LIMITED				
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.
	DRN.	AK			
	CHD.	DKS			N.A.
	APPD.	VK			
DEPT. TBG CODE	UNTOL. DIMS. GR. G/M/F	SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA		CARD CODE NA	DRG.NO. TB-3-420-510-001		REV. 00
			SHT. No 04	NO. OF SHT. 05	

SIZE–A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-420-510-001

400kV GIS CT DETAILS (CTA & CTB)

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
1	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
2	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
3	3000-2000-1000/1A	20	-	-	-	0.2s, ISF≤5	Metering
4	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection
5	3000-2000-1000/1A	-	3000-2000-1000	20-30-40	15-10-5	PS	Protection

400kV GIS LINE CT DETAILS (CTL)

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
1	3000-2000-1000/1A	10	-	-	-	0.2s, ISF≤5	Metering
2	3000-2000-1000/1A	10	-	-	-	0.2s, ISF≤5	Metering

220kV GIS CT DETAILS

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
CTA							
1	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
2	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
CTB					-		
1	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
2	1600-800/1 A	-	1600-800	20-40	8-4	PS	Protection
3	1600-800/1 A	20	-	-	8-4	0.2s, ISF≤5	Metering

33kV OUTDOOR CT DETAILS

Core No.	Current Ratio	Ooutput Burden at Lowest Tap (VA)	Minimum KPV (V)	Max. Ie(mA) at KPV	Maximum Rct (Ohms)	Accuracy Class	Purpose
CTA							
1	50-25/1 A	15	-	-	-	PS	Protection
2	50-25/1 A	15	-	-	-	0.2s, ISF≤5	Metering
CTB							
1	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection
2	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection
3	1200-600/1 A	-	1200-600	50-100	6-3	PS	Protection

400kV GIS VT DETAILS (VT)

Winding No.	Ratio	Accuracy Class	Rated Burden (VA)	Purpose
1	(400kV/√3) / 110V/√3)	0.2	50	Metering
2	(400kV/√3) / 110V/√3)	3P	50	Protection
3	(400kV/√3) / 110V/√3)	3P	50	Protection

220kV GIS VT DETAILS (VT)

Winding No.	Ratio	Accuracy Class	Rated Burden (VA)	Purpose
1	(220kV/√3) / 110V/√3)	0.2	50	Metering
2	(220kV/√3) / 110V/√3)	3P	50	Protection
3	(220kV/√3) / 110V/√3)	3P	50	Protection

NOTES :

1. PARAMETERS OF BUSHING CT OF TRANSFROMERS AND BUS REACTOR WILL BE PROVIDED LATER.

REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD	REV.	DATE	ALTERED / CHD/APPD
ZONE			ZONE			ZONE			ZONE		

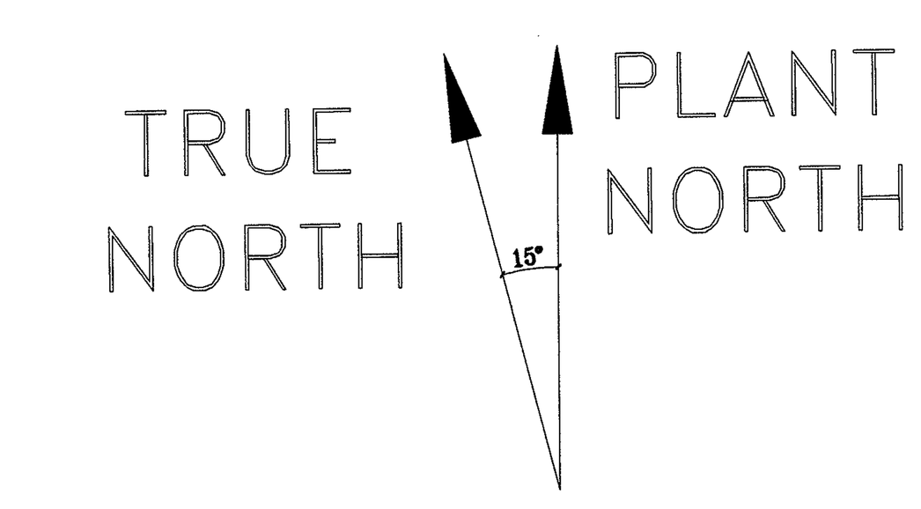
PROJECT:	400/220kVGIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA				
OWNER:	ODISHA POWER TRANSMIISSIION CORPORATION LIMITED				
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		NAME	SIGN.	DATE	NO.OF VAR.
	DRN.	AK			N.A.
	CHD.	DKS			
	APPD.	VK			
DEPT. TBG / CODE	UNTOL. DIMS. GR. 9/11/F	SCALE N.T.S	WEIGHT (KG) N.A.	REF. TO ASSY. DRG. N.A.	ITEM NO. N.A.	NO.OF ITEMS N.A.
TITLE: SINGLE LINE DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA	CARD CODE NA	DRG.NO. TB-3-420-510-001			REV. 00
		SHT. No 05	NO. OF SHT. 05		

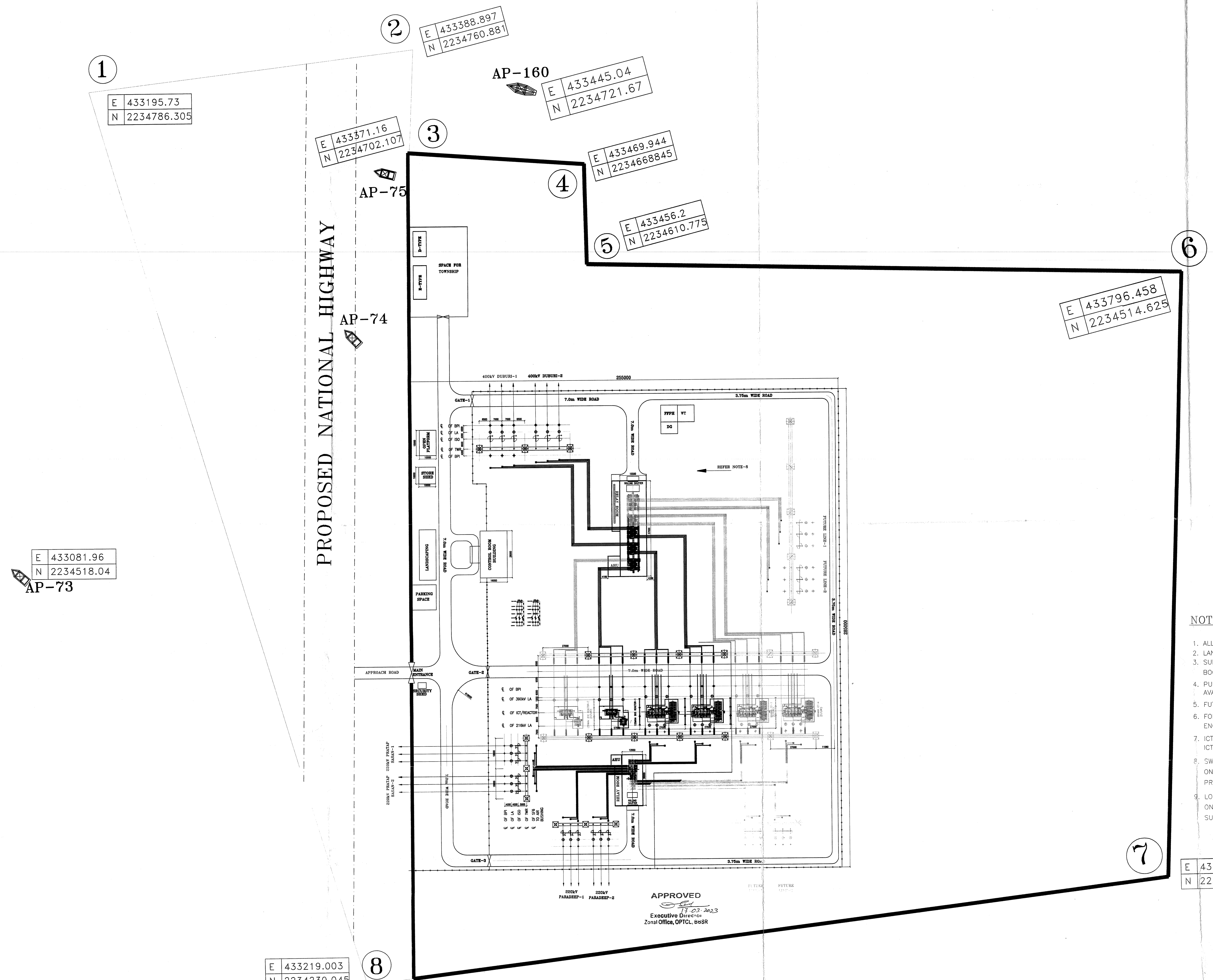
SIZE-A3

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-420-316-000

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY





PRESENT SCOPE
FUTURE SCOPE

APPROVED
Executive Director
Zonal Office, OPTCL, BBSR

NOTES:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. LAND USAGE PLAN IS DEVELOPED AS PER JOINT SITE VISIT ALONG WITH OPTCL ON 01.03.2023.
3. SUITABLE QUANTITY AMENDMENT ALONGWITH ADDITIONAL REQUIREMENT OVER & ABOVE EXISTING CONTRACT BOQ TO BE SETTLED COMMERCIALLY BASED ON THIS LAYOUT AS PER PROVISIONS IN CONTRACT.
4. PURPOSE OF THIS DRAWING IS TO ASCERTAIN THE GENERAL ARRANGEMENT OF FACILITIES & EQUIMPENT ON AVAILABLE LAND AREA AT ERSAMA. SEPARATE DETAILED LAYOUT & SECTION DRAWING WILL BE SUBMITTED.
5. FUTURE FACILITIES ARE MARKED IN GREY.
6. FOR 400kV & 220kV GIS, INDICATIVE LAYOUT IS SHOWN, HOWEVER IT MAY CHANGE DURING DETAILED ENGINEERING AS PER OEM DESIGN.
7. ICT/ REACTOR INDICATIVE LAYOUT MAY CHANGE DURING DETAILED ENGINEERING STAGE AS PER ACTUAL ICT/ REACTOR GA DRAWINGS.
8. SWITCHYARD PCC , GRAVEL, ANTI WEED ETC. SHALL BE PROVIDED FOR PRESENT SCOPE EQUIPPED AREA ONLY. DETAILED DRAWING FOR SAME WILL BE SUBMITTED LATER. HOWEVER EARTHMAT LAYING SHALL BE PROVIDED IN COMPLETE SWITCHYARD FENCED AREA.
9. LOCATION OF SWITCHYARD TAKE OFF GANTRIES HAS BEEN FINALISED WITH OPTCL AS PER THE SITE VISIT ON 01.03.23. RESPECTIVE 400kV & 220kV DEAD END TRANSMISSION LINE TOWER LOCATIONS TO BE SUITABLY MATCHED BY OPTCL.

Manager(Elect.) EHT (Const.) Circle, OPTCL, Bhubaneswar

Deputy General Manager (Elect.) E.H.T. Construction Division, OPTCL, Paradeep

COUNTERSIGNED
General Manager (Elect.) EHT, Construction Circle OPTCL, Bhubaneswar

Deputy Manager (EL.) Zonal Office, OPTCL Bhubaneswar

Deputy General Manager (EL.) Zonal Office, OPTCL Bhubaneswar

PROJECT:	400/220 kV GIS SUB STATION AT ERSAMA ODISHA & 400kV AIS FEEDER BAY EXTENTION DUBURI ODISHA
OWNER:	ODISHA POWER TRANSMISSION CORPORATION LIMITED

BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP NOIDA

	NAME	SIGN.	DATE
DRAWN	AK	-SIGNED-	04.02.23
CHECKED	DKS	-SIGNED-	04.02.23
APPROVED	VK	-SIGNED-	04.02.23

DEPT. TBEM	CODE 422	SCALE	CARD CODE
DRG TITLE: LAND USAGE PLAN LAYOUT OF 400/220KV GIS SUB STATION AT ERSAMA	DRAWING NO. TB-420-316-000	REV. 00	
	SHEET No. 01	NEXT SHEET 01	