

NOTES:

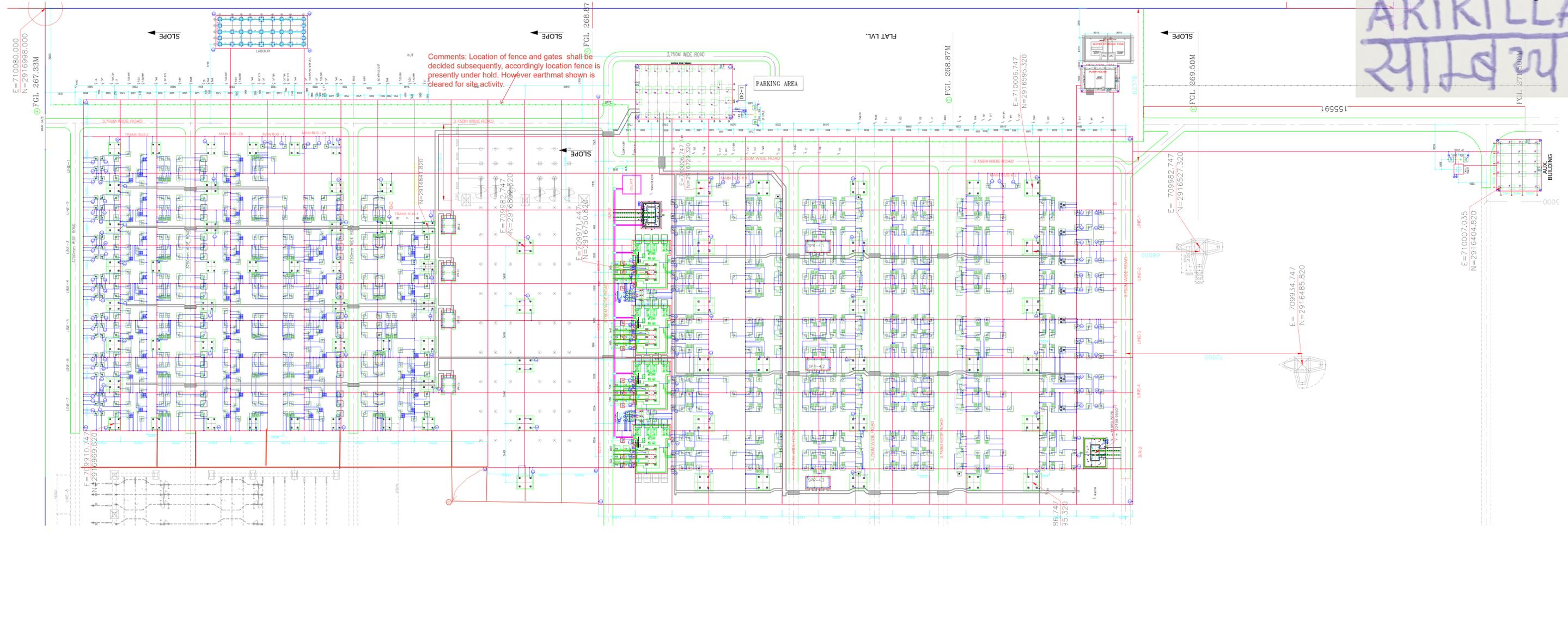
- AS PER "CEA MANUAL ON TRANSMISSION PLANNING CRITERIA 2013", BUS SECTIONALIZER IS TO BE CONSIDERED AFTER 8 NOS. OF 220KV FEEDERS. ACCORDINGLY, 2 SETS OF 220KV BUS SECTIONALIZER BAYS HAS BEEN CONSIDERED UNDER "GRANT OF 400 & 220KV BAYS TO RE GENERATORS AT FATEHGARH-III" AGAINST 1 SET MENTIONED IN MOP OM DTD-01.12.0221,
- THIS DRAWING HAS BEEN PREPARED BASED ON THE FUTURE SCOPE MENTIONED IN RFP DOCUMENT FOR ESTABLISHMENT OF 400/220KV FATEHGARH-III PS (ERSTWHILE RAMGARH-II PS), UNDER RAJASTHAN SEZ PH II PART-A SCHEME THROUGH TBCB ROUTE, TO BE READ IN CONJUNCTION WITH CTUIL EMAILS DTD-18.10.2021, 16.12.2021, 20.12.2021 & 17.01.2022 WHEREIN THE ORIGINALLY SPECIFIED FUTURE SCOPE HAVE BEEN MODIFIED TO ACCOMMODATE BESS AND STATCOM AT FATEHGARH-III PS SUBSTATION.
- ALL DIMENSIONS ARE IN mm
- DESTINATION OF FEEDERS MARKED AS FUTURE ARE INDICATIVE ONLY.
- LOCATIONS OF ROADS, RAIL CUM ROAD, RAIL TRACKS INSIDE THE SUBSTATION ARE TENTATIVE AND SHALL BE FINALIZED DURING DETAILED ENGINEERING

LEGENDS:

- TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REGENERATOR UNDER PHASE-III PART E1
 - TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REGENERATOR UNDER PHASE-III PART E2
 - GRANT OF 400KV AND 220KV BAYS TO RE GENERATORS (6x400KV LINES)
 - GRANT OF 400KV AND 220KV BAYS TO RE GENERATORS (6x220KV LINES)
 - IMPLEMENTATION OF 400KV BAYS FOR REGENERATORS AT FATEHGARH-III (ERSTWHILE RAMGARH-II PS)
 - FUTURE DESTINATION
- SCOPE OF WORKS UNDER SS-1
 SCOPE OF WORKS UNDER SS-2
 SCOPE OF WORKS UNDER SS-3

POWER GRID CORPORATION OF INDIA LIMITED				
A GOVERNMENT OF INDIA ENTERPRISE				
PROJECT:				
1. GRANT OF 400KV AND 220KV BAYS TO RE GENERATORS AT FATEHGARH - III (ERSTWHILE RAMGARH-II) PS UNDER ISTS				
2. TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ UNDER PHASE-III PART E1				
3. TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ UNDER PHASE-III PART E2				
4. IMPLEMENTATION OF 400KV BAYS FOR RE GENERATORS AT FATEHGARH-III (ERSTWHILE RAMGARH-II) PS				
SUBSTATION: 765/400/220kV FATEHGARH-3 PS SUBSTATION				
TITLE: GENERAL ARRANGEMENT DRAWING				
DATE:	DRAWN:	SCALE:	DWG.NO.:	REV:
JAN 2021	NTS		C/ENGG/SS/FATEHGARH-3/GA/01	00

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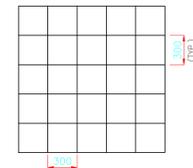
Comments: Location of fence and gates shall be decided subsequently, accordingly location fence is presently under hold. However earthmat shown is cleared for site activity.

DESIGN FEATURES OF 400/220/72.5/11kV:-

SL.No	PURPOSE	SYM	QTY
1	400kV LA EARTHING	(E)	30
2	400kV CVT EARTHING	(E)	18
3	400kV TOWER EARTHING	(E)	23
4	220kV LA EARTHING	(E)	33
5	220kV CVT EARTHING	(E)	27
6	220kV TOWER EARTHING	(E)	28
7	72.5kV VT EARTHING	(E)	06
8	11kV LA EARTHING	(E)	02
9	11kV STRUCTURE WITH PEAK	(E)	04
10	TRANSFORMER EARTHING	(PE)	08
11	BUS REACTOR EARTHING	(PE)	04
12	LT TRANSFORMER EARTHING	(PE)	08

BOQ FOR EARTHING MATERIALS:- (FOR REFERENCE ONLY)

MARK NO.	DESCRIPTION OF ITEM & ITS PURPOSE	CONDUCTOR SIZE	QTY ENGG
01	RISER CONDUCTOR AUX. MAT & RISER (BELOW GROUND)	40mm ϕ MS ROD	24500 MTR.
02	EARTHING CONDUCTOR FOR EARTHING MAIN EQUIPMENT (ABOVE GROUND)	75x12mm GS FLAT	10262 MTR.
03	EARTHING CONDUCTOR FOR LT PANELS, CONTROL PANELS, MECHANISM BOXES FENCE ETC.	50x6mm GS FLAT	2700 MTR.
04	EARTHING CONDUCTOR FOR TRENCH	50x6mm MS FLAT	2000 MTR.
05	EARTHING BRAID (LENGTH=200mm EACH)	150sq. mm CU.	770 NOS.
06	ROD EARTH ELECTRODE	40mm ϕ MS ROD	215 NOS.
07	PIPE EARTH ELECTRODE	40mm ϕ GI PIPE	20 NOS.



AUXILIARY EARTHMAT

SYMBOL	DESCRIPTION	QTY
(Red line)	40MM MS ROD FOR MAIN EARTH MAT (INCLUDING RE-ROUTING & OVERLAPPING)	10534
(Red grid)	GRID SPACING	15mtr

NOTES:-

- ALL DIMENSIONS ARE IN MM.
- EARTHING CONNECTIONS OF EQUIPMENTS SHOWN ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS OF EQUIPMENTS EARTHING CONNECTION LEADS, EARTH ELECTRODES MAY BE CHANGED TO SUIT SITE CONDITIONS.
- EARTHING LEADS FROM EQUIPMENTS/STRUCTURES SHALL BE CONNECTED TO CONDUCTORS OF MAIN EARTHING GRID.
- DEPTH OF LAYING OF MAIN EARTHING CONDUCTOR SHALL BE 600mm BELOW THE FINISHED GROUND LEVEL.
- WHEREVER EARTHING CONDUCTOR CROSSES CABLE TRENCHES, UNDERGROUND SERVICE DUCTS, PIPES, TUNNELS, RAIL TRACKS ETC., IT SHALL BE LAID MINIMUM 300mm BELOW THEM AND SHALL BE RE-ROUTED IN CASE IT FOULS WITH EQUIPMENT/STRUCTURE FOUNDATIONS.
- 50mmx6mm MS FLAT SHALL RUN ON THE TOP TIER AND ALL ALONG THE CABLE TRENCHES EARTHED AT BOTH ENDS AND AT AN INTERVAL OF 30M. THE M.S. FLAT. SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER AND TWO COATS OF ZINC ENRICHED ENAMEL PAINT.
- EARTHING CONNECTIONS WITH EQUIPMENT EARTHING PADS SHALL BE BOLTED TYPE AND BELOW GROUND LEVEL CONNECTIONS SHALL BE WELDED TYPE. FOR RUST PROTECTIONS WELDS SHOULD BE TREATED WITH RED LEAD & AFTERWARDS COATED WITH BITUMEN COMPOUND TO PREVENT CORROSION AS PER SITE INCHARGE'S DIRECTION.
- ALL BELOW GROUND LEVEL CONNECTIONS SHALL BE ELECTRIC ARC WELDING. ALL WELDED JOINTS SHALL BE ALLOWED TO COOL DOWN GRADUALLY TO ATMOSPHERIC TEMPERATURE BEFORE PUTTING ANY LOAD ON IT.
- EARTHING CONDUCTOR CROSSING THE ROAD SHALL BE LAID 300mm BELOW ROAD.
- AUXILIARY EARTH MAT SIZE 1.5m x 1.5m (220kV AND ABOVE SHALL BE LAID BELOW THE MAIN SWITCH & EARTH GROUND LEVEL SWITCH OPERATING HANDLES OF ISOLATORS AT A DEPTH OF 300mm BELOW THE FINISHED).
- ALL EQUIPMENT EARTHING SHALL BE AS PER PGCIL STANDARD EARTHING DETAIL DRAWING NO.:- C/ENG./STD./EARTHING/09
- EARTHING DETAILS:-
-MAIN EARTHING CONDUCTOR TO BE 40MM DIA MS ROD BURED IN GROUND.
-40MM DIA 3 Mtr. LONG MS ROD ELECTRODE (FOR LA, CVT, TOWER WITH PEAK)
-CONDUCTOR ABOVE GROUND & EARTHING LEADS (FOR COLUMN & AUX. STRUCTURES) : 75X12MM GS FLAT.
-EARTHING OF INDOOR LT PANELS, CONTROL PANELS & OUTDOOR MARSHALLING BOXES, MOM BOXES & LIGHTING PANELS ETC.: 50X6MM GS FLAT.
-EARTHING CONDUCTOR ALONG OUTDOOR CABLE TRENCHES: 50X6MM MS FLAT.
- ALL EARTHING SHALL BE DONE IN ACCORDANCE WITH IS:3043 UNLESS OTHERWISE MENTIONED IN THE TECHNICAL SPECIFICATION. (CLAUSE 9.0 Pg.23 TS-5E)

14. This layout shall be referred only for the laying of earth mat purpose only. Location and length of the switchyard fence will be decided later on.

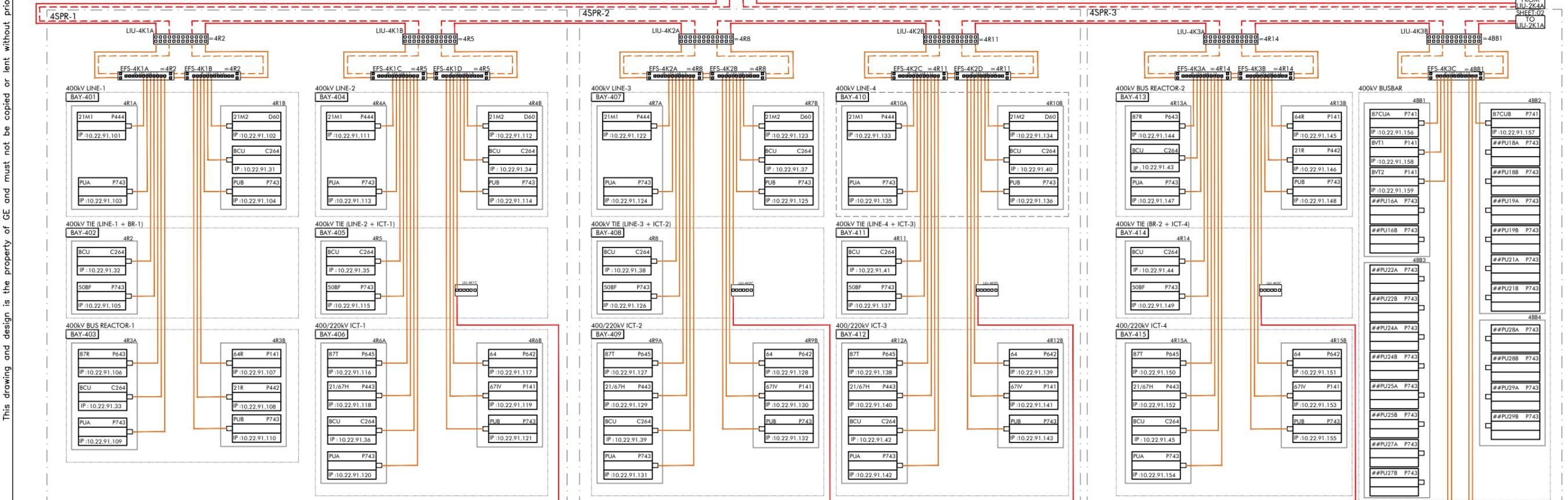
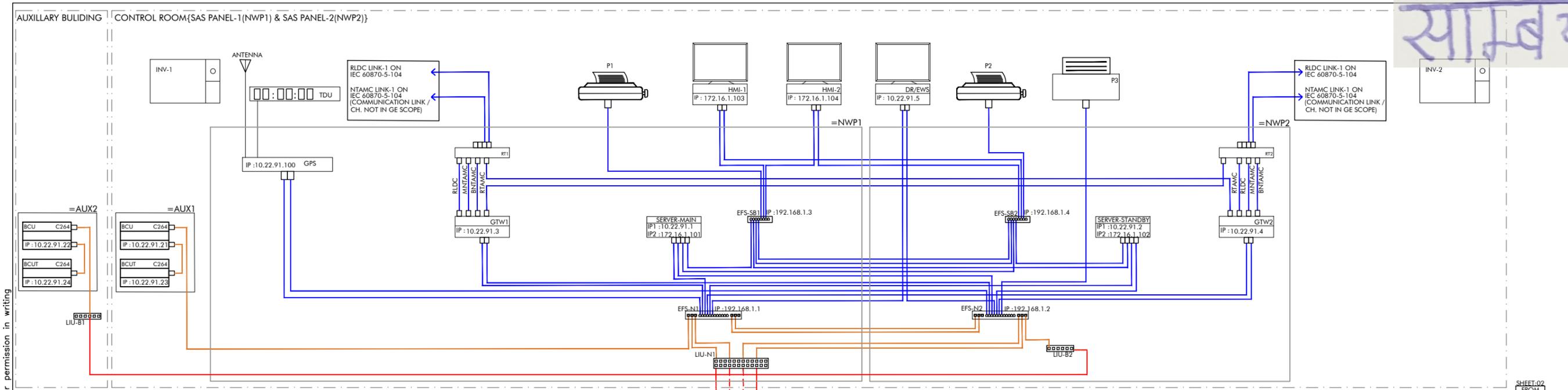
REF. DRGS:-

- FOUNDATION LAYOUT - KPTL/PGCIL/WO-SS-033/02C/RGH-II/001
- OUTDOOR CABLE TRENCH LAYOUT-KPTL/PGCIL/WO-SS-033/02E/RGH-II/002

REV.No.	DESCRIPTION	DATE	DRAWN	REVIEW	ELE.	CIVIL CHECKED	MECH.	APPROVED	STATUS
01	REVISED AS PER PGCIL COMMENTS	13.07.22	SJ	PS	SD	N/A	PM		APPROVAL
00	FIRST ISSUE	26.04.22	SJ	PS	SD	N/A	PM		APPROVAL

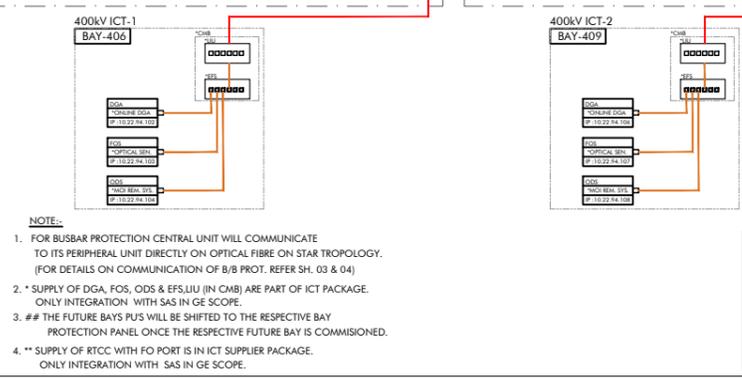
<p>OWNER: POWERGRID RAMGARH TRANSMISSION LIMITED</p> <p>CONSULTANT: Power Grid Corporation of India Ltd.</p>	2 nd FLOOR, PLOT No.-2 SECTOR-29 GURGAON-122 001 (HARYANA).
	PROJECT: SS01 for: (i) Establishment of 400/220kV Ramgarh-II PS (including 2x125MVAR, 420kV Bus Reactor); (ii) Construction of 2 nos. of 400kV line bays at Fatehgarh II PS for Ramgarh II - Fatehgarh II 400kV D/c line; and (iii) Construction of 2 nos. of 400kV line bays at Jaisalmer II (RVPN) for Ramgarh II -Jaisalmer II 400kV D/c line, associated with Transmission Scheme for evacuation of power from Solar Energy Zones in Rajasthan (8.1 GW) under phase II -Part A? through tariff based competitive bidding (TBCB) route prior to RFP bid submission by POWERGRID to BPC
NOA No.:	Ref. No.: TBCB/400kV/RAJ-Phase II-Part A/SS01/G3/NOA-1/03 Date: 15/02/2021
TITLE: EARTHING LAYOUT OF 765/400/220kV RAMGARH-II	
<p>KALPATARU POWER TRANSMISSION LIMITED B-21, SECTOR-58, NOIDA, U.P</p>	DRAWING No. KPTL/PGCIL/WO-SS-033/02E/RGH-II/009 TOTAL SH. 01 SH.No. 01 REV. 01

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PROTECTION LEGEND:-

S. No.	RELAY	DESCRIPTION
1	87CU	BUSBAR CENTRAL UNIT
2	21R	REACTOR BACKUP IMPEDANCE PROTECTION
3	64R	REACTOR REF PROTECTION
4	87R	REACTOR DIFFERENTIAL PROTECTION
5	21M1	MAIN-1 DISTANCE PROTECTION
6	21M2 / 87M2	MAIN-2 DISTANCE/DIFFERENTIAL PROTECTION
7	87T	ICT DIFFERENTIAL PROTECTION
8	64	ICT RESTRICTED EARTH FAULT PROTECTION
9	21/67H	BACKUP IMPEDANCE/HV O/C & E/F PROTECTION
10	67IV	IV O/C & E/F PROTECTION
11	50BF	TIE BREAKER FAILURE PROTECTION
12	BVT2	BUS-2 VT MONITORING
13	PU	PERIPHERAL UNIT



COMMUNICATION LEGEND:-

- 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE)-MAIN
- 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE)-REDUNDANT
- 6 CORE ARMOURED FIBRE OPTIC CABLE (MULTIMODE)-MAIN RING
- 6 CORE ARMOURED FIBRE OPTIC CABLE (MULTIMODE)-REDUNDANT RING
- RJ45 100 MBPS ETHERNET CABLE
- COAXIAL CABLE (GPS LINK)

REV.	DESCRIPTION	DATE	BY	CHECKED	DATE	BY	APPROVED	DATE	BY	STATUS
C	THIRD SUBMISSION	11.04.22			11.04.22			11.04.22		
B	SECOND SUBMISSION	08.04.22			08.04.22			08.04.22		
A	FIRST ISSUE	03.03.22			03.03.22			03.03.22		

CUSTOMER : POWERGRID CORP. OF INDIA LIMITED
PO NO. : LOA/PGCIL/RAMGARH PACKAGE/CRP-SAS/G
PO DATE : 31.08.2021
PROJECT : ESTABLISHMENT OF 400/220kV SS AT RAMGARH II

GE T&D India Ltd.
 Grid Automation-Pallavaram India

TITLE : 400kV SYSTEM ARCHITECTURE
DRAWING NO.: K23DS5A1
DATE : 01.04.2022

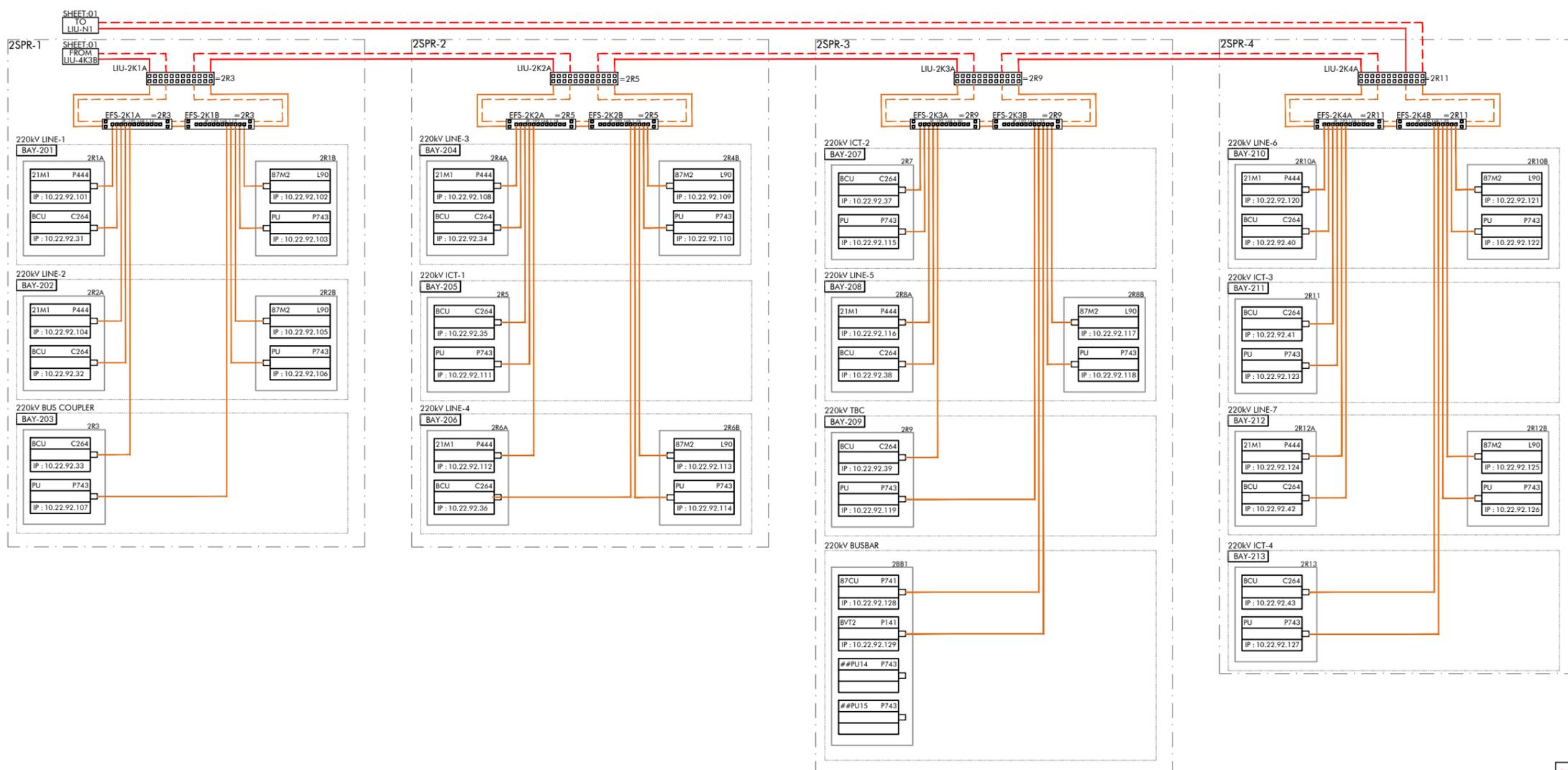
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FILE NAME: KZ3D-SA.dwg

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FILE NAME: KZ30-SA.dwg



EFS PORT TABLE:-

S. No.	ETHERNET SWITCH	USED PORTS	SPARE PORTS	TOTAL PORTS
1	EFS-4K1A	11FX	5FX	16FX
2	EFS-4K1B	10FX	6FX	16FX
3	EFS-4K1C	12FX	4FX	16FX
4	EFS-4K1D	11FX	5FX	16FX
5	EFS-4K2A	12FX	4FX	16FX
6	EFS-4K2B	11FX	5FX	16FX
7	EFS-4K2C	12FX	4FX	16FX
8	EFS-4K2D	11FX	5FX	16FX
9	EFS-4K3A	13FX	3FX	16FX
10	EFS-4K3B	11FX	5FX	16FX
11	EFS-4K3C	12FX	4FX	16FX
12	EFS-2K1A	9FX	7FX	16FX
13	EFS-2K1B	9FX	7FX	16FX
14	EFS-2K2A	9FX	7FX	16FX
15	EFS-2K2B	9FX	7FX	16FX
16	EFS-2K3A	9FX	7FX	16FX
17	EFS-2K3B	9FX	7FX	16FX
18	EFS-2K4A	10FX	6FX	16FX
19	EFS-2K4B	10FX	6FX	16FX
20	EFS-N1	6TX+5FX	6TX+1FX	12TX+6FX
21	EFS-N2	7TX+5FX	5TX+1FX	12TX+6FX
22	EFS-SB1	7TX	1TX	8TX
23	EFS-SB2	7TX	1TX	8TX

LEGEND:-

- 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE) [MAIN]
- 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE) [REDUNDANT]
- 6 CORE ARMoured FIBRE OPTIC CABLE (MULTIMODE) [MAIN RING]
- 6 CORE ARMoured FIBRE OPTIC CABLE (MULTIMODE) [REDUNDANT RING]

CUSTOMER : POWERGRID CORP. OF INDIA LIMITED

PO NO. : LOA/PGCIL/RAMGARH PACKAGE/CRP-SAS/G

PO DATE : 31.08.2021

PROJECT : ESTABLISHMENT OF 400/220KV SS AT RAMGARH II

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
C	THIRD SUBMISSION							
B	SECOND SUBMISSION							
A	FIRST ISSUE							

GE T&D India Ltd.
Grid Automation-Pallavaram India

TITLE : 220kV SYSTEM ARCHITECTURE

DRAWING NO.: KZ3D5A1

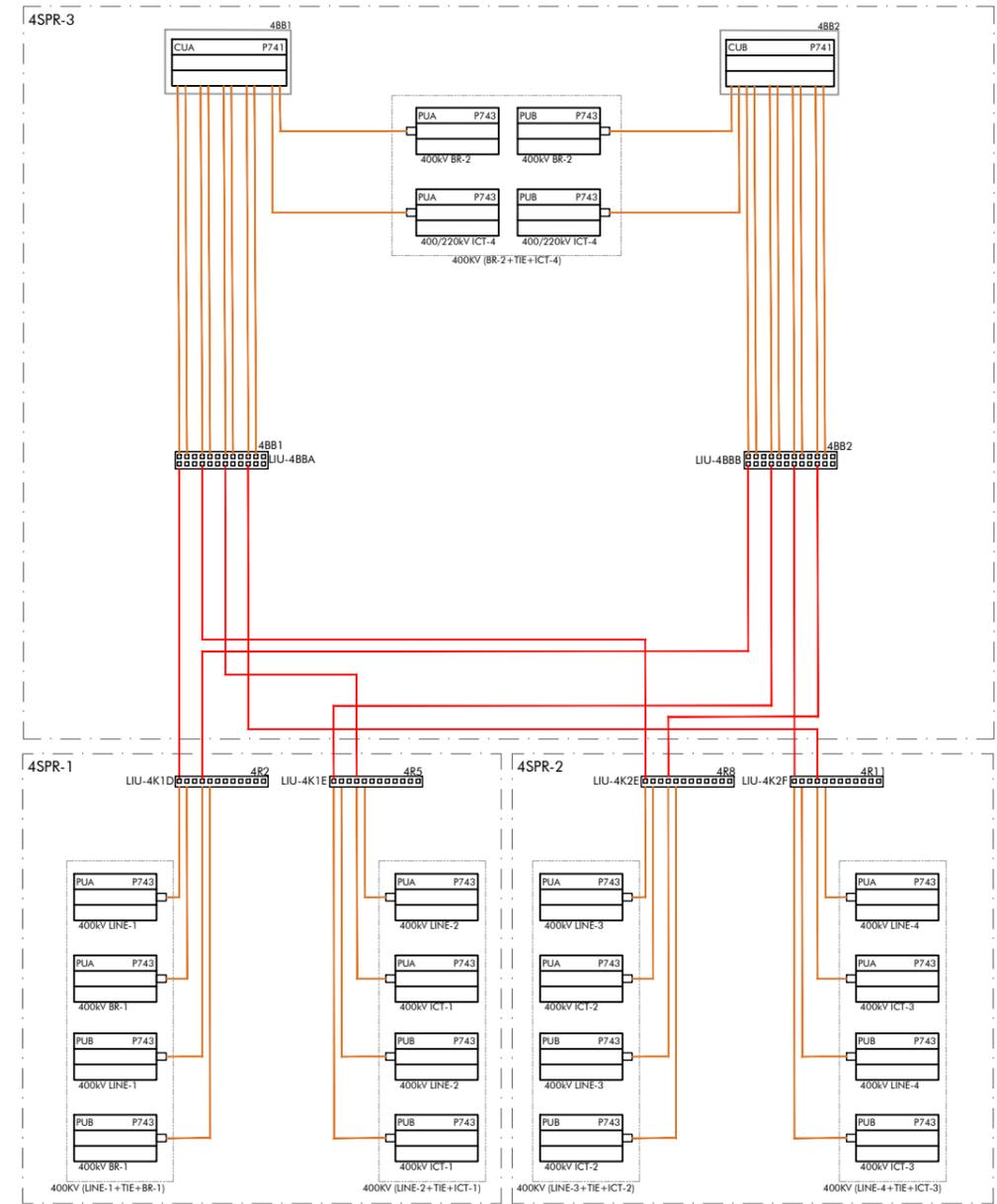
DATE : 01.04.2022

SCALE : 1:1

REV. NO. : 01

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LEGEND:-
— 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE)
— 6 CORE ARMoured FIBRE OPTIC CABLE (MULTIMODE)

CUSTOMER :	POWERGRID CORP. OF INDIA LIMITED
PO NO. :	LOA/PGCIL/RAMGARH PACKAGE/CRP-SAS/G
PO DATE :	31.08.2021
PROJECT :	ESTABLISHMENT OF 400/220KV SS AT RAMGARH II

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
C	THIRD SUBMISSION	Norml	SS	Norml	SS	Norml	SS	
B	SECOND SUBMISSION	Norml	SS	Norml	SS	Norml	SS	
A	FIRST ISSUE	Norml	SS	Norml	SS	Norml	SS	FA

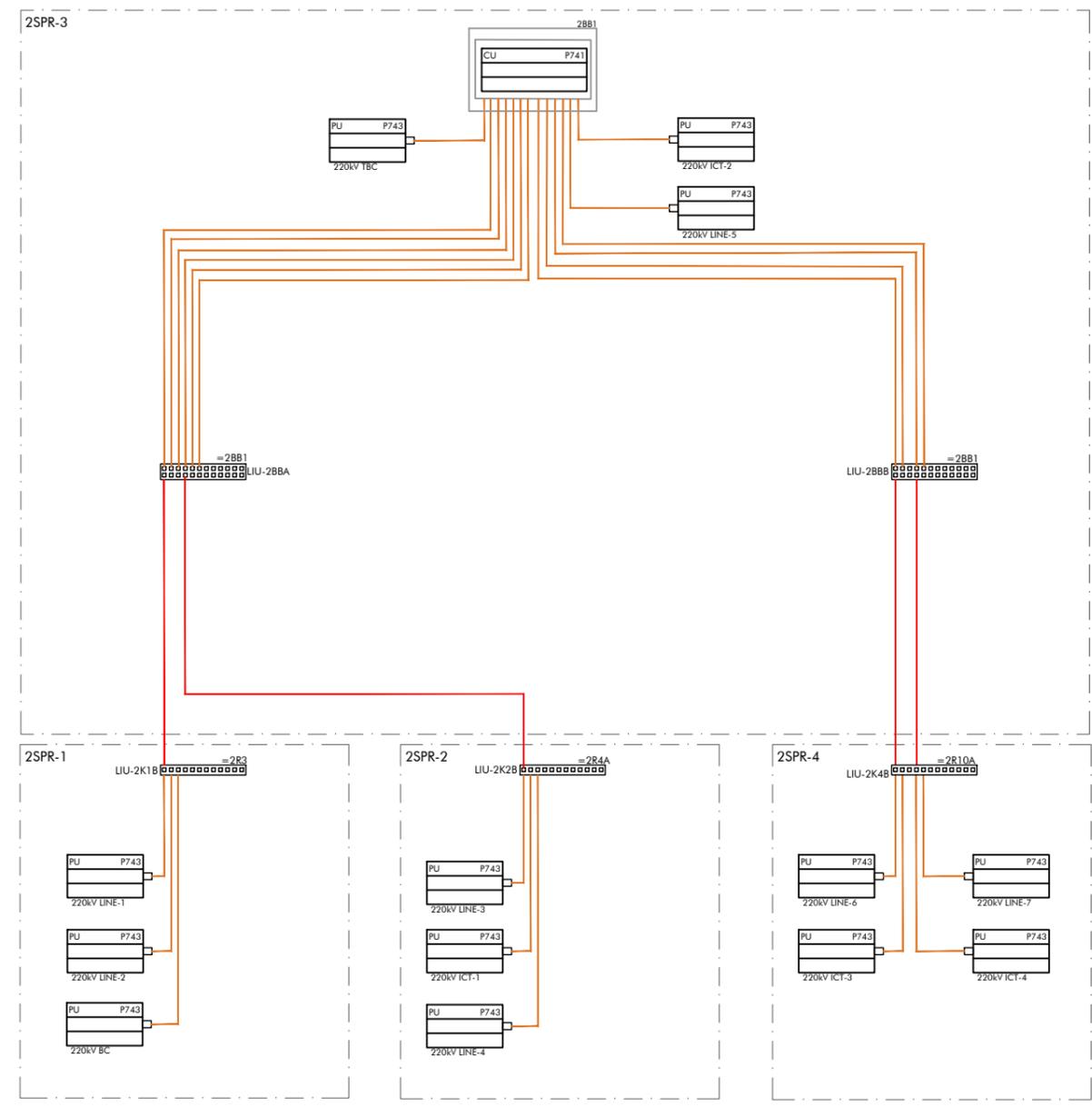
GE T&D India Ltd.
 Grid Automation-Pallavaram India

TITLE : 400KV BUSBAR ARCHITECTURE
DRAWING NO.: KZ3DSA1
DATE : 01.04.2022

TOTAL SHEETS	10
SHEET NO.	04
SCALE	NA
REV.	C

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LEGEND:-
— 100MBPS FIBRE OPTIC PATCH CORD (MULTIMODE)
— 6 CORE ARMoured FIBRE OPTIC CABLE (MULTIMODE)

CUSTOMER :	POWERGRID CORP. OF INDIA LIMITED
PO NO. :	LOA/PGCIL/RAMGARH PACKAGE/CRP-SAS/G
PO DATE :	31.08.2021
PROJECT :	ESTABLISHMENT OF 400/220KV SS AT RAMGARH II

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
C	THIRD SUBMISSION	Norml	SS	Norml	SS	Norml	SS	
B	SECOND SUBMISSION	Date 01.04.22		Date 01.04.22		Date 01.04.22		
A	FIRST ISSUE	Date 03.02.22		Date 03.02.22		Date 03.02.22		FA
		Date 13.12.2021		Date 13.12.2021		Date 13.12.2021		

GE T&D India Ltd.
 Grid Automation-Pallavaram India

TITLE : 220KV BUSBAR ARCHITECTURE

DRAWING NO.: KZ3DSA1 **DATE :** 01.04.2022

TOTAL SHEETS	04
SHEET NO.	04
SCALE	NA
DATE	01.04.2022