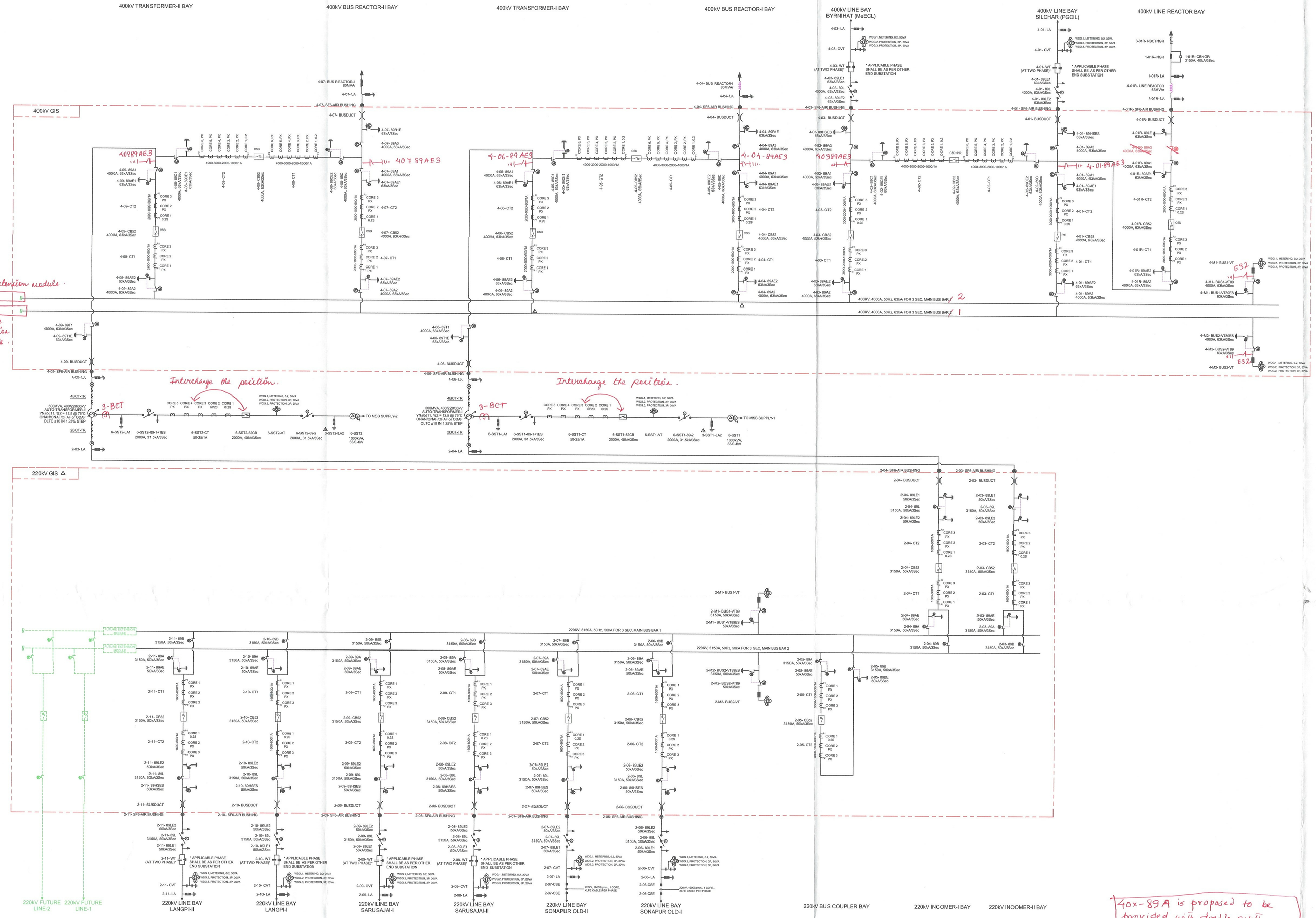

LEGEND	DESCRIPTION
	500MVA, 400/220/33kV, AUTO-TRANSFORMER WITH OLTC
	SF6 BUS DUCT
	SF6-TO-AIR BUSHING
	LIGHTNING ARRESTER (LA)
	TRANSFORMER BUSHING
PCT	BUSHING CURRENT TRANSFORMER
NECTNGR	NEUTRAL BUSHING CURRENT TRANSFORMER FOR NGR
	NEUTRAL GROUNDING REACTOR
	LINE / BUS REACTOR
	WAVE TRAP
	DOUBLE BREAK ISOLATOR
	DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH
	DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCH
	STATION SERVICE TRANSFORMER (SST)
	220kV CABLE SEALING END (CSE)
	CAPACITIVE VOLTAGE TRANSFORMER (CVT)
	CURRENT TRANSFORMER (CT)
	EARTH-DISCONNECTING SWITCH
	DISCONNECTING SWITCH
	HIGH SPEED EARTH-DISCONNECTING SWITCH
	VOLTAGE TRANSFORMER WITH ISOLATING LINK
	VOLTAGE TRANSFORMER
CBD	CIRCUIT BREAKER (WITH CONTROL SWITCHING DEVICE (CSD))
CBD PRR	CIRCUIT BREAKER (WITH PRE-INSERTION RESISTOR (PRR))
CBD PRR CSD	CIRCUIT BREAKER (WITH CSD AND PRR)
CBD	CIRCUIT BREAKER (WITHOUT CSD / PRR)
	THREE POSITION DISCONNECT SWITCH
	PRESENT SCOPE OF WORK
	FUTURE / EXISTING SCOPE

BILL OF QUANTITY : 72.5kV EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	1.03	72.5kV, 2000A, 31.5kA FOR 3SEC HORIZONTAL DOUBLE BREAK TYPE ISOLATOR WITHOUT EARTHSWITCH COMPLETE WITH MANUAL AND MOTOR DRIVEN OPERATING MECHANISM	2 Sets.	2 Sets.	
2.0	1.04	72.5kV, 2000A, 31.5kA FOR 3SEC HORIZONTAL DOUBLE BREAK TYPE ISOLATOR WITH EARTHSWITCH COMPLETE WITH MANUAL AND MOTOR DRIVEN OPERATING MECHANISM	2 Sets.	2 Sets.	
3.0	3.01	1000 KVA, 33/0.4kV STATION TRANSFORMER	2 Nos.	2 Nos.	
4.0	4.04	60kV, 10kA, LA (POLYMERIC TYPE) WITH SURGE COUNTER	12 Nos.	12 Nos.	VOLTAGE CLASS OF LA SHOULD BE 54kV
5.0	6.02	72.5kV, 3150A, 40kA FOR 3sec, OUTDOOR AIS CIRCUIT BREAKER	2 Sets.	2 Sets.	
6.0	8.01	72.5kV, 50/25/1-1-1-1-1-1 (0.2S-5P2-5P-5P-5P-5P) CORE CURRENT TRANSFORMER FOR TRANSFORMER TERMINAL	6 Nos.	6 Nos.	
7.0	8.02	72.5kV, POTENTIAL TRANSFORMER (3 NOS. 0.2-3P-3P)	6 Nos.	6 Nos.	

BILL OF QUANTITY : 132kV EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	4.03	120kV, 10kA, LA (POLYMERIC TYPE) COMPLETE WITH SURGE COUNTER	1 No.	1 No.	
2.0	6.01	145kV, 3150A, 40kA for 3sec, Outdoor AIS Single Pole Circuit Breaker	1 No.	1 No.	

BILL OF QUANTITY : 220kV EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	1.02	245kV, 3150A, 50kA FOR 3 Sec, HORIZONTAL DOUBLE BREAK TYPE ISOLATOR WITH DOUBLE EARTH SWITCH COMPLETE WITH MANUAL AND MOTOR DRIVER OPERATING MECHANISMS	6 Sets.	6 Sets.	
2.0	4.02	216kV, 10kA, LA (POLYMERIC TYPE) COMPLETE WITH SURGE COUNTER	24 Nos.	24 Nos.	
3.0	5.02	220kV, 4400pF, 3 Wdg CAPACITIVE VOLTAGE TRANSFORMER (CVT)	18 Nos.	18 Nos.	
4.0	5.04	220kV, 125DA PEDESTAL MOUNTED WAVE TRAP	8 Nos.	8 Nos.	
5.0	21.06	220kV CABLE TERMINATION KIT (SUITABLE FOR 1600sqmm.)	16 Nos.	16 Nos.	4 (3+1SPARE) Nos PER CIRCUIT FOR BOTH END

BILL OF QUANTITY : 220kV GIS EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	12.01	3-Ø 220kV, 3150A, 50kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- LINE BAY MODULE AS PER TECHNICAL SPECIFICATION	6 Sets.	6 Sets.	
2.0	12.02	3-Ø 220kV, 3150A, 50kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- 500MVA ICT/TRANSFORMER BAY MODULE AS PER TECHNICAL SPECIFICATION	2 Sets.	2 Sets.	
3.0	12.03	3-Ø 220kV, 3150A, 50kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- BUS REACTOR BAY MODULE AS PER TECHNICAL SPECIFICATION	1 Set.	1 Set.	
4.0	12.04	3-Ø 220kV, 3150A, 50kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- BUSBAR MODULE EACH ENCLOSED IN BUSBAR ENCLOSURES RUNNING ALONG THE LENGTH OF THE SWITCHGEAR TO INTERCONNECT EACH OF THE SWITCHGEAR BAYS FOR FORMING DOUBLE BUS BAR CONFIGURATION AS PER TECHNICAL SPECIFICATION ALONG WITH EXTENSION MODULE WITH ALL NECESSARY ARRANGEMENTS FOR FUTURE EXTENSION OF THE GIS IN DOUBLE MAIN CONFIGURATION	2 Sets.	2 Sets.	
5.0	12.05	245kV, 50kA for 3sec, SF6 TO AIR BUSHING	24 Nos.	24 Nos.	

NOTES :

1. THE DIAMETER, BAY AND EQUIPMENT NUMBERING WILL BE FINALISED BASED ON APPROVED ELECTRICAL LAYOUT.
2. EQUIPMENT CONNECTING ALUMINUM TUBE, CONDUCTOR SIZE AND TYPE SHALL BE INDICATED IN THE ELECTRICAL LAYOUT - PLAN AND ~~SECTION~~ DRAWING.
3. THE RATING INDICATED IN THE BOQ ~~SUBJECT~~ TO APPROVAL OF INDIVIDUAL EQUIPMENT DRAWINGS/DTP.
4. TRANSFORMER PERCENTAGE IMPEDENCE TOLERANCE WILL BE APPLICABLE AS PER THE RELEVANT IEC STANDARD.
5. THIS DRAWING IS APPLICABLE FOR PRESENT SCOPE OF WORK ONLY.

REFERENCE DOCUMENT :

1. TENDER DRAWING : SINGLE LINE DIAGRAM, DWG. NO. NAC/AEGCL/RANGIA/ELD-003.

NOMENCLATURE

4 - 01 - LA
- LA — EQUIPMENT NAME
- 01 — BAY NUMBER
- 4 — SYSTEM VOLTAGE LEVEL (4 FOR 400kV, 2 FOR 220kV, 1 FOR 145kV, 6 FOR 72.5kV, 3 FOR 36kV)

BILL OF QUANTITY : 400kV GIS EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	11.01	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- LINE BAY MODULE WITH PIR AS PER TECHNICAL SPECIFICATION	1 Set.	1 Set.	
2.0	11.02	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- LINE BAY MODULE WITHOUT CBD/PIR AS PER TECHNICAL SPECIFICATION	1 Set.	1 Set.	
3.0	11.03	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- SWITCHABLE LINE REACTOR BAY MODULE WITH CBD AS PER TECHNICAL SPECIFICATION	1 Set.	1 Set.	
4.0	11.04	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- TRANSFORMER BAY MODULE WITH CBD AS PER TECHNICAL SPECIFICATION	2 Sets.	2 Sets.	
5.0	11.05	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR - TIE BAY MODULE WITH CBD AND PIR AS PER TECHNICAL SPECIFICATION	2 Sets.	2 Sets.	
6.0	11.06	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR - TIE BAY MODULE WITHOUT PIR + CBD AS PER TECHNICAL SPECIFICATION	1 Set.	1 Set.	
7.0	11.07	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- BUS REACTOR BAY MODULE WITH CBD AS PER TECHNICAL SPECIFICATION	2 Sets.	2 Sets.	
8.0	11.08	3-Ø 400kV, 4000A, 63kA 3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR- BUSBAR MODULE EACH ENCLOSED IN BUSBAR ENCLOSURES RUNNING ALONG THE LENGTH OF THE SWITCHGEAR TO INTERCONNECT EACH OF THE SWITCHGEAR BAYS FOR FORMING ONE AND HALF BREAKER CONFIGURATION AS PER TECHNICAL SPECIFICATION ALONG WITH EXTENSION MODULE WITH ALL NECESSARY ARRANGEMENTS FOR FUTURE EXTENSION OF THE GIS IN ONE & HALF BREAKER ARRANGEMENT	2 Sets.	2 Sets.	
9.0	11.09	400kV,63kA for 3sec, SF6 TO AIR BUSHING	21 Nos.	21 Nos.	

BILL OF QUANTITY : 400kV EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	1.01	420kV, 4000A, 63kA FOR 3 Sec, HORIZONTAL DOUBLE BREAK TYPE ISOLATOR WITH DOUBLE EARTH SWITCH COMPLETE WITH MANUAL AND MOTOR DRIVEN OPERATING MECHANISM	2 Sets.	2 Sets.	
2.0	4.01	396kV, 20kA, LA (POLYMERIC TYPE) COMPLETE WITH SURGE COUNTER	21 Nos.	21 Nos.	
3.0	5.01	400kV, 8800pF, 3 Wdg CAPACITIVE VOLTAGE TRANSFORMER (CVT)	6 Nos.	6 Nos.	
4.0	5.03	400kV, 315kA PEDESTAL MOUNTED WAVE TRAP	4 Nos.	4 Nos.	
5.0	14.01	500 MVA, 400/220/33 kV, THREE PHASE AUTO-TRANSFORMER WITH OLTC +10% TO -10% IN 1.25% STEPS, YNa0o11, ONAN/ONAF/ONAF or ODAF, IMPEDANCE AT 75°C : 12.5% @ PRINCIPLE TAP	2 Nos.	2 Nos.	WITH BUSHING CT
6.0	15.01	80MVAR, 420kV, 3 PHASE, STAR WITH NEUTRAL BROUGHTOUT, ONAN CORELESS BUS REACTOR	2 Nos.	2 Nos.	
7.0	16.01	63MVAR, 420kV, 3 PHASE, STAR WITH NEUTRAL BROUGHTOUT, ONAN CORELESS LINE REACTOR	1 No.	1 No.	
7.1		145kV NEUTRAL GROUNDING REACTOR (NGR) FOR LINE REACTOR, CONTINUOUS CURRENT RATING 10A, SHORT TIME CURRENT RATING 80A FOR 10 SEC.	1 No.	1 No.	

40x-89A is proposed to be provided with double earth switch in the gas SLD: The earth sw is to be provided with mechanical & Electrical interlock in LCC scheme. PMC.

* The GIS arrangement shall be as per approved final SLD. (including EOM)

REV	DESCRIPTION	PREP.	CHKD.	APPD.	DATE
2	THIRD SUBMISSION (REVISED AS PER COMMENTS RECEIVED FROM AEGCL)	S.S	A.B	S.D	03.03.2025
1	SECOND SUBMISSION (REVISED AS PER COMMENTS RECEIVED FROM AEGCL DATED. 23.12.24)	S.D.B	S.D.B	B.R	01.01.2025
0	FIRST SUBMISSION	S.D.B	S.D.B	B.R	13.11.2024

SIGN.

Team Leader
Pt. Feedback Infra
Indonesia

OWNER	ASSAM ELECTRICITY GRID CORPORATION LIMITED
EPC	TECHNO ELECTRIC & ENGINEERING COMPANY LIMITED (THIS DRAWING IS THE PROPERTY OF ASSAM ELECTRICITY GRID CORPORATION LTD. AND MUST NOT BE COPIED OR USED WITHOUT THEIR PRIOR PERMISSION)
NOA :	AEGCL/MD/AIIB/400kv/Sonapur/Tender/PkgH/2023-24/Extn-2/71 Dtd: 13.09.2024
PROJECT :	CONSTRUCTION OF 400/220kV, GIS AT SONAPUR AND ASSOCIATED TRANSMISSION LINES AND BAY EXTENSION WORKS AT EXISTING 220kV SONAPUR GIS INCLUDING BAY AUGMENTATION AT SARUSAJAI GSS
SUBSTATION :	400/220kV GAS INSULATED SUBSTATION AT SONAPUR
DRG. TITLE	SONAPUR SS - SINGLE LINE DIAGRAM FOR NEW 400/220kV SUBSTATION AND 220kV GIS EXTENSION AT EXISTING SUBSTATION
DRG. NO. :	AEGCL-SONA-0816SN-ELE-SLD-001
SCALE : 1:1	JOB NO: 0816SN SHEET 1 OF 2

2	Checked By AAH (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)
1			Checked By CGM (P&D)
			Approved By GM (P&D)

11-70

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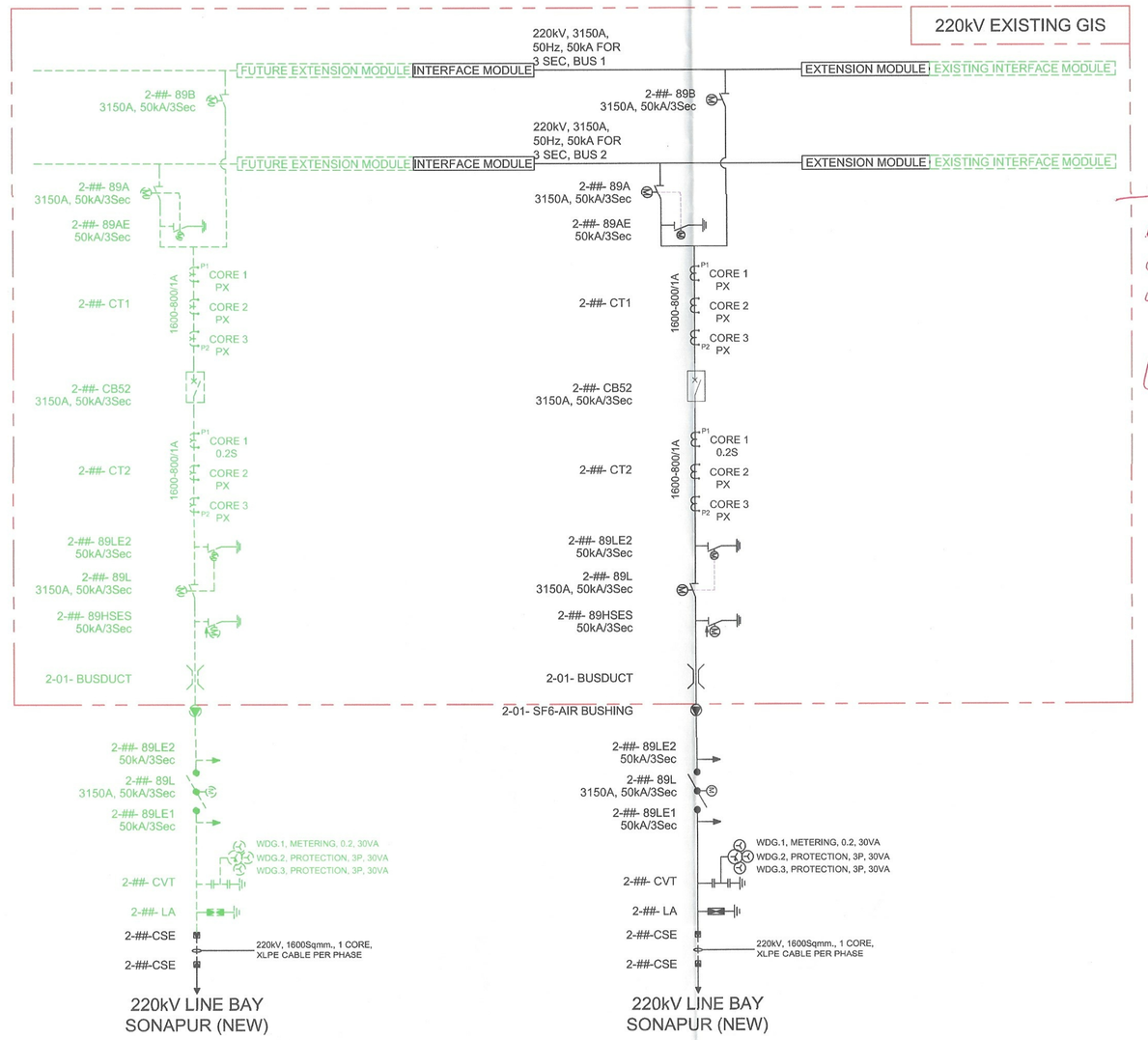

The extension / interface module detail shall be as per approved OEM design / layout. (To be updated later)

BAY NUMBERS WILL BE UPDATED AS PER LAYOUT OF EXISTING SONAPUR SUBSTATION

LEGEND	DESCRIPTION
	SF6 BUS DUCT
	SF6-TO-AIR BUSHING
	LIGHTNING ARRESTER (LA)
	DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCH
	220kV CABLE SEALING END (CSE)
	CAPACITIVE VOLTAGE TRANSFORMER (CVT)
	CURRENT TRANSFORMER (CT)
	EARTH-DISCONNECTING SWITCH
	DISCONNECTING SWITCH
	HIGH SPEED EARTH-DISCONNECTING SWITCH
VT	VOLTAGE TRANSFORMER WITH ISOLATING LINK
VT	VOLTAGE TRANSFORMER
CB52	CIRCUIT BREAKER (WITHOUT CSD / PIR)
	PRESENT SCOPE OF WORK
	FUTURE / EXISTING SCOPE

REACTOR AND NGR BCT DESCRIPTION

a. Ratio	REACTOR			NGR
	LINE SIDE	NEUTRAL SIDE	COMMON NEUTRAL SIDE	EARTH SIDE
CORE 1	200/1A	200/1A	200/1A	200/1A
CORE 2	200/1A	**	- -	- -
CORE 3	200/1A	3000-2000-500/1A	- -	- -
CORE 4	200/1A	3000-2000-500/1A	- -	- -
b. Minimum Knee Point Voltage or Burden and Accuracy Class				
CORE 1	200V, PX/PS	300V, PX/PS	200V, PX/PS	200V, PX/PS
CORE 2	200V, PX/PS	**	- -	- -
CORE 3	200V, PX/PS	3000-2000-500V PX/PS	- -	- -
CORE 4	10VA, Class 1.0	3000-2000-500V PX/PS	- -	- -
c. Minimum CT Secondary Resistance				
CORE 1	1 Ohm	1 Ohm	1 Ohm	1 Ohm
CORE 2	1 Ohm	**	- -	- -
CORE 3	1 Ohm	15-10-2.5 Ohm	- -	- -
CORE 4	- -	15-10-2.5 Ohm		- -
d. Exciting current (max.)				
CORE 1	250mA @ Vk/4	250mA @ Vk/4	- -	- -
CORE 2	250mA @ Vk/4	- -	- -	- -
CORE 3	250mA @ Vk/4	20mA@3000/1 30mA@2000/1 120mA@500/1	- -	- -
CORE 4	- -	20mA@3000/1 30mA@2000/1 120mA@500/1	- -	- -
e. Application				
CORE 1	REACTOR DIFFERENTIAL	REACTOR DIFFERENTIAL	RESTRICTED EARTH FAULT	RESTRICTED EARTH FAULT
CORE 2	RESTRICTED EARTH FAULT	TEMPERATURE INDICATOR (ON ONE PHASE ONLY)	- -	- -
CORE 3	REACTOR BACKUP	LINE PROTN. (MAIN-I) / T ZONE DIFF. PROT. / SPARE	- -	- -
CORE 4	METERING	LINE PROTN. (MAIN-II) / T ZONE DIFF. PROT. / SPARE	- -	- -

** RATING TO BE DECIDED AS PER REACTOR MANUFACTURER

* Reactor & NGR BCT details shall be as per approved design / drawing (To be updated later)

* The GIS CT/VT details shall be as per CT/VT sizing calculation. (To be updated later).

400kV GIS CT DESCRIPTION (LINE BAY)

SPECIFICATION	SECONDARY (CT-1)			SECONDARY (CT-2)		
	CORE-I	CORE-II	CORE-III	CORE-I	CORE-II	CORE-III
TURNS RATIO	3000 - 2000 - 1000 : 1 - 1 - 1			3000 - 2000 - 1000 : 1 - 1 - 1		
ACCURACY CLASS	PX	PX	PX	0.2s	PX	PX
OUTPUT BURDEN (VA)	- -	- -	- -	20 - 20 - 20	- -	- -
KNEE POINT VOLTAGE (Vk) (VOLT)	3000 - 2000 - 1000	3000 - 2000 - 1000	3000 - 2000 - 1000	- -	3000 - 2000 - 1000	3000 - 2000 - 1000
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	15 - 10 - 5	15 - 10 - 5	15 - 10 - 5	- -	15 - 10 - 5	15 - 10 - 5
MAX. EXCITATION CURRENT AT Vk (IN mA)	20 - 30 - 60	20 - 30 - 60	20 - 30 - 60	- -	20 - 30 - 60	20 - 30 - 60

400kV GIS CT DESCRIPTION (TRANSFORMER BAY/BUS REACTOR/LINE REACTOR)

SPECIFICATION	SECONDARY (CT-1)			SECONDARY (CT-2)		
	CORE-I	CORE-II	CORE-III	CORE-I	CORE-II	CORE-III
TURNS RATIO	2000 - 1000 - 500 : 1 - 1 - 1			2000 - 1000 - 500 : 1 - 1 - 1		
ACCURACY CLASS	PX	PX	PX	0.2s	PX	PX
OUTPUT BURDEN (VA)	- -	- -	- -	20 - 20 - 20	- -	- -
KNEE POINT VOLTAGE (Vk) (VOLT)	2000 - 1000 - 500	2000 - 1000 - 500	2000 - 1000 - 500	- -	2000 - 1000 - 500	2000 - 1000 - 500
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	10 - 5 - 2.5	10 - 5 - 2.5	10 - 5 - 2.5	- -	10 - 5 - 2.5	10 - 5 - 2.5
MAX. EXCITATION CURRENT AT Vk (IN mA)	30 - 60 - 120	30 - 60 - 120	30 - 60 - 120	- -	30 - 60 - 120	30 - 60 - 120

400kV GIS CT DESCRIPTION (TIE BAY)

SPECIFICATION	SECONDARY (CT-1 / CT-2)					
	CORE-I	CORE-II	CORE-III	CORE-IV	CORE-V	CORE-VI
TURNS RATIO	4000 - 3000 - 2000 - 1000 : 1 - 1 - 1					
ACCURACY CLASS	0.2s	PX	PX	PX	PX	PX
OUTPUT BURDEN (VA)	20 - 20 - 20	- -	- -	- -	- -	- -
KNEE POINT VOLTAGE (Vk) (VOLT)	- -	4000-3000-2000-1000	4000-3000-2000-1000	4000-3000-2000-1000	4000-3000-2000-1000	4000-3000-2000-1000
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	- -	20 - 15 - 10 - 5	20 - 15 - 10 - 5	20 - 15 - 10 - 5	20 - 15 - 10 - 5	20 - 15 - 10 - 5
MAX. EXCITATION CURRENT AT Vk (IN mA)	- -	15 - 20 - 30 - 60	15 - 20 - 30 - 60	15 - 20 - 30 - 60	15 - 20 - 30 - 60	15 - 20 - 30 - 60

220kV GIS CT DESCRIPTION (220kV SIDE OF 400/220kV TRANSFORMER BAY / 220kV LINE BAY)

SPECIFICATION	SECONDARY (CT-1)			SECONDARY (CT-2)		
	CORE-I	CORE-II	CORE-III	CORE-I	CORE-II	CORE-III
TURNS RATIO	1600 - 800 : 1 - 1			1600 - 800 : 1 - 1		
ACCURACY CLASS	PX	PX	PX	0.2s	PX	PX
OUTPUT BURDEN (VA)	- -	- -	- -	20 - 20 - 20	- -	- -
KNEE POINT VOLTAGE (Vk) (VOLT)	1600 - 800	1600 - 800	1600 - 800	- -	1600 - 800	1600 - 800
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	8 - 4	8 - 4	8 - 4	- -	8 - 4	8 - 4
MAX. EXCITATION CURRENT AT Vk (IN mA)	25 - 50	25 - 50	25 - 50	- -	25 - 50	25 - 50

220kV GIS CT DESCRIPTION (220kV BUS COUPLER BAY)

SPECIFICATION	SECONDARY (CT-1)			SECONDARY (CT-2)		
	CORE-I	CORE-II	CORE-III	CORE-I	CORE-II	CORE-III
TURNS RATIO	3000 - 1600 - 800 : 1 - 1			3000 - 1600 - 800 : 1 - 1		
ACCURACY CLASS	PX	PX	PX	0.2s	PX	PX
OUTPUT BURDEN (VA)	- -	- -	- -	20 - 20 - 20	- -	- -
KNEE POINT VOLTAGE (Vk) (VOLT)	3000 - 1600 - 800	3000 - 1600 - 800	3000 - 1600 - 800	- -	3000 - 1600 - 800	3000 - 1600 - 800
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	15 - 8 - 4	15 - 8 - 4	15 - 8 - 4	- -	15 - 8 - 4	15 - 8 - 4
MAX. EXCITATION CURRENT AT Vk (IN mA)	* - 25 - 50	* - 25 - 50	* - 25 - 50	- -	* - 25 - 50	* - 25 - 50

* RATING TO BE DECIDED AS PER GIS MANUFACTURER

TRANSFORMER BCT DESCRIPTION

SPECIFICATION	CORE-I			CORE-II			CORE-III		
	HV	IV	NEUTRAL	HV	IV	NEUTRAL	HV	IV	NEUTRAL
TURNS RATIO	1600:1	1600:1	1600:1	1000:1	1600:1	--	PARAMETERS OF WTI CT FOR EACH WINDING SHALL BE PROVIDED BY THE VENDOR		
CLASS	PX	PX	PX	0.2S	0.2S	--			
KNEE POINT VOLTAGE	1600	1600	1600	--	--	--			
MAX. CT SECONDARY RESISTANCE (Rct) (Ω)	4	4	4	--	--	--			
MAGNATIZING CURRENT(mA)	25	25	25	--	--	--			
OUTPUT BURDEN (VA)	--	--	--	20	20	--			
INSTRUMENT SECURITY FACTOR	--	--	--	≤5	≤5	--			
APPLICATION	RESTRICTED EARTH FAULT			METERING					

* Tertiary BCT shall be included.

* The BCT details of IV, HV & LV shall be as per approved drawing (To be updated later).

BILL OF QUANTITY : 220kV EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	2.02	245kV, 3150A, 50kA FOR 3 Sec, HORIZONTAL DOUBLE BREAK TYPE ISOLATOR WITH DOUBLE EARTH SWITCH COMPLETE WITH MANUAL AND MOTOR DRIVEN OPERATING MECHANISMS	1 Sets.	1 Sets.	
2.0	2.01	216kV, 10kA, LA (POLYMERIC TYPE) COMPLETE WITH SURGE COUNTER	3 Nos.	3 Nos.	
3.0	2.03	220kV, 4400pF, 3 Wdg CAPACITIVE VOLTAGE TRANSFORMER (CVT)	3 Nos.	3 Nos.	

BILL OF QUANTITY : 220kV GIS EQUIPMENT

SL. NO.	SL. NO. AS PER PRICE SCHEDULE	DESCRIPTION AS PER PRICE SCHEDULE	QUANTITY		REMARKS
			AS PER PRICE SCHEDULE	AS PER ENGINEERING	
1.0	3.01	3-Ø 220kV, 3150A, 50kA-3sec, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR - LINE BAY MODULE AS PER TECHNICAL SPECIFICATION	1 Nos.	1 Nos.	
2.0	3.02	3- Ø 220 kV, 3150 A, 50 kA-3 SEC, METAL ENCLOSED SF6 GAS INSULATED SWITCHGEAR - BUS BAR MODULE EACH ENCLOSED IN BUS BAR ENCLOSURES RUNNING ALONG THE LENGTH OF THE SWITCHGEAR TO INTERCONNECT EACH OF THE CIRCUIT BREAKER BAY MODULES IN DOUBLE BUS BAR CONFIGURATION AS PER TECHNICAL SPECIFICATION ALONG WITH BUS EXTENSION MODULE WITH ALL NECESSARY ARRANGEMENTS FOR INTERFACING WITH THE PRESENT GIS IN DOUBLE MAIN CONFIGURATION.	2 Sets.	2 Sets.	
3.0	12.05	245kV, 50kA for 3sec, SF6 TO AIR BUSHING	3 Nos.	3 Nos.	

SYSTEM PARAMETERS:

SL No	DESCRIPTION	400kV	220kV	132kV	66kV	33kV
1.0	SYSTEM OPERATING VOLTAGE (Ur)	400 kV	220 kV	132 kV	66 kV	33 kV
2.0	MAXIMUM OPERATING VOLTAGE OF THE SYSTEM (RMS) (Um)	420 kV	245 kV	145 kV	72.5 kV	36 kV
3.0	RATED FREQUENCY (fr)	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
4.0	RATED SHORT CIRCUIT CURRENT	63 kA / 3 Sec.	50 kA / 3 Sec.	40 kA / 3 Sec.	31.5 kA / 3 Sec.	31.5 kA / 3 Sec.
RATED INSULATION LEVELS AS PER CEA						
5.0	FULL-WAVE IMPULSE WITHSTAND VOLTAGE (1.2/50 MICRO SEC.)	1425 kVp	1050 kVp	650 kVp	325 kVp	170 kVp
6.0	SWITCHING IMPULSE WITHSTAND VOLTAGE (250/2500 MICRO SEC.) DRY AND WET	1050 kVp	--	--	--	--
7.0	ONE MINUTE POWER FREQUENCY DRY WITHSTAND VOLTAGE (RMS)	630 kV	--	--	--	--
8.0	ONE MINUTE POWER FREQUENCY DRY AND WET WITHSTAND VOLTAGE (RMS)	650 kVrms	460 kVrms	275 kVrms	140 kVrms	70 kVrms
9.0	CORONA EXTINCTION VOLTAGE	320 kVrms	156 kVrms	105 kVrms	--	--
10.0	MAX. RADIO INTERFERENCE VOLTAGE FOR FREQUENCY BETWEEN 0.5 MHZ AND 2 MHZ AT 266kV MAX. RADIO INTERFERENCE VRMS FOR 400kV SYSTEM AND 156kV RMS FOR 220kV SYSTEM	1000 microvolts	1000 microvolts	500 microvolts	--	--
11.0	MINIMUM CREEPAGE DISTANCE (31mm/kV)	13020 mm	7595 mm	4495 mm	2248 mm	1116 mm
MINIMUM CLEARANCES AS PER TECHNICAL SPECIFICATION ⚠						
12.0	PHASE TO PHASE	4000 mm	2100 mm	1300 mm	750 mm	320 mm
13.0	PHASE TO EARTH	3500 mm	2100 mm	1300 mm	630 mm	320 mm
14.0	SECTIONAL CLEARANCES	6500mm	5000mm	3800mm	3100mm	3000mm
15.0	SYSTEM EARTHING	EFFECTIVELY EARTH	EFFECTIVELY EARTH	EFFECTIVELY EARTH	NOT EARTHED	EFFECTIVELY EARTH

REV	DESCRIPTION	PREP.	CHKD.	APPD.	DATE
			SIGN.		
1	SECOND SUBMISSION (REVISED AS PER COMMENTS RECEIVED FROM AEGCL DATED. 23.12.24)	S.D.B	S.D.B	B.R	01.01.2025
0	FIRST SUBMISSION	S.D.B	S.D.B	B.R	13.11.2024

OWNER	ASSAM ELECTRICITY GRID CORPORATION LIMITED
EPC	TECHNO ELECTRIC & ENGINEERING COMPANY LIMITED
NOA :	AEGCL/MD/AIIB/400kv/Sonapur/Tender/PkgH/2023-24/Extn-2/71 Dtd: 13.09.2024
PROJECT :	CONSTRUCTION OF 400/220kV, GIS AT SONAPUR AND ASSOCIATED TRANSMISSION LINES AND BAY EXTENSION WORKS AT EXISTING 220kV SONAPUR GIS INCLUDING BAY AUGMENTATION AT SARUSAJAI GSS
SUBSTATION :	400/220kV GAS INSULATED SUBSTATION AT SONAPUR
DRG. TITLE	SONAPUR SS - SINGLE LINE DIAGRAM FOR NEW 400/220kV SUBSTATION AND 220kV GIS EXTENSION AT EXISTING SUBSTATION
DRG. NO. :	AEGCL-SONA-0816SN-ELE-SLD-001
SCALE : 1:1	JOB NO: 0816SN SHEET 2 OF 2

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Approved By GM (P&D)
Checked By DGM (P&D)
Checked By AGM (P&D)
Checked By DM (P&D)
Checked By AM (P&D)

APPROVED subject to the condition that the contractor shall be responsible for the correctness of the dimensions, fabrication, erection and performance of the equipment.