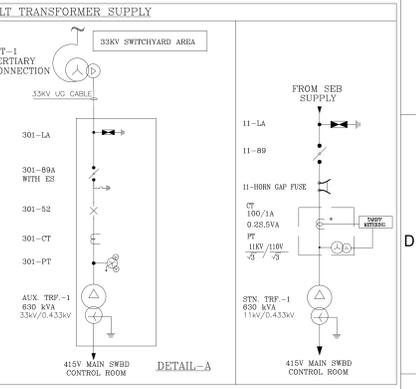


SL.NO	LEGEND	DESIGNATION KEY	DESCRIPTION	QUANTITY
01		403-ICT-1,406-ICT-2,409-ICT-3	AUTO TRANSFORMER 500 MVA 400/220/133kV WINDING: 1-1-1 AS PER CEA SPECIFICATION	03 Sets.
02		412-BR	125MVAR, 420kV, 3-PHASE, BUS REACTOR AS PER CEA SPECIFICATION	01 Set.
03		407-LR	80MVAR, 420kV, 3-PHASE, LINE SHUNT REACTOR AS PER CEA SPECIFICATION	02 Sets.
04		107-NGR 110-NGR	NEUTRAL GROUNDING REACTOR 145kV WITH BCT	02 Sets.
05		107-LA NGR, 110-LA NGR	120kV LIGHTNING ARRESTER, 10mA	02 Sets.
06		407-52,410-52	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, SF6 CIRCUIT BREAKER WITHOUT CSD	02 Sets.
07		402-52,403-52,405-52,406-52, 408-52,409-52,411-52,412-52	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, SF6 CIRCUIT BREAKER WITH CSD	08 Sets.
08		401-89A 403-89B	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	02 Sets.
09		402-89A,402-89B,403-89A,403-89B, 403-891,403-89A,403-89B,404-89A,404-89B, 406-89A,406-89B,407-89A,407-89B,407-89A, 407-89A,407-89B,408-89A,408-89B,409-89A,409-89B, 409-891,410-89A,410-89B,410-89A,410-89B, 411-89A,411-89B,412-89A,412-89B,412-89A,412-89B	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH ONE MOTORIZED EARTH SWITCH	28 Sets.
10		402-CT,403-CT,405-CT,406-CT,407-CT, 408-CT,409-CT,410-CT,411-CT,412-CT	CURRENT TRANSFORMER 420kV, 6 CORE, 1 PH 3000-2000-500/1A, 63kA for 1 Sec.	30 Nos.
11		407-CVT,410-CVT 400-BCVT-1,400-BCVT-II	CAPACITOR VOLTAGE TRANSFORMER, 420kV 3 CORE, 4400/8800 pF	12 Nos.
12		407-LA,407-LAR 410-LA,410-LAR	336kV, 20kA, CLASS II, 1-PHASE, SURGE ARRESTER	24 Nos.
13		407-WT,410-WT	420kV, 3150A, 10mA, 1-PHASE, WAVE TRAP(R & Y-Ph)	04 Nos.

SL.NO	LEGEND	DESIGNATION KEY	DESCRIPTION	QUANTITY
01		211-52	245kV, 3150A, 50kA for 1 sec., 3-PHASE, SF6 CIRCUIT BREAKER	01 Set.
02		201-52,202-52,203-52,204-52,205-52, 206-52,207-52,208-52,209-52,210-52	245kV, 1600kVA, 50kA for 1 sec., 3-PHASE, SF6 CIRCUIT BREAKER	10 Sets.
03		211-89A,211-89B	245kV, 3150A, 50kA for 1 sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	02 Sets.
04		201-89A,202-89A,203-89A,204-89A, 205-89A,206-89A,207-89A,208-89A, 209-89A,210-89A	245kV, 1600kVA, 50kA for 1 sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	10 Sets.
05		201-89B,202-89B,203-89B,204-89B, 205-89B,206-89B,207-89B,208-89B, 209-89B,210-89B	245kV, 1600kVA, 50kA for 1 sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	10 Sets.
06		201-CVT,202-CVT,203-CVT,204-CVT, 205-CVT,206-CVT,207-CVT,208-CVT, 209-CVT,210-CVT	CURRENT TRANSFORMER 245kV, 3150A, 50kA for 1 sec., 1-PHASE,	30 Nos.
07		201-CVT,202-CVT,203-CVT,204-CVT, 205-CVT,206-CVT,207-CVT,208-CVT, 209-CVT,210-CVT	CAPACITOR VOLTAGE TRANSFORMER 245kV, 4400/8800 pF, 1-PHASE,	24 Nos.
08		201-LA,202-LA,203-LA,204-LA,205-LA, 206-LA,207-LA,208-LA,209-LA,210-LA	216kV, 10kA, CLASS II, 1-PHASE, SURGE ARRESTER	27 Nos.
09		201-WT,202-WT,203-WT,204-WT,205-WT, 206-WT	245kV, 1600kVA, 50kVA, 1-PHASE, WAVE TRAP(R & B-Ph)	12 Nos.

SL.NO	DESCRIPTION OF PARAMETERS	400kV SYSTEM	220kV SYSTEM
01	NOMINAL SYSTEM VOLTAGE	400 kV	220 kV
02	HIGHEST SYSTEM VOLTAGE	420 kV	245 kV
03	ONE MINUTE POWER FREQUENCY DRY & WET WITHSTAND VOLTAGE (kV rms)	DRY-630 WET-660	460 kV
04	BASIC INSULATION LEVEL	EQUIPMENT-1425 kV INSULATOR-1550 kV	EQUIPMENT-1050 kV INSULATOR-1050 kV
05	SYSTEM FAULT LEVEL	63kA for 1Sec.	50kA for 1Sec.
06	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED.	EFFECTIVELY EARTHED.
07	SYSTEM FREQUENCY	50 Hz	50 Hz
08	AMBIENT TEMPERATURE	50° C.	50° C.
09	MINIMUM CLEARANCE		
10	CREEAGE DISTANCE FOR EQUIPMENT AND OUTDOOR BUSHINGS	25mm / kV (1025mm) 31mm / kV (1302mm)	25mm / kV (1125mm) 31mm / kV (1302mm)
11	BUS CONFIGURATION	ONE & HALF BREAKER (MS)	DOUBLE MAIN AND TRANSFER (MS)
12	BAY WIDTH FOR SUBSTATION	24000mm	16000mm
13	NO. OF PHASES	3	3

SL.NO	SYMBOL	EQUIPMENT	DESCRIPTION	QUANTITY
01		301-CT	72.5kV CURRENT TRANSFORMER 50/1-1A	03 Nos.
02		301-AUX. TRF.	STATION TRANSFORMER(OUTDOOR) 630kVA, 33/0.433kV	01 No.
03		301-89A	72.5kV,630A,25kA FOR 3 SEC DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH	02 Sets.
04		301-52	72.5kV,1250A,25kA FOR 3 SEC CIRCUIT BREAKER	01 Set.
05		301-PT	72.5 kV VOLTAGE TRANSFORMER (1-PHASE)	03 Nos.
06		301-LA	42kV 10kA CLASS-3 SURGE ARRESTORS (1-PHASE)	03 Nos.



G R INFRAPROJECTS LIMITED
SECTOR-18, GURUGRAM (122015)
RAJGARH TRANSMISSION LTD. (400/220kV PACHORA SEZ/PP S/S)

Approval status: APPROVED

A: APPROVED
B: APPROVED SUBJECT TO INCORPORATION OF COMMENTS
C: RESUBMIT FOR APPROVAL AFTER INCORPORATING COMMENTS
D: FOR INFORMATION & RECORD
E: NOT APPROVED

THIS APPROVAL SHALL NOT RELIEVE THE CONTRACTOR FROM ITS CONTRACTUAL OBLIGATIONS

DATE: 18.08.2022 SIGN: *[Signature]*

REF. DRG. NO.	DESCRIPTION	LEGEND:	REVISION	DATE	DRAWN	ELECT.	PM	APPROVED	STATUS
1	1. REFERENCE PROTECTION SINGLE LINE DIAGRAM - REC/RERA/E-SYD/001	<p>PRESENT SCOPE</p> <p>FUTURE</p> <p>BUS BAR PRESENT</p> <p>BUS BAR FUTURE</p>	R1	REVISED AS PER COMMENTS	09.08.22	G.M	M.S		FOR APPROVAL
			RO	FIRST ISSUE	20.06.22	G.M	P.I		FOR APPROVAL
									CHECKED
									APPROVED

CUSTOMER: RAJGARH TRANSMISSION LIMITED

OWNER'S ENGINEER: KNR ENGINEERS (INDIA) PVT. LTD.

CONSULTANT: KNR ENGINEERS (INDIA) PVT. LTD.

PROJECT: TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM RE PROJECTS IN RAJGARH (2500MW) SEZ IN MADHYA PRADESH

REF NO: RECPDCL/TBCB/RAJGARH/2021-2022/3333 DATED-31.03.2022

TITLE: SINGLE LINE DIAGRAM FOR 400kV/220kV SWITCHYARD RAJGARH S/S

CLIENT: G R INFRAPROJECTS LTD.
2nd Floor, Navas Tower, Plot No. 18, Phase-IV, Udyog Vihar, Sector-18, Gurugram, Haryana-122015, India.

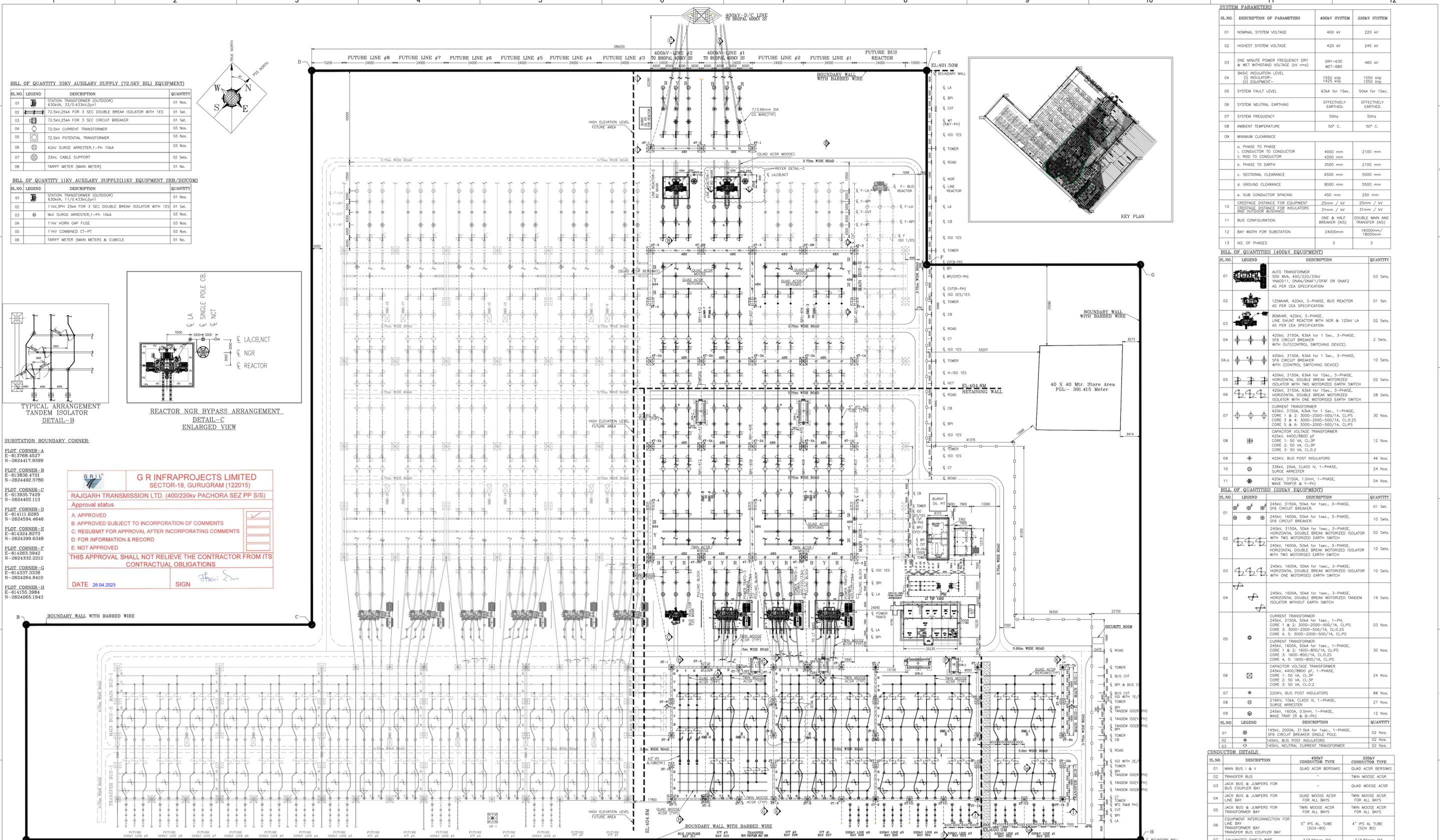
DRAWING No. REC/RERA/E-SYD/002

SHEET 01 OF 01

SCALE 1:2

DATE: 09.08.22

Size: A0 (1189 x 841)

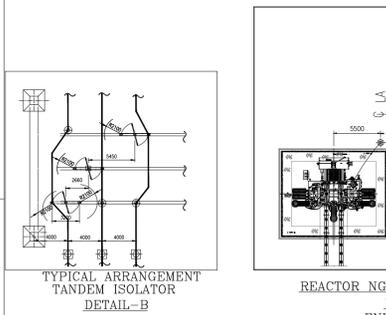


BILL OF QUANTITY 33KV AUXILIARY SUPPLY (72.5KV BIL EQUIPMENT)

SL.NO	LEGEND	DESCRIPTION	QUANTITY
01	STATION TRANSFORMER (OUTDOOR) 630kVA, 11/0.433kV/0.415kV	01 Nos.	
02	72.5kV/25kA FOR 3 SEC DOUBLE BREAK ISOLATOR WITH 1ES	01 Set.	
03	72.5kV/25kA FOR 3 SEC CIRCUIT BREAKER	01 Set.	
04	72.5kV CURRENT TRANSFORMER	03 Nos.	
05	72.5kV POTENTIAL TRANSFORMER	03 Nos.	
06	42kV SURGE ARRESTER, 1-Ph. 10kA	03 Nos.	
07	33kV CABLE SUPPORT	02 Sets.	
08	TARIFF METER (MAIN METER)	01 No.	

BILL OF QUANTITY 11KV AUXILIARY SUPPLY (11KV EQUIPMENT SBE/DISCOM)

SL.NO	LEGEND	DESCRIPTION	QUANTITY
01	STATION TRANSFORMER (OUTDOOR) 630kVA, 11/0.433kV/0.415kV	01 Nos.	
02	11kV/3Ph 25kA FOR 3 SEC DOUBLE BREAK ISOLATOR WITH 1ES	01 Set.	
03	9kV SURGE ARRESTER, 1-Ph. 10kA	03 Nos.	
04	11kV HORN GAP FUSE	03 Nos.	
05	11kV COMBINED CT-PT	03 Nos.	
06	TARIFF METER (MAIN METER) & CUBICLE	01 No.	



SUBSTATION BOUNDARY CORNER:

PLOT CORNER-A
 E-613768.4527
 N-2624417.9399
 PLOT CORNER-B
 E-613936.4721
 N-2624492.5790
 PLOT CORNER-C
 E-613935.7429
 N-2624402.1113
 PLOT CORNER-D
 E-614111.0295
 N-2624594.4646
 PLOT CORNER-E
 E-614324.8273
 N-2624399.6348
 PLOT CORNER-F
 E-614263.3942
 N-2624332.2212
 PLOT CORNER-G
 E-614337.3338
 N-2624264.8410
 PLOT CORNER-H
 E-614155.3064
 N-2624065.1943

G R I L
G R INFRAPROJECTS LIMITED
 SECTOR-18, GURUGRAM (122015)

RAJGARH TRANSMISSION LTD. (400/220kV PACHORA SEZ PP S/S)

Approval status

A: APPROVED
 B: APPROVED SUBJECT TO INCORPORATION OF COMMENTS
 C: RESUBMIT FOR APPROVAL AFTER INCORPORATING COMMENTS
 D: FOR INFORMATION & RECORD
 E: NOT APPROVED

THIS APPROVAL SHALL NOT RELIEVE THE CONTRACTOR FROM ITS CONTRACTUAL OBLIGATIONS

DATE: 28.04.2023 SIGN: [Signature]

SYSTEM PARAMETERS

SL.NO	DESCRIPTION OF PARAMETERS	400kV SYSTEM	220kV SYSTEM
01	NOMINAL SYSTEM VOLTAGE	400 kV	220 kV
02	HIGHEST SYSTEM VOLTAGE	420 kV	245 kV
03	ONE MINUTE POWER FREQUENCY DRY & WET WITHSTAND VOLTAGE (kV rms)	DRY-630 WET-680	460 kV
04	BASIC INSULATION LEVEL (i) INSULATOR, (ii) EQUIPMENT-	1550 kVp 1425 kVp	1050 kVp 1050 kVp
05	SYSTEM FAULT LEVEL	63kA for 1Sec.	50kA for 1Sec.
06	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED.	EFFECTIVELY EARTHED.
07	SYSTEM FREQUENCY	50Hz	50Hz
08	AMBIENT TEMPERATURE	50° C.	50° C.
09	MINIMUM CLEARANCE		
	a. PHASE TO PHASE		
i.	CONDUCTOR TO CONDUCTOR	4000 mm	2100 mm
ii.	ROD TO CONDUCTOR	4200 mm	
b.	PHASE TO EARTH	3500 mm	2100 mm
c.	SECTIONAL CLEARANCE	6500 mm	5000 mm
d.	GROUND CLEARANCE	8000 mm	5500 mm
e.	SUB CONDUCTOR SPACING	450 mm	250 mm
10	CREEPAGE DISTANCE FOR EQUIPMENT	25mm / kV	25mm / kV
	INSULATORS AND OUTDOOR BUSHINGS	31mm / kV	31mm / kV
11	BUS CONFIGURATION	ONE & HALF TRANSFER (ANS)	DOUBLE MAIN AND TRANSFER (ANS)
12	RAY WIDTH FOR SUBSTATION	2400mm	1600mm/1800mm
13	NO. OF PHASES	3	3

BILL OF QUANTITIES (400KV EQUIPMENT)

SL.NO	LEGEND	DESCRIPTION	QUANTITY
01	TRANSFORMER	AUTO TRANSFORMER 500 MVA, 400/220/33kV YN0D11, ONAN/ONAF/ONAF OR ONAF2 AS PER CEA SPECIFICATION	03 Sets.
02	REACTOR	125MVAR, 420kV, 3-PHASE, BUS REACTOR AS PER CEA SPECIFICATION	01 Set.
03	REACTOR	80MVAR, 420kV, 3-PHASE, LINE SHUNT REACTOR WITH NGR & 120kV LA AS PER CEA SPECIFICATION	02 Sets.
04	ISOLATOR	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, SF6 CIRCUIT BREAKER WITH OUT(CONTROL SWITCHING DEVICE)	2 Sets.
04a	ISOLATOR	420kV, 3150A, 63kA for 1 Sec., 3-PHASE, SF6 CIRCUIT BREAKER WITH (CONTROL SWITCHING DEVICE)	10 Sets.
05	ISOLATOR	420kV, 3150A, 63kA for 15sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	02 Sets.
06	ISOLATOR	420kV, 3150A, 63kA for 15sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH ONE MOTORIZED EARTH SWITCH	28 Sets.
07	TRANSFORMER	CURRENT TRANSFORMER 420kV, 3150A, 63kA for 1 Sec., 1-PHASE, CORE 1 & 2: 3000-2000-500/1A, CLIPS CORE 3 & 4: 3000-2000-500/1A, CLIPS CORE 5 & 6: 3000-2000-500/1A, CLIPS	30 Nos.
08	TRANSFORMER	CAPACITOR VOLTAGE TRANSFORMER 420kV, 4400/8800 pF, 1-PHASE, CORE 1: 50 VA, CL-3P CORE 2: 50 VA, CL-3P CORE 3: 50 VA, CL-2	12 Nos.
09	ISOLATOR	420kV, BUS POST INSULATORS	46 Nos.
10	ISOLATOR	33kV, 20kA, CLASS IV, 1-PHASE, SURGE ARRESTER	24 Nos.
11	ISOLATOR	420kV, 3150A, 1.0mm, 1-PHASE, WAVE TRAP (1-Ph)	04 Nos.

BILL OF QUANTITIES (220KV EQUIPMENT)

SL.NO	LEGEND	DESCRIPTION	QUANTITY
01	ISOLATOR	245kV, 3150A, 50kA for 1sec., 3-PHASE, SF6 CIRCUIT BREAKER	01 Set.
02	ISOLATOR	245kV, 1600A, 50kA for 1sec., 3-PHASE, SF6 CIRCUIT BREAKER	10 Sets.
02	ISOLATOR	245kV, 3150A, 50kA for 1sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	02 Sets.
03	ISOLATOR	245kV, 1600A, 50kA for 1sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH TWO MOTORIZED EARTH SWITCH	10 Sets.
03	ISOLATOR	245kV, 1600A, 50kA for 1sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED ISOLATOR WITH ONE MOTORIZED EARTH SWITCH	10 Sets.
04	ISOLATOR	245kV, 1600A, 50kA for 1sec., 3-PHASE, HORIZONTAL DOUBLE BREAK MOTORIZED TANDEM ISOLATOR WITHOUT EARTH SWITCH	19 Sets.
05	TRANSFORMER	CURRENT TRANSFORMER 245kV, 3150A, 50kA for 1sec., 1-Ph, CORE 1 & 2: 3000-2000-500/1A, CLIPS CORE 3: 3000-2000-500/1A, CLIPS CORE 4: 3000-2000-500/1A, CLIPS	03 Nos.
06	TRANSFORMER	CAPACITOR VOLTAGE TRANSFORMER 245kV, 4400/8800 pF, 1-PHASE, CORE 1: 50 VA, CL-3P CORE 2: 50 VA, CL-3P CORE 3: 50 VA, CL-2	24 Nos.
07	ISOLATOR	220kV, BUS POST INSULATORS	88 Nos.
08	ISOLATOR	216kV, 10kA, CLASS III, 1-PHASE, TANDEM ISOLATOR (PH)	27 Nos.
09	ISOLATOR	245kV, 1600A, 0.5mm, 1-PHASE, WAVE TRAP (1-Ph)	12 Nos.

CONDUCTOR DETAILS

SL.NO	DESCRIPTION	400KV CONDUCTOR TYPE	220KV CONDUCTOR TYPE
01	MAIN BUS I & II	QUAD ACSR BERSIMS	QUAD ACSR BERSIMS
02	TRANSFER BUS	-	TWIN MOOSE ACSR
03	JACK BUS & JUMPERS FOR BUS COUPLER BAY	-	QUAD MOOSE ACSR
04	JACK BUS & JUMPERS FOR LINE BAY	QUAD MOOSE ACSR FOR ALL BAYS	TWIN MOOSE ACSR FOR ALL BAYS
05	JACK BUS & JUMPERS FOR TRANSFORMER BAY	TWIN MOOSE ACSR FOR ALL BAYS	TWIN MOOSE ACSR FOR ALL BAYS
06	EQUIPMENT INTERCONNECTION FOR LINE BAY TRANSFORMER BAY	5" IPS AL TUBE (SCH-80)	4" IPS AL TUBE (SCH-80)
07	GALVANIZED SHIELD WIRE	7/3.66mm DIA	7/3.66mm DIA
08	400kV INCOMING LINE	QUAD/TWIN HTLS	TWIN MOOSE

- 400/220kV PROTECTION SINGLE LINE DIAGRAM FOR RAJGARH S/S- REC/RERA/E-SYD/001
- CONTROL ROOM PANEL ARRANGEMENT LAYOUT FOR RAJGARH S/S- REC/RERA/E-SYD/004
- SWITCHYARD PANEL ROOM DRAWING FOR RAJGARH S/S- REC/RERA/E-SYD/005
- 1" HOD LAYOUT-AUXILIARY SYSTEM (72.5kV, 33kV, 11kV) REC/RERA-E-SYD-026
- PILING LAYOUT OF FIRE WATER HEADER 30P-GRIL-RAJ-D-01

LEGEND:

- PRESENT SCOPE
- FUTURE
- GALVANIZED SHIELD WIRE
- BOUNDARY WALL
- ELEVATION LEVEL
- 400KV SPR-2nas
- 220KV SPR-4nas
- SWITCHYARD PANEL ROOM
- PERIPHERAL & BOUNDARY LINE
- STONE PITCHING

- NOTES:**
- ALL DIMENSION ARE IN MM & COORDINATES ARE IN METERS.
 - LAYS & OTHER EQUIPMENTS COMING IN WITHDRAWAL DIRECTION OF TRANSFORMER & REACTOR SHALL HAVE REMOVABLE TYPE SUPPORT STRUCTURE.
 - LOCATION OF LINE EQUIPMENTS SHOWN ARE CONSIDERING TOWER WITHOUT ANY DEVIATION SITE. MAY CHANGE THE LINE EQUIPMENT POSITION DEPENDING END TOWER LOCATION (AS PER ACTUAL).
 - LOCATION OF DEAD END GANTRY TO BE FINALISED BY CUSTOMER'S/IL CONTRACTOR.
 - TRANSFORMER & REACTOR DETAILS LAYOUT/NFPPS WILL BE SUBMITTED SEPARATELY.
 - BURNIT OIL PHT, SPR, BMG, FFPH, DC SET & FIRE WATER STORAGE SECURITY ROOM ARE INDICATIVE. IT WILL BE FINALISED DURING DESIGN ENGINEERING.
 - CANTILEVER STRENGTH OF POST INSULATORS/REQUIREMENT SHALL BE AS PER APPROVED CALCULATION.
 - CONDUCTOR PARAMETERS SHALL BE AS PER APPROVED CONDUCTOR SIZING CALCULATION.
 - PERIPHERAL AND BOUNDARY WALL SHALL BE AS PER CIVIL DESIGN OF FOUNDATION/RETAINING WALL.
 - RETAINING WALL AND STONE PITCHING DETAILS, REFER CIVIL RESPECTIVE DETAIL DRAWINGS.
 - PHASE SEQUENCE RAY PH FOR WAVE TRAP WILL BE FINALISED AS PER REQUIREMENT.
 - REINFORCE END 400KV RHOPAL SS SHALL HAVE PROVISION FOR WAVE TRAP MOUNTING.
 - EQUIPMENT GA SHALL BE TENTATIVE. IT WILL BE FINALISED AS PER OEM DRAWINGS.
 - ROADS SHALL BE CONSTRUCTED BY SUITABLE SLOPE ARRANGEMENT.
 13. ROAD POND IS AVAILABLE IN 400KV SIDE COORDINATES (E14354.62 m E, 2624337.51 m N).

REV.	DESCRIPTION	DRAWN	ELECT.	PM	CHECKED	APPROVED	STATUS
R6	REVISED AS PER COMMENTS	Name M.S	P.J				FOR APPROVAL
		Date 17.04.23	17.04.23				
R6	REVISED AS PER COMMENTS	Name G.K	M.S				FOR APPROVAL
		Date 20.02.23	20.02.23				
R5	REVISED AS PER COMMENTS	Name G.K	M.S				FOR APPROVAL
		Date 22.11.22	22.11.22				
R4	FOR APPROVAL	Name G.K	M.S				FOR APPROVAL
		Date 11.11.22	11.11.22				
R3	FOR APPROVAL	Name G.K	M.S				FOR APPROVAL
		Date 14.10.22	14.10.22				
R2	FOR APPROVAL	Name S.V	M.S				FOR APPROVAL
		Date 09.08.22	09.08.22				

CUSTOMER: RAJGARH TRANSMISSION LIMITED

OWNER'S ENGINEER CONSULTANT: KNR ENGINEERS (INDIA) PVT. LTD.

PROJECT: TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM RE PROJECTS IN RAJGARH(2500MW) SEZ IN MADHYA PRADESH

REF NO: RECPDCL/TBCB/RAJGARH/2021-2022/3333 DATED-31.03.2022

TITLE: ELECTRICAL LAYOUT PLAN & SECTIONS-400kV & 220kV SWITCHYARD

CLIENT: G R I L
 2nd Floor, Novus Tower, Plot No. 18, Phase-IV, Udyog Vihar, Sector-18, Gurugram, Haryana-120015, India.

DRAWING No.: REC/RERA/E-SYD/PLAN-SEC-003

SHEET: 01 OF 03

SCALE: 1:500

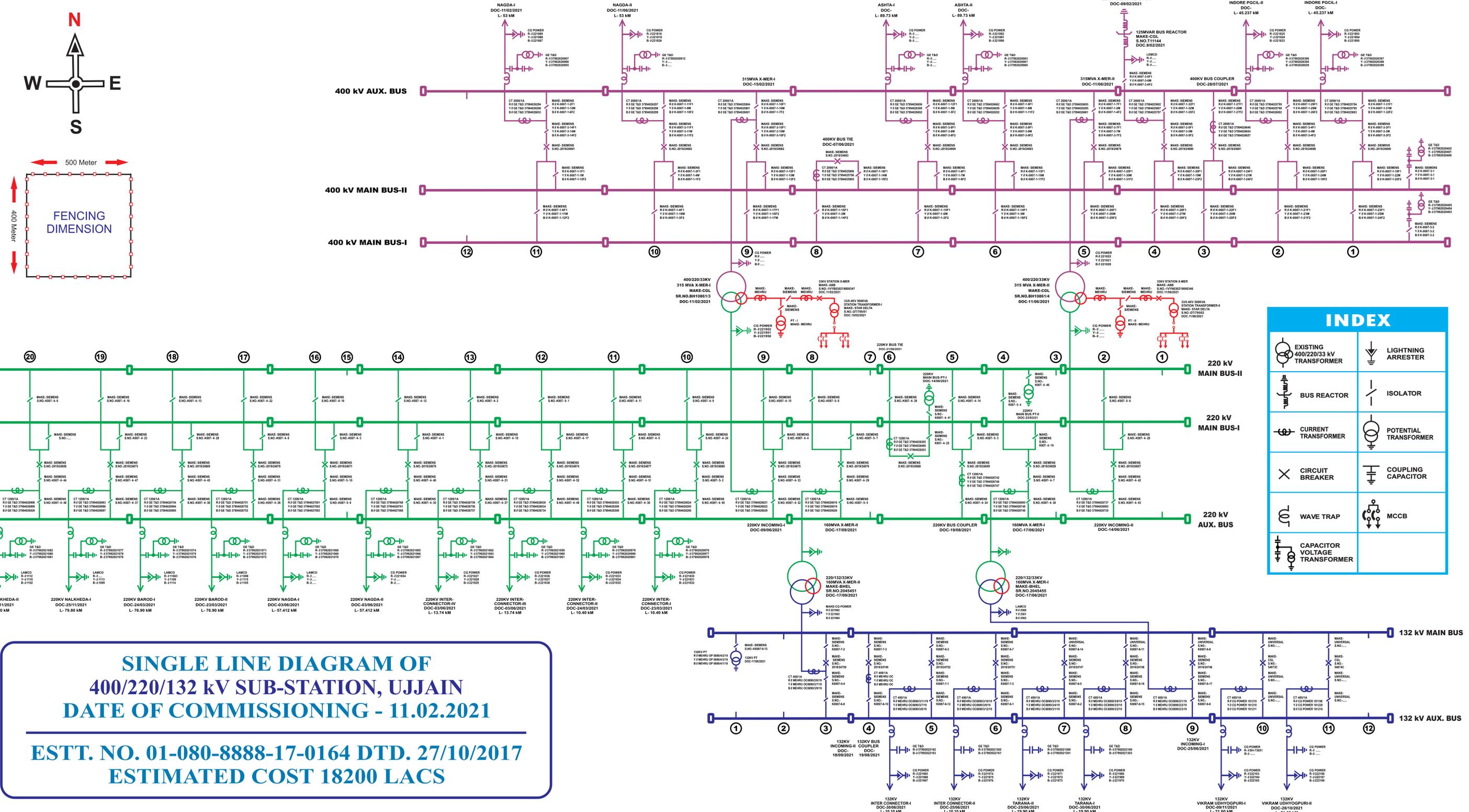
DATE: 17.04.23



M.P. POWER TRANSMISSION CO. LTD.

(Wholly owned by Government of Madhya Pradesh)

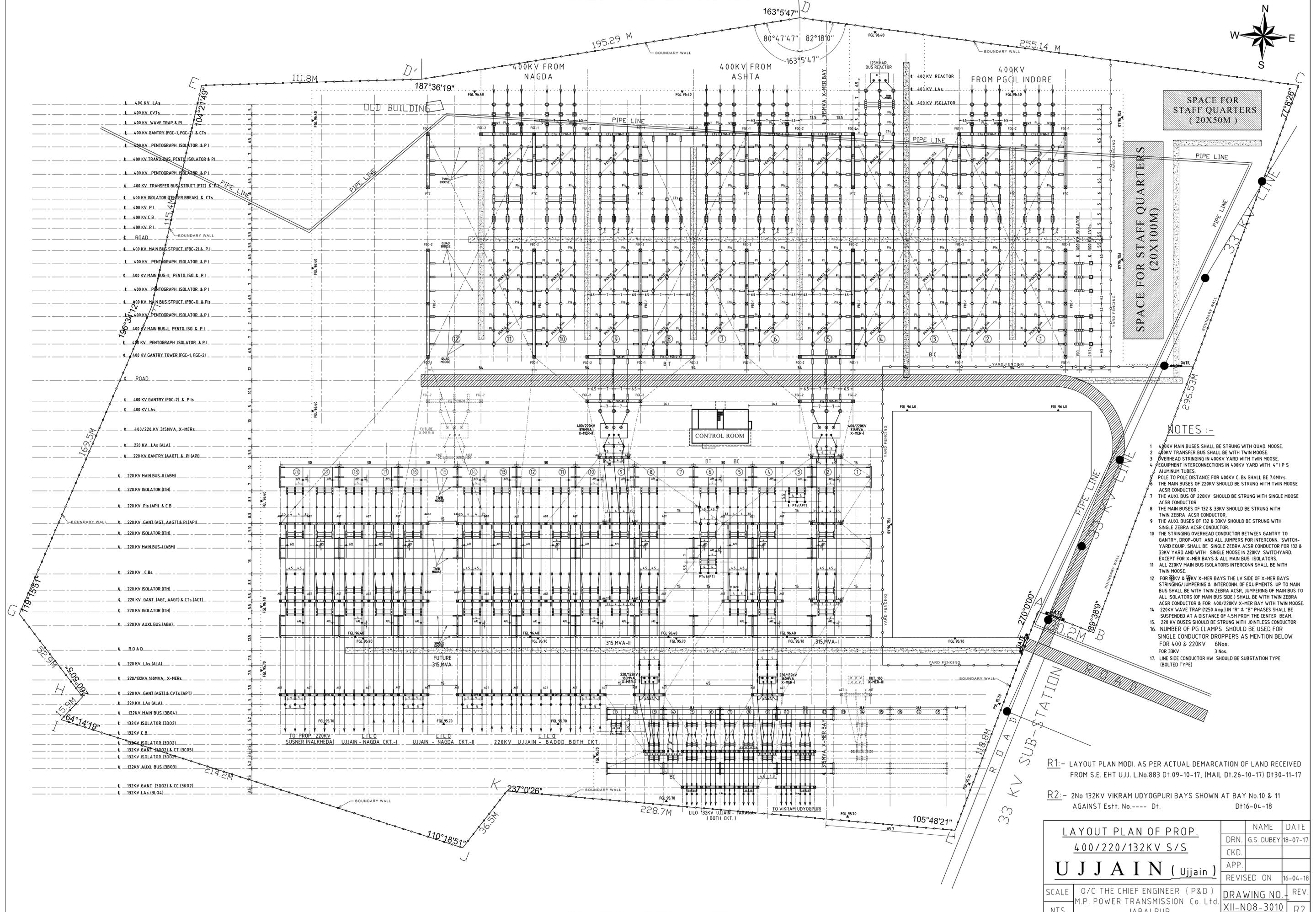
400/220/132 kV SUB-STATION, UJJAIN



INDEX	
	LIGHTNING ARRESTER
	ISOLATOR
	POTENTIAL TRANSFORMER
	COUPLING CAPACITOR
	MCCB

**SINGLE LINE DIAGRAM OF
400/220/132 kV SUB-STATION, UJJAIN
DATE OF COMMISSIONING - 11.02.2021**

**ESTT. NO. 01-080-8888-17-0164 DTD. 27/10/2017
ESTIMATED COST 18200 LACS**



PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

SPACE FOR STAFF QUARTERS (20X50M)

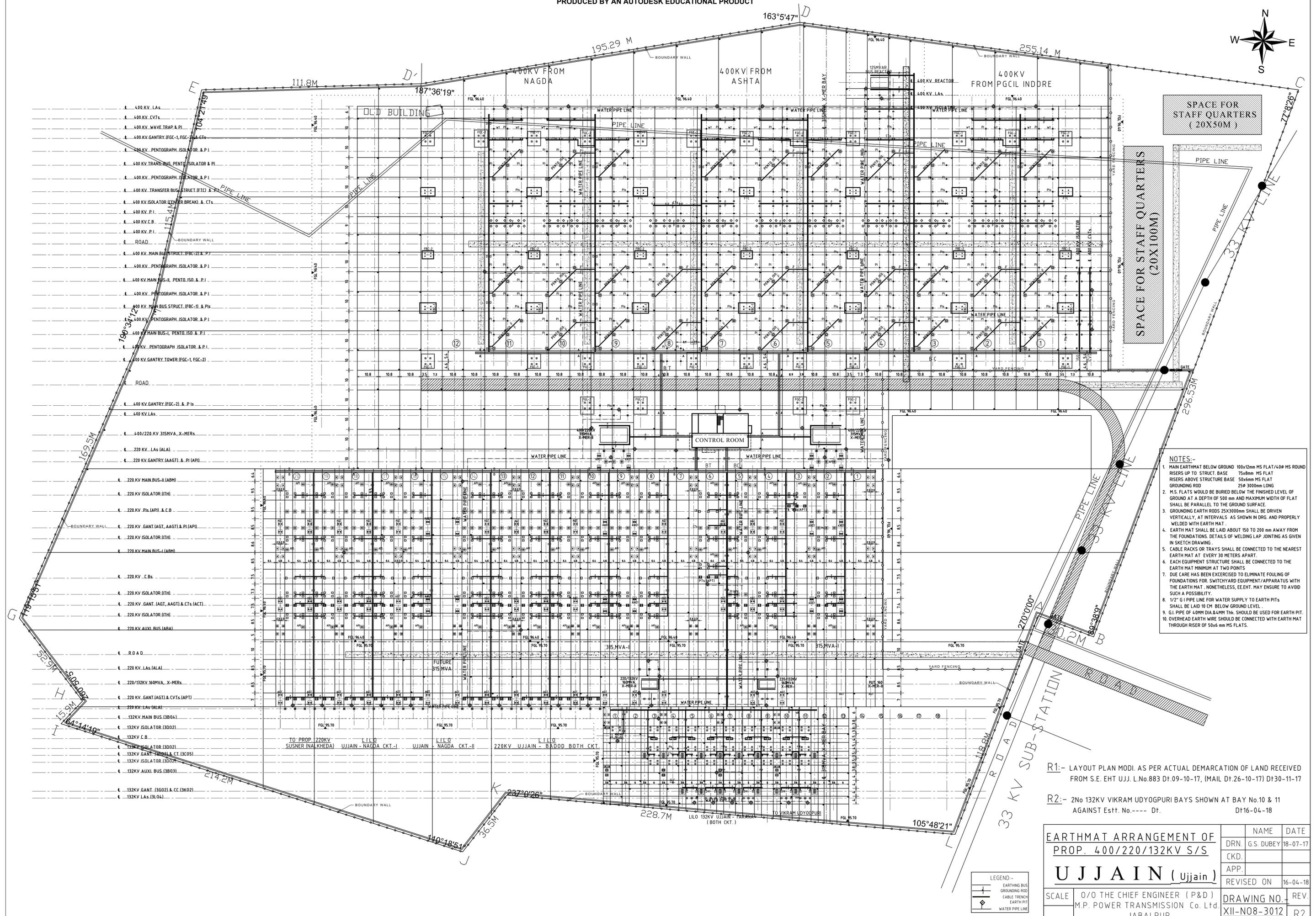
SPACE FOR STAFF QUARTERS (20X100M)

NOTES :-

- 400KV MAIN BUSES SHALL BE STRUNG WITH QUAD. MOOSE.
- 400KV TRANSFER BUS SHALL BE WITH TWIN MOOSE.
- OVERHEAD STRINGING IN 400KV YARD WITH TWIN MOOSE.
- EQUIPMENT INTERCONNECTIONS IN 400KV YARD WITH 4" I.P.S ALUMINIUM TUBES.
- POLE TO POLE DISTANCE FOR 400KV C. BS SHALL BE 7.0Mtrs.
- THE MAIN BUSES OF 220KV SHOULD BE STRUNG WITH TWIN MOOSE ACSR CONDUCTOR.
- THE AUXI. BUS OF 220KV SHOULD BE STRUNG WITH SINGLE MOOSE ACSR CONDUCTOR.
- THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH TWIN ZEBRA ACSR CONDUCTOR.
- THE AUXI. BUSES OF 132 & 33KV SHOULD BE STRUNG WITH SINGLE ZEBRA ACSR CONDUCTOR.
- THE STRINGING OVERHEAD CONDUCTOR BETWEEN GANTRY TO GANTRY, DROP-OUT AND ALL JUMPERS FOR INTERCONN. SWITCH-YARD EQUIP. SHALL BE SINGLE ZEBRA ACSR CONDUCTOR FOR 132 & 33KV YARD AND WITH SINGLE MOOSE IN 220KV SWITCHYARD EXCEPT FOR X-MER BAYS & ALL MAIN BUS ISOLATORS.
- ALL 220KV MAIN BUS ISOLATORS INTERCONN SHALL BE WITH TWIN MOOSE.
- FOR 33KV & 132KV X-MER BAYS THE LV SIDE OF X-MER BAYS STRINGING/JUMPERING & INTERCONN. OF EQUIPMENTS UP TO MAIN BUS SHALL BE WITH TWIN ZEBRA ACSR. JUMPERING OF MAIN BUS TO ALL ISOLATORS (OF MAIN BUS SIDE) SHALL BE WITH TWIN ZEBRA ACSR CONDUCTOR & FOR 400/220KV X-MER BAY WITH TWIN MOOSE.
- 220KV WAVE TRAP (250 Amp.) IN "R" & "B" PHASES SHALL BE SUSPENDED AT A DISTANCE OF 4.5M FROM THE CENTER BEAM.
- 220 KV BUSES SHOULD BE STRUNG WITH JOINTLESS CONDUCTOR.
- NUMBER OF PG CLAMPS SHOULD BE USED FOR SINGLE CONDUCTOR DROPPERS AS MENTION BELOW FOR 400 & 220KV 6Nos. FOR 33KV 3 Nos.
- LINE SIDE CONDUCTOR HW SHOULD BE SUBSTATION TYPE (BOLTED TYPE)

- R1:- LAYOUT PLAN MODI. AS PER ACTUAL DEMARICATION OF LAND RECEIVED FROM S.E. EHT UJJ. L.No.883 Dt.09-10-17, (MAIL Dt.26-10-17) Dt.30-11-17
- R2:- 2No 132KV VIKRAM UDYOGPURI BAYS SHOWN AT BAY No.10 & 11 AGAINST Estt. No.---- Dt. Dt16-04-18

LAYOUT PLAN OF PROP.		NAME	DATE
400/220/132KV S/S		DRN. G.S. DUBEY	18-07-17
UJJAIN (Ujjain)		CKD.	
		APP.	
		REVISED ON	16-04-18
SCALE	0/0 THE CHIEF ENGINEER (P&D) M.P. POWER TRANSMISSION Co. Ltd. JABALPUR	DRAWING NO.	REV.
NTS		XII-N08-3010	R2



PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

SPACE FOR STAFF QUARTERS (20X50M)

SPACE FOR STAFF QUARTERS (20X100M)

- NOTES:-
1. MAIN EARTH MAT BELOW GROUND 100x12mm MS FLAT/40# MS ROUND RISERS UP TO STRUCT. BASE 75x8mm MS FLAT RISERS ABOVE STRUCTURE BASE 50x6mm MS FLAT GROUNDING ROD 25# 3000mm LONG
 2. M.S. FLATS WOULD BE BURIED BELOW THE FINISHED LEVEL OF GROUND AT A DEPTH OF 500 mm AND MAXIMUM WIDTH OF FLAT SHALL BE PARALLEL TO THE GROUND SURFACE
 3. GROUNDING EARTH RODS 25X3000mm SHALL BE DRIVEN VERTICALLY, AT INTERVALS AS SHOWN IN DRG. AND PROPERLY WELDED WITH EARTH MAT.
 4. EARTH MAT SHALL BE LAID ABOUT 150 TO 200 mm AWAY FROM THE FOUNDATIONS. DETAILS OF WELDING LAP JOINTING AS GIVEN IN SKETCH DRAWING.
 5. CABLE RACKS OR TRAYS SHALL BE CONNECTED TO THE NEAREST EARTH MAT AT EVERY 30 METERS APART.
 6. EACH EQUIPMENT STRUCTURE SHALL BE CONNECTED TO THE EARTH MAT MINIMUM AT TWO POINTS
 7. DUE CARE HAS BEEN EXERCISED TO ELIMINATE FOULING OF FOUNDATIONS FOR SWITCHYARD EQUIPMENT/APPARATUS WITH THE EARTH MAT. NONETHELESS, E.EHT. MAY ENSURE TO AVOID SUCH A POSSIBILITY.
 8. 1/2" G.I PIPE LINE FOR WATER SUPPLY TO EARTH PITS SHALL BE LAID 10 CM BELOW GROUND LEVEL.
 9. G.I PIPE OF 40MM DIA. & 4MM THK. SHOULD BE USED FOR EARTH PIT.
 10. OVERHEAD EARTH WIRE SHOULD BE CONNECTED WITH EARTH MAT THROUGH RISER OF 50x6 mm MS FLATS.

R1:- LAYOUT PLAN MODI. AS PER ACTUAL DEMARICATION OF LAND RECEIVED FROM S.E. EHT UJJ. L.No.883 Dt.09-10-17, (MAIL Dt.26-10-17) Dt.30-11-17

R2:- 2No 132KV VIKRAM UDYOGPURI BAYS SHOWN AT BAY No.10 & 11 AGAINST Estt. No.---- Dt. Dt16-04-18

EARTH MAT ARRANGEMENT OF PROP. 400/220/132KV S/S		NAME	DATE
UJJAIN (Ujjain)		DRN.	G.S. DUBEY 18-07-17
SCALE 0/0 THE CHIEF ENGINEER (P&D) M.P. POWER TRANSMISSION Co. Ltd. JABALPUR		CKD.	
		APP.	
		REVISED ON	16-04-18
		DRAWING NO.	XII-N08-3012
		REV.	R2

