



400/220KV SUBSTATION OVERALL PLAN

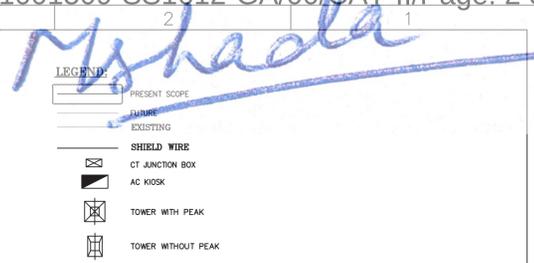
SPACE FOR UPCOMING KURAWAR CKT 1

SPACE FOR UPCOMING KURAWAR CKT 2

410 BAY

NEW HALF DIA NEEDS TO BE CONSTRUCTED

EXISTING RAPP 2 LINE BAY



NOTES:

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- ALL THE BUS HEIGHTS ARE REFERRED FROM TOP OF PLINTH LEVEL.
- PLINTH OF FOUNDATION WILL BE +350MM FROM THE FINISHED GROUND LEVEL (F.G.L.). GRAVEL TOP LEVEL WILL BE +100MM FROM THE F.G.L.
- SWITCHYARD PANEL ROOM CONSISTS OF FOLLOWING PANELS:
 - EXISTING 400V SWITCHYARD PANEL ROOM (SPR)-(AC KIOSK-4):
 - 400V CB RELAY PANEL
 - 400V TRANSFORMER PROTECTION PANEL
 - PTCC PANEL
 - NEW SWITCHYARD PANEL ROOM-SPR-11 (220KV):
 - 220KV C.B RELAY PANEL
- LM-3 & LM-4 ARE EXISTING.

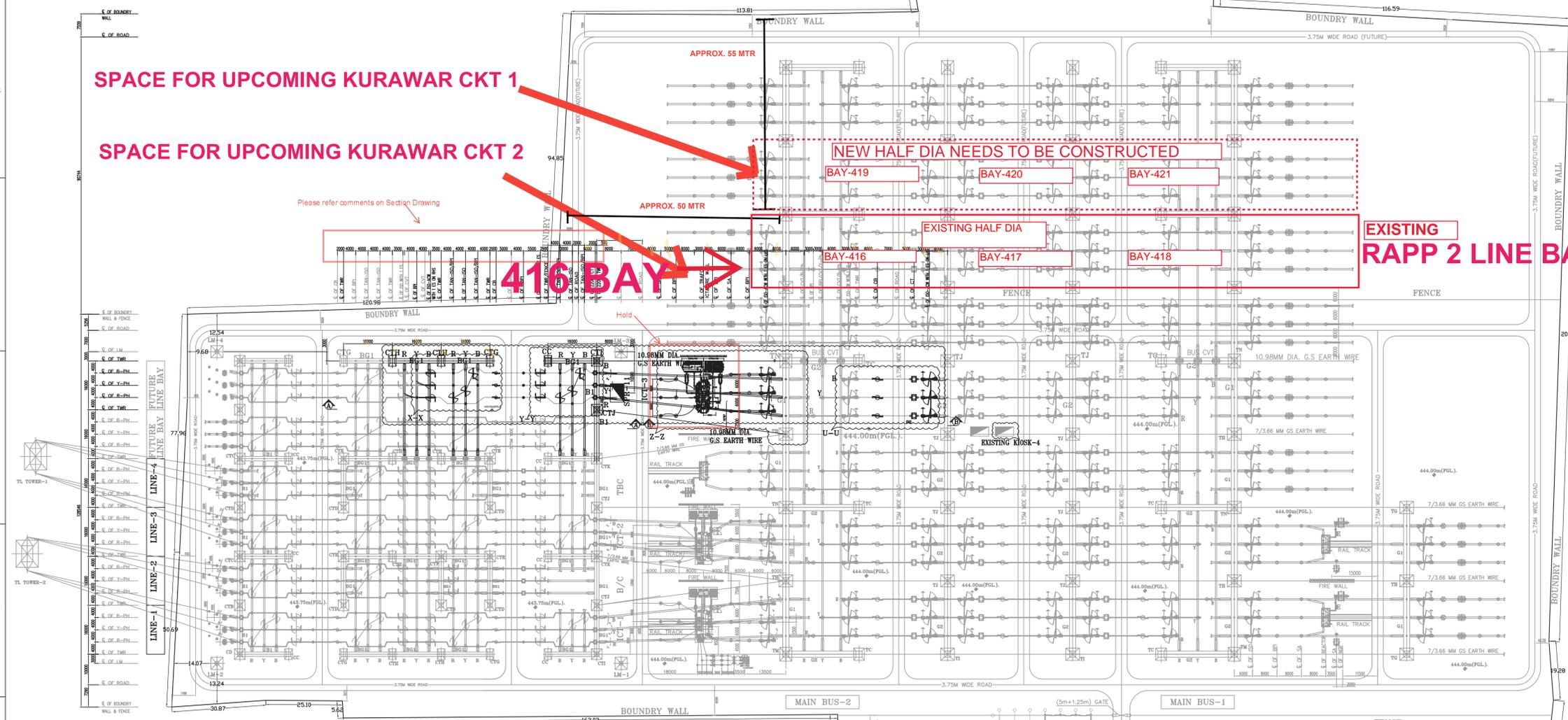
SYSTEM PARTICULARS :-	400KV	220KV
a) NOMINAL VOLTAGE	400KV	220KV
b) HIGHEST SYSTEM VOLTAGE	420KV	245KV
c) ONE MIN. POWER FREQUENCY WITHSTAND VOLTAGE (RMS)	630KV	460KV
d) BASIC IMPULSE WITHSTAND VOLTAGE (PEAK)	1550KV	1050KV
e) SHORT CIRCUIT LEVEL (KA)	40KA/1s	40KA/1s

PGCIL REFERENCE DRAWINGS:

- SUBSTATION OVERALL-PLAN (400/220KV SHUJALPUR NEW S/S): EC-ELE-0209-SUJ-1002
- GENERAL ARRANGEMENT EXTN. OF 400KV SHUJALPUR S/S: C/ENG-SS/WR/CT-II/SHUJALPUR/GA/01
- SINGLE LINE DIAGRAM OF Extn. of 400KV Shujalpur S/S: C/ENG-SS/WR/CT-II/SHUJALPUR/SLD/01
- STANDARD SWITCHYARD PANEL ROOM GENERAL ARRANGEMENT DETAIL OF PANEL ROOM: C/ENG/STD/PR/2017

TOSHIBA REFERENCE DRAWINGS:

- SHUJALPUR SUBSTATION-SINGLE LINE DIAGRAM: TR202112-1001509-SS1612-SLD



BOQ (420kV AIS EQUIPMENT):-

SL.NO	ITEM DESCRIPTION	AS PER BPS QUANTITY	AS PER LAYOUT QUANTITY
1	500MVA 400kV/220kV/33kV, 3-PHASE AUTOTRANSFORMER	1 NO.	1 NO.
2	420kV, 3150A, 40kA for 1 Sec., 3-PHASE, SP6 CIRCUIT BREAKER WITHOUT CLOSING RESISTOR	1 NO.	1 NO.
3	420kV, 3150A, 40kA for 1 Sec., 3-PHASE DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH	2 NOS.	2 NOS.
4	6 CORE CURRENT TRANSFORMER 1-PHASE, 420kV, 3000-2000-500/1A, 40kA for 1 Sec., CORE 1: Vk:3000-2000-500V, CI: PX CORE 2: Vk:3000-2000-500V, CI: PX CORE 3: CI:0.2S, BURDEN: 20VA CORE 4: CI:0.2S, BURDEN: 20VA CORE 5: Vk:3000-2000-500V, CI: PX CORE 6: Vk:3000-2000-500V, CI: PX	3	3
5	336kV, 20kA CLASS-IV 1-PHASE SURGE ARRESTOR	3 NOS.	3 NOS.
6	420kV, 1-PHASE BUS POST INSULATOR(EXCEPT FOR LINE TRAPS)	3 NOS.	3 NOS.

BOQ (245kV AIS EQUIPMENT):-

SL.NO	ITEM DESCRIPTION	AS PER BPS QUANTITY	AS PER LAYOUT QUANTITY
1	245kV, 1600A, 40kA for 1 Sec., 3-PHASE, SP6 CIRCUIT BREAKER	1 NO.	1 NO.
2	245kV, 1600A, 40kA for 1 Sec., 3-PHASE DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH	1 NO.	1 NO.
3	245kV, 1600A, 40kA for 1 Sec., 3-PHASE DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCH	1 NO.	1 NO.
4	245kV, 1600A, 40kA for 1 Sec., 3-PHASE DOUBLE BREAK TANDEM ISOLATOR WITHOUT EARTH SWITCH	2 NOS.	2 NOS.
5	5 CORE CURRENT TRANSFORMER 1-PHASE, 245kV, 1600-800/1A, 40kA for 1 Sec., CORE 1: Vk:1600-800V, CI: PX CORE 2: Vk:1600-800V, CI: PX CORE 3: 1600-800/1A, CI:0.2S, BURDEN: 20VA CORE 4: Vk:1600-800V, CI: PX CORE 5: Vk:1600-800V, CI: PX	3 NOS.	3 NOS.
6	216kV, 10kA CLASS-III 1-PHASE SURGE ARRESTOR	3 NOS.	3 NOS.
7	245kV, 1-PHASE BUS POST INSULATOR(EXCEPT FOR LINE TRAPS)	13 NOS.	14NOS.-11NOS. BPI+3NOS.HBPI

CONDUCTOR DETAILS:-

DESCRIPTION	FOR 400KV		FOR 220KV	
	HEIGHT (m) FROM PLINTH	CONDUCTOR TYPE	HEIGHT (m)	CONDUCTOR TYPE
A. EQUIPMENT BUS	8m	4' IPS AL TUBE	5.9m	4' IPS AL TUBE
B. MAIN BUS (EXISTING)	15m	4' IPS AL TUBE	11.7m	QUAD MOOSE ACSR
C. TRANSFER BUS	-	-	11.7m	TWIN MOOSE ACSR
D. JACK BUS	22m	TWIN MOOSE ACSR	16.2m	TWIN MOOSE ACSR
E. INTERCONNECTION JUMPERS	-	TWIN MOOSE ACSR	-	TWIN MOOSE ACSR
F. SHIELD WIRE	-	10.98mm DIA. G.S. WIRE	-	10.98mm DIA. G.S. WIRE

220KV CLEARANCES:-

DESCRIPTION	MINIMUM REQUIRED	SPACINGS ADOPTED
A. PHASE TO PHASE CLEARANCE	2100mm	4000mm
B. PHASE TO EARTH CLEARANCE	2100mm	4000mm
C. SECTIONAL CLEARANCE (SC)	5000mm	6800mm
D. GROUND CLEARANCE	5000mm	5900mm

BOQ : 220KV TOWERS & GANTRIES

DESCRIPTION	AS PER	
	BPS	LAYOUT
TOWERS WITHOUT PEAK(CTG)	02	01 NOS.
TOWERS WITHOUT PEAK(CTH)	02	02 NOS.
TOWERS WITHOUT PEAK(CC)	01	01 NOS.
TOWERS WITH PEAK(CTI)	01	01 NOS.
TOWERS WITH PEAK(CTJ)	01	01 NOS.
GIRDER-BG1	04	03 NOS.
GIRDER-B1	02	02 NOS.

400KV CLEARANCES:-

DESCRIPTION	MINIMUM REQUIRED	SPACINGS ADOPTED
A. PHASE TO PHASE CLEARANCE	4200mm	6000mm
B. PHASE TO EARTH CLEARANCE	3500mm	6000mm
C. SECTIONAL CLEARANCE (SC)	6500mm	8100mm
D. GROUND CLEARANCE	8000mm	8000mm

A	FOR APPROVAL	BS	AA / MVS	RK
Rev. No	Description	PRPD. BY:	CHK. BY:	APRD. BY:

CLIENT :	Power Grid Corporation of India Limited (A Government of India Enterprises)			
PROJECT:	Transformer Package TR 34 for: a) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Bhadra pooling S/S including associated bays, b) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Shujalpur S/S including associated bays, c) Extension of 220kV Shahjahanpur S/S, d) Implementation of 1X 80 MVAR, 765kV Spare Reactor at Bhadra S/S, e) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Konchi S/S, f) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Hiriyur S/S.			
LOA NO:	NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-I/NR1-150014 Dated:28/01/2022 for Supply Contract NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-I/NR1-150013 Dated:28/01/2022 for Services Contract			
SUBSTATION:	420/220kV SHUJALPUR SUBSTATION			
CONTRACTOR:	TOSHIBA Transmission & Distribution Systems (India) Pvt.Ltd			
Drawing No:	TR202112-1001509-SS1612-ELECT-LAY			
DATE:	PRPD. BY:	CHK. BY:	APRD. BY:	Sheet 1 of 2
10.03.2022	BS	AA / MVS	RK	
TITLE:	SHUJALPUR SUBSTATION - ELECTRICAL LAYOUT PLAN & SECTION			Rev No: A