

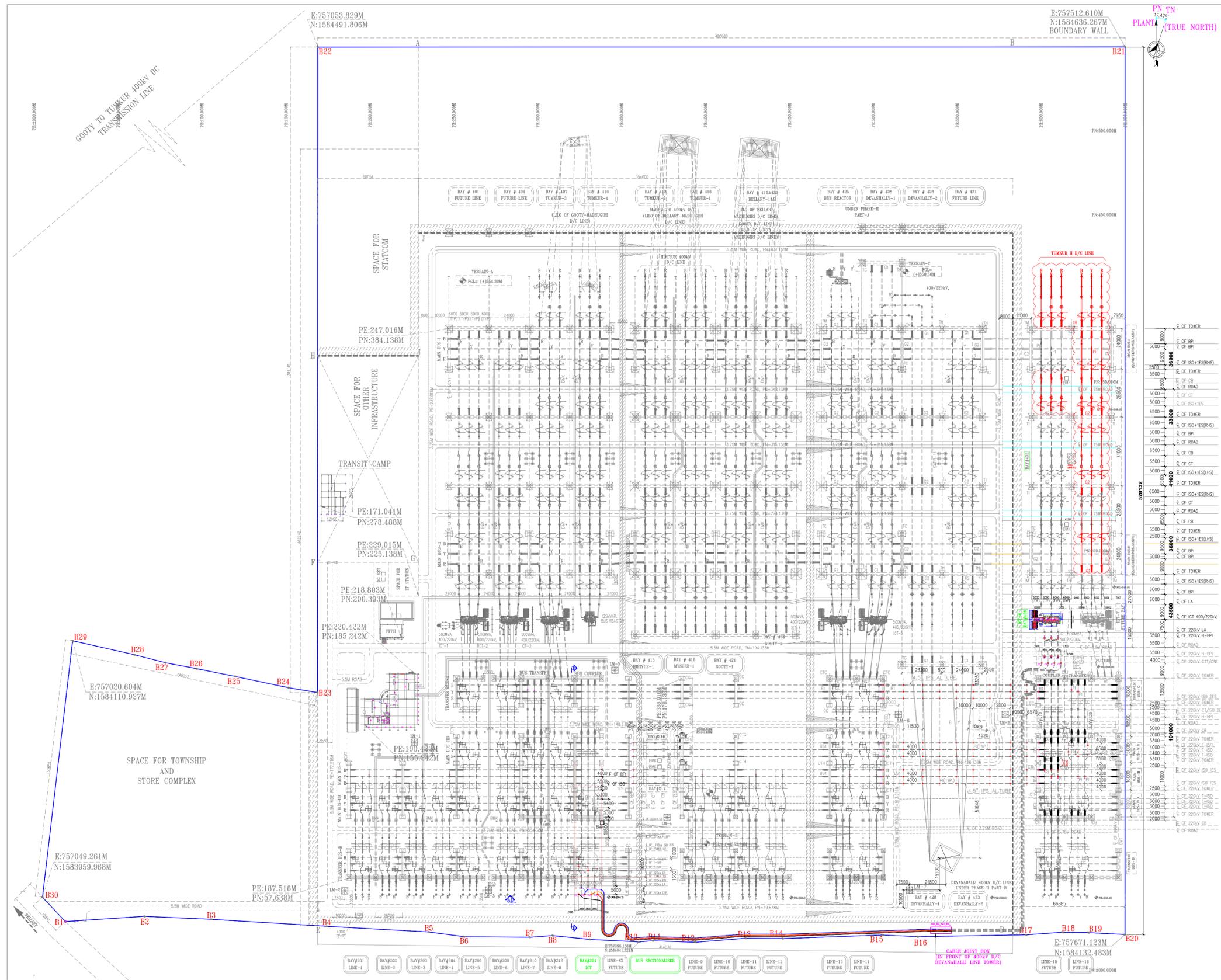
400KV BILL OF QUANTITY :-

SL NO.	SYMBOL	DESCRIPTION
1.0		420KV, 3150A CIRCUIT BREAKER (3-PH)
2.0		420KV, 3150A ISOLATOR (3-PH) (DOUBLE BREAK) WITH ONE E/S
3.0		400KV CVT (1-PHASE)
4.0		420 KV, 3000A, 1-PHASE CURRENT TRANSFORMER WITH 120% EXTENDED CURRENT RATING
5.0		336KV SURGE ARRESTER (1-PHASE)

LEGEND:-



CONSULTANT:			
<b>POWER GRID CORPORATION OF INDIA LIMITED</b> <small>(A GOVERNMENT OF INDIA ENTERPRISE)</small>			
PROJECT:			
BAY ALLOCATION_400KV LINE BAYS FOR PAVAGADA-TUMKUR-II D/C LINE			
SUBSTATION:			
400/220kV PAVAGADA (TUMKUR) EXTN SUBSTATION			
TITLE:			
SINGLE LINE DIAGRAM			
DATE	SCALE	DRG.NO.	REV
OCT, 2023	NTS	C/ENGG/400/220kV/PAVAGADA/SLD/01	0



**NOTES:-**  
 1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.

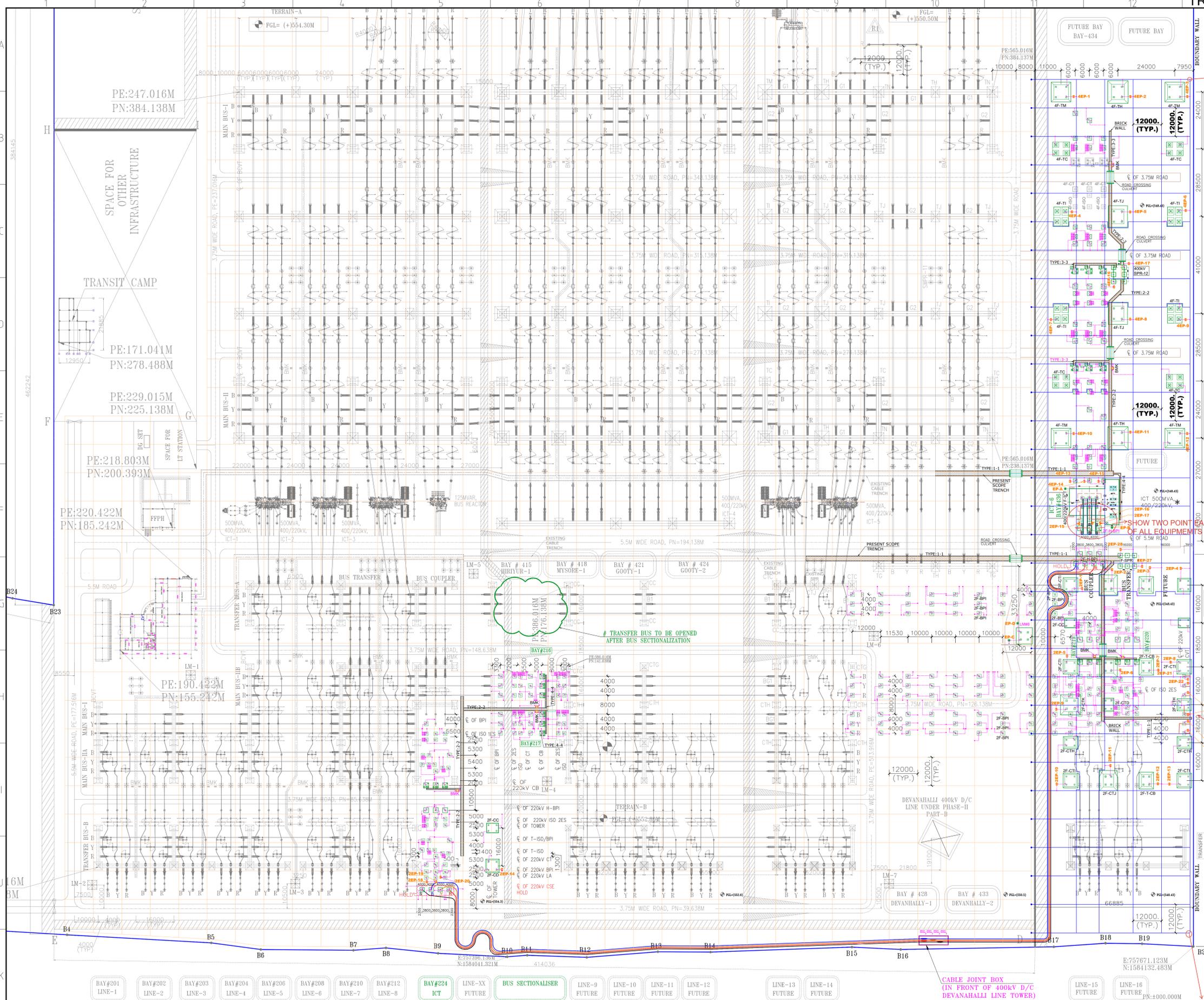
CONSULTANT:  
**POWER GRID CORPORATION OF INDIA LIMITED**  
 (A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT:  
 BAY ALLOCATION\_400KV LINE BAYS FOR 400KV PAVAGADA-TUMKUR-II D/C LINE

SUBSTATION:  
 400/220kV PAVAGADA (TUMKUR) EXTN SUBSTATION

TITLE:  
 ELECTRICAL LAYOUT PLAN

DATE	SCALE	DRG.NO.	REV
OCT 2023	NTS	C/ENGG/400/220kV/PAVAGADA/GA/01	0



- GENERAL NOTES:-**
- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
  - ALL EQUIPMENTS AND STRUCTURES SHALL BE GENERAL OR GROUNDED AT TWO POINTS AT OPPOSITE CORNERS WHETHER SHOWN OR NOT AND THESE SHALL BE CONNECTED TO DIFFERENT PARTS OF THE GRID MAT WHEREVER APPLICABLE.
  - GROUNDING CONDUCTORS IN OUTDOOR AREAS SHALL BE BURIED 600MM BELOW FINISHED GROUND LEVEL.
  - WHENEVER A GROUNDING CONDUCTOR CROSSES ROAD, CABLE TRENCHES, SERVICE DUCTS, PIPES, TUNNELS, RAILWAY TRACKS, RECOVERY TANKS, TRANSFORMER SOAK PIT ETC. IT SHALL BE LAID AT LEAST 300MM BELOW THEM, SHALL BE REROUTED ROUND THE EQUIPMENT/STRUCTURE FOUNDATIONS.
  - GROUNDING CONDUCTORS EMBEDDED IN CONCRETE SHALL HAVE APPROXIMATELY 50MM CONCRETE COVER. IF GROUNDING CONDUCTOR IS REQUIRED TO BE EMBEDDED IN MAJOR FOUNDATIONS, THEN IT SHALL BE LAID IN SLEEVE.
  - CONNECTION BETWEEN EQUIPMENT LEADS AND MAIN GROUND CONDUCTORS SHALL BE WELDED TYPE WITH TWO COATS PROTECTION, THE WELDS SHALL BE CLEANED WITH WIRE BRUSH, TREATED WITH RED LEAD PRIMER AND AFTERWARDS THICKLY COATED WITH TWO COATS BITUMEN COMPOUND TO PREVENT CORROSION.
  - ALL GROUND CONNECTIONS SHALL BE MADE BY ELECTRIC ARC WELDING ALL WELDED JOINTS SHALL BE ALLOWED TO COOL DOWN GRADUALLY TO ATMOSPHERIC TEMPERATURE BEFORE PUTTING ANY LOAD ON THEM. ARTIFICIAL COOLING SHALL NOT BE ALLOWED.
  - SENDING OF LARGE DIAMETER ROD/THICK CONDUCTOR SHALL BE DONE PREFERABLY BY GAS HEATING OR ANY OTHER APPROVED METHOD.
  - ALL ARC WELDING OF LARGE DIAMETER CONDUCTORS SHALL BE DONE BY LOW HYDROGEN CONTENT ELECTRODES.
  - LOCATION OF ROD ELECTRODE & PIPE ELECTRODE ARE SHOWN TENTATIVELY, ELECTRODES FOR CVT'S, LA'S, TRANSFORMER & LM'S SHALL BE LOCATED NEAREST TO RESPECTIVE EQUIPMENT (AS PRACTICABLE).
  - ALL ELECTRODES SHALL BE 40 DIA. X 3000 MM LONG M.S. ROD EXCEPT FOR TRANSFORMER NEUTRAL WHERE IT IS 40 DIA X 3000 MM PIPE ELECTRODE.
  - GROUNDING CONDUCTORS ALONG THEIR RUN ON CABLE TRENCH, LADDER, COLUMN, BEAMS, WALLS, ETC. SHALL BE SUPPORTED BY SUITABLE WELDING / CLIPPING AT INTERVALS OF 1000 MM. GROUNDING CONDUCTORS ALONG CABLE TRENCHES SHALL BE ON THE WALL NEAR TO THE EQUIPMENT WHEREVER GALVANIZED IRON ENDS OF THE SLEEVES SHALL BE PROVIDED FOR THE PASSAGE OF THE CONDUCTOR. BOTH ENDS OF THE SLEEVES SHALL BE SEALED TO PREVENT THE PASSAGE OF WATER THROUGH THE SLEEVES.
  - ALL STEEL COLUMNS, METALLIC STAIRS ETC. SHALL BE CONNECTED TO THE NEAREST GROUNDING CONDUCTOR BY GROUNDING LEADS. ELECTRICAL CONTINUITY SHALL BE ENSURED BY BONDING THE DIFFERENT SECTION OF HAND RAILS AND METALLIC STAIRS.
  - METALLIC PIPES, CONDUITS AND CABLE TRAY SECTION FOR CABLE INSTALLATION SHALL BE BONDED TO ENSURE ELECTRICAL CONTINUITY AND CONNECTED TO THE GROUNDING CONDUCTOR AT NOT MORE THAN 10 METRS INTERVALS APART FROM INTERMEDIATE CONNECTION. BOTH ENDS SHALL ALSO BE CONNECTED TO THE GROUNDING SYSTEM.
  - A SEPARATE GROUNDING CONDUCTOR SHALL BE PROVIDED FOR GROUNDING LIGHTING FIXTURES, RECEPTACLES, SWITCHES, JUNCTION BOXES, LIGHTING CONDUITS ETC.
  - WHEREVER GROUNDING CONDUCTORS CROSSES OR RUNS ALONG METALLIC STRUCTURES SUCH AS GAS / WATER STEAM CONDUIT / PIPES, AND STEEL OF HAND RAILS AND METALLIC STAIRS, ALL TRENCHES SHALL BE EARTHED AT INTERVALS OF 30 METRS. ALONG THE LENGTH OF THE TRENCH & AT ALL ENDS OF THE TRENCHES, RISER SHALL BE PROVIDED FOR TRENCH EARTHING AT EVERY 30 METRS & AT ALL ENDS (WHERE REQUIRED).
  - FOR EQUIPMENT, FENCE, GATE, ETC. EARTHING DETAILS REFER POOL STANDARD EARTHING DETAILS PROVIDED IN TECHNICAL SPECIFICATION, SECTION- SWITCHYARD ERECTION REVISION - 10.
  - EVERY ALTERNATE POINT OF FENCE SHALL BE CONNECTED TO EARTH MESH.
  - THE RISER CONNECTION TO EARTH MAT WILL BE 40 MM DIA ROD. THE RISER TO EQUIPMENT CONNECTION WILL BE BY 75 X 12 MM G.I. FLAT.
  - AUXILIARY EARTHING MESH OF CLOSELY SPACED (300 MM X 300 MM) OF SIZE 1500 MM X 1500 MM CONDUCTOR SHALL BE PROVIDED BELOW THE OPERATING HANDLES OF 500V AND ABOVE.
  - ALL EARTHING WILL BE DONE IN ACCORDANCE WITH IS-3043 UNLESS OTHERWISE SPECIFIED IN THE TECHNICAL SPECIFICATION.

**BILL OF MATERIALS :-**

SR NO.	SYMBOL	DESCRIPTION	UNIT	ENG. QTY.
01		40MM DIA MS ROD (EXISTING MAIN GRID)	MTRS.	-
02		40MM DIA MS ROD (PROPOSED MAIN GRID)	MTRS.	6000
03		40MM DIA MS ROD (FOR RISER)	MTRS.	7100
04		75X12MM GS FLAT (ALONG EQUIPMENT SUPPORT STR.)	MTRS.	3750
05		50X6MM MS FLAT (CABLE TRENCH)	MTRS.	1850
06		50X6MM GS FLAT (J/B & BMK)	MTRS.	250
07		AUX. EARTH MAT (1500MMX1500MM)	NOS.	1380
08		40MM DIA. 3.0MTR. LONG MS ROD ELECTRODE(NON-TREATED)	NOS.	45
09		40MM DIA. 3.0MTR. LONG GS PIPE ELECTRODE(TREATED)	NOS.	04

Rod electrode with test link shall be provided for LM. Pls revise in drawing & BOQ.

RISERS FOR TOWER WITH PEAK LM, LA & CVT SHALL BE SHOWN IN LINE WITH TS REQUIREMENT

**220KV BILL OF MATERIALS :-**

SYMBOL	DESCRIPTION	EQUIPMENT	EARTH PIT NO.	UNIT	QTY.
		GANTRY TOWER	2EP-01 TO 2EP-14	NOS.	14
		200KV SURGE ARRESTER	2EP-15 TO 2EP-20	NOS.	06
		CVT	2EP-21 TO 4EP-26	NOS.	06
		SPR ROOM BUILDING	2EP-27 TO 4EP-28	NOS.	02
		TOTAL		NOS.	28

**400KV BILL OF MATERIALS :-**

SYMBOL	DESCRIPTION	EQUIPMENT	EARTH PIT NO.	UNIT	QTY.
		GANTRY TOWER	4EP-01 TO 4EP-12	NOS.	12
		400KV SURGE ARRESTER	4EP-13 TO 4EP-15	NOS.	03
		SPR ROOM BUILDING	4EP-16 TO 4EP-17	NOS.	02
		TOTAL		NOS.	17
		POWER TRANSFORMER / ICT	EP-A TO EP-B	NOS.	02
		LM	EP-C TO EP-D	NOS.	02

NAME	SIGN	DATE
DRAWN	B.A.R.	22.05.23
CHECKED	A.V.P	22.05.23
APPROVED	K.K.L	22.05.23

DRG. NO. : V-60/PAVAGADA-C/DG  
/EARTH MAT-LAYOUT/006  
SCALE: NTS  
SHEET NO. : 1 OF 1

CLIENT : **POWER GRID CORPORATION OF INDIA LIMITED.**

PROJECT : SUBSTATION PACKAGE SS-99 FOR AUGMENTATION OF TRANSFORMATION CAPACITY BY 1x500MVA, 400/220KV ICT (6TH AT PAVAGADA PS) UNDER AUGMENTATION OF TRANSFORMATION CAPACITY BY 1x500MVA, 400/220KV ICT (6TH) AND COMMON FACILITY AT PAVAGADA (TUMKUR) PS

NOA NO. : 5002002364/SUB-STATION (INCLUDING/DOM/A00-CC CS-1/NOA-I/SR2-500011, Dated-16.12.22, 5002002364/SUB-STATION (INCLUDING/DOM/A00-CC CS-1/NOA-II/SR2-500012, Dated-16.12.22.

REV. NO.	DATE	DESCRIPTION	CHECKED	APPROVED
R1	17.06.23	REVISED AS PER PGCL COMMENTS	A.V.P.	K.K.L.
RO	22.05.23	ISSUED FOR APPROVAL	A.V.P.	K.K.L.

REVISION HISTORY