DRAWING NO. TB 0 369 316 008

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

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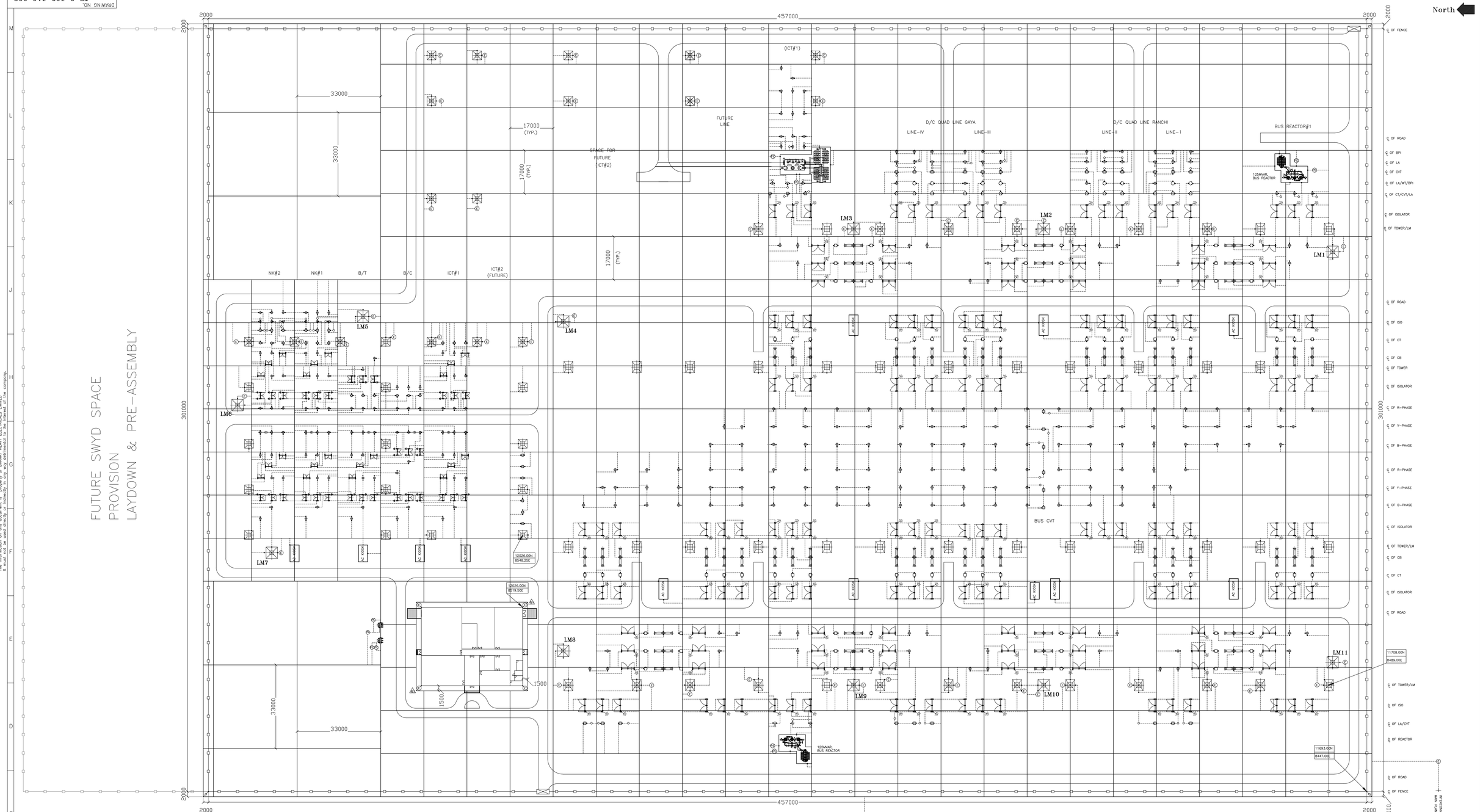
FUTURE SWYD SPACE PROVISION LAYDOWN & PRE-ASSEMBLY



EARTHING NOTES :-

1) ALL EQUIPMENTS AND STRUCTURES SHALL, IN GENERAL, BE GROUNDED AT TWO POINTS AT OPPOSITE CORNERS WHETHER SHOWN IN DRAWING OR NOT AND THESE SHALL BE CONNECTED TO DIFFERENT PARTS OF THE MATS WHEREVER POSSIBLE IN ADDITION ALL EARTHING AS PER TYPICAL EARTHING DETAIL IN DRG. NO. 4410-001-572-PVE-F-0038 TO BE FOLLOWED.
2) GROUNDING CONDUCTORS IN OUTDOOR AREAS SHALL BE BURIED 600MM BELOW FINISHED GROUND LEVEL.
3) WHENEVER A GROUNDING CONDUCTOR CROSSES ROADS, CABLE TRENCHES, UNDERGROUND SERVICE DUCTS, PIPE TUNNELS, RAILWAY TRACKS, OIL RECOVERY TANK, TRANSFORMER SOAK PIT ETC. SHALL BE LAID AT LEAST 500MM BELOW THEM, BUT NOT LESS THAN 600MM BELOW FGL AND SHALL BE REROUTED ROUND THE EQUIPMENT/STRUCTURE FOUNDATIONS.
4) GROUNDING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED IN GROUND AT A MINIMUM DISTANCE OF 1500mm FROM THE OUTER BOUNDARY OF THE BUILDING.
5) GROUNDING CONDUCTORS EMBEDDED IN CONCRETE SHALL HAVE APPROXIMATELY 50mm CONCRETE BELOW COVER. IF GROUNDING CONDUCTOR IS REQUIRED TO BE EMBEDDED IN MAJOR FOUNDATIONS, THEN IT SHALL BE LAID IN A SLEEVE.
6) CONNECTION WITH EQUIPMENT EARTHING PAD SHALL BE BOLTED TYPE CONNECTION BETWEEN EQUIPMENT GROUNDING LEADS AND MAIN GROUND CONDUCTORS SHALL BE WELDED TYPE. FOR RUST PROTECTION THE WELDS SHALL BE CLEANED WITH WIRE BRUSH, TREATED WITH RED PRIMER AND AFTERWARDS THICKLY COATED WITH BITUMEN
7) 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.
8) BENDING OF LARGE DIAMETER ROD/THICK CONDUCTOR SHALL BE DONE BY GAS HEATING.
9) ALL ARC WELDING OF LARGE DIAMETER CONDUCTORS SHALL BE DONE BY NORMAL LOW HYDROGEN CONTENT ELECTRODES.
10) LOCATION OF PIPE ELETRODES PE & ROD ELECTRODES WITH/WITHOUT TEST PIT ARE SHOWN TENTATIVELY.
11) ALL ELECTRODES SHALL BE 40ø x 3000mm LONG M.S. ROD EXCEPT FOR TRANSFORMER NEUTRAL/REACTOR WHERE IT IS 40ø x 3000mm PIPE ELECTRODE MINIMUM 6000mm SPACING BETWEEN PIPE ELECTRODES SHALL BE PROVIDED.
12) EARTHING TERMINAL OF EACH SURGE ARRESTER, CVT AND LIGHTNING DOWN CONDUCTOR SHALL BE DIRECTLY CONNECTED TO ROD ELECTRODE WHICH IN TURN SHALL BE CONNECTED TO MAIN EARTHING GRID.
13) GROUNDING CONDUCTORS ALONG THEIR RUN ON CABLE TRENCH, LADDER, COLUMNS, BEAMS, WALLS, ETC. SHALL BE SUPPORTED BY SUITABLE WELDING/CLEATING AT AN INTERVALS OF 750mm. GROUNDING CONDUCTOR ALONG CABLE TRENCHES SHALL BE ON THE WALL NEAR TO THE EQUIPMENT. WHEREVER A GROUNDING CONDUCTOR PASSES THROUGH WALL, FLOORS ETC GALVANIZED IRON SLEEVE SHALL BE PROVIDED FOR THE PASSAGE OF THE CONDUCTOR. BOTH END OF THE SLEEVE SHALL BE SEALED TO PREVENT THE PASSAGE OF WATER THROUGH THE SLEEVE.
14) 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 SECTIONS OF HAND RAILS AND METALLIC STAIRS.
15) METALLIC PIPES, CONDUITS AND CABLE TRAY SECTION FOR CABLE INSTALLATION SHALL BE BONDED TO ENSURE ELECTRICAL CONNECTION TO GROUNDING CONDUCTOR AT NOT MORE THAN 10m INTERVAL APART FROM INTERMEDIATE CONNECTION, BOTH ENDS SHALL ALSO BE CONNECTED TO THE GROUNDING SYSTEM.
16) WHEREVER GROUNDING CONDUCTOR CROSSES OR RUNS ALONG METALLIC STRUCTURES SUCH AS GAS/WATER/STEAM CONDUIT/PIPES ETC. AND STEEL REINFORCEMENT OF CONCRETE, IT SHALL BE BONDED TO THE SAME.
17) LIGHTING POLES, JUNCTION BOXES ON THE POLES, CABLE BOXES/GLANDS, SWITCHES ETC. SHALL BE CONNECTED TO CONDUCTOR RUNNING ALONGWITH THE SUPPLY CABLE WHICH IN TURN SHALL BE CONNECTED TO THE GROUNDING GRID CONDUCTOR AT LEAST TWO POINTS WHETHER SPECIFICALLY SHOWN OR NOT.
18) 75X12 mm STEEL FLAT SHALL BE USED FOR EARTHING OF CABLE TRENCHES . ALL TRENCHES SHALL BE EARTHED AT AND INTERVAL OF 20m ALONG THE LENGTH OF THE TRENCH & AT ALL BENDS OF THE TRENCHES, RISERS SHALL BE PROVIDED FOR TRENCH EARTHING AT EVERY 20m & AT ALL BENDS.
19) FOR EQUIPMENT, FENCE, GATE, AUXILIARY EARTH MAT ETC. EARTHING DETAILS REFER DRG. 4410-001-572-PVE-F-0038.
20) EVERY POST OF FENCE AND GATE SHALL BE CONNECTED TO EARTH MESH BY ONE LEAD.
21) THE RISER CONNECTION TO EARTHMAT WILL BE 40mm DIA ROD. THE RISER TO EQUIPMENT/ STRUCTURE CONNECTION WILL BE BY 75x12mm G.I. FLAT
22) IN CASE HIGH TEMPERATURE IS ENCOUNTERED AT SOME LOCATION THE EARTHING CONDUCTOR SHALL BE LAID MINIMUM 1500mm AWAY FROM SUCH LOCATIONS.
23) RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE BONDED ACROSS FISH PLATES AND CONDUCTOR TO EARTHING GRID AT SEVERAL LOCATION.
24) AUXILIARY EARTHING MESH OF CLOSELY SPACED (300mm x 300mm) OF SIZE 1500mm x 1500mm CONDUCTOR SHALL BE PROVIDED BELOW THE OPERATING HANDLES OF ISOLATORS .
25) EARTHMAT SHOULD BE LAID 2m BEYOND FENCE ON ALL SIDES.
26) RISERS FOR MK, JB, CB MBs ARE NOT SHOWN FOR SAKE OF CLARITY. FOR TYPICAL DETAILS PLEASE REFER EQUIPMENT EARTHING DRAWING.
27) FOR EQUIPMENTS IN TRANSFORMER YARD, INTERMEDIATE TOWERS IN FRONT OF A-ROW, EARTHING WILL BE DONE BY CONNECTING TO THE NEAREST EARTHMAT AVAILABLE.
28) TYPICAL EARTHMAT GRID SPACING IN SWITCHYARD AREA IS CONSIDERED AS 17m, HOWEVER FOR UNEQUIPPED AREAS IN 220kV YARD SIDE, SPACING OF 33m IS TO BE PROVIDED WHICH AS PER THE EARTHMAT DESIGN IS MEETING THE STEP & TOUCH POTENTIAL REQUIREMENT.
29) EARTHING LAYOUT SHOWN IN DRAWING IS DIAGRAMATIC ONLY. THE CONDUCTOR SPACING CAN BE CHANGED SLIGHTLY TO SUIT SITE CONDITIONS.

QUANTITIES OF MATERIALS

40 MM DIA MS ROD (INCLUDING ROD ELECTRODES)	450 MT (45000m)
75X12 MM GI FLAT	84 MT (11800m)
50X6 MM GI FLAT	11 MT(4400m)
ROD ELECTRODE WITH TEST LINK (FOR LM, TOWERS WITH PEAK, CR BUILDING & CONNECTION TO MAIN PLANT GRID)	57 NOS.#
ROD ELECTRODE WITHOUT TEST LINK (FOR CVT, LA & FENCE CORNERS)	94 NOS.*
PIPE ELECTRODE (FOR ICT, REACTOR & LT TRANSFORMERS)	10 NOS.

'*' - QTY INCLUDES 18 NOS. ELECTRODES PROVIDED FOR LA IN TRANSFORMER YARD.
'#' - QTY INCLUDES 04 NOS. ELECTRODES PROVIDED FOR TOWERS WITH PEAK IN TRANSFORMER YARD.

QUANTITIES OF RISERS

S.NO.	EQUIPMENT	NO. OF RISERS PER EQPT
01	400, 220kV CB, 3-PH	20
02	400, 220kV ISO (1ES), 3-PH	16
03	400kV ISO (2ES), 3-PH	18
04	400, 220kV CT	02
05	400, 220kV LINE CVT	03
06	400, 220kV CVT (EXCEPT LINE CVT)	02
07	336, 216kV SA	03
08	MK, JB, AC KIOSK, CRP	02
09	400, 220kV PI	02
10	220kV ISO (TANDEM, WO ES), 3-PH	14
11	TOWER WITHOUT PEAK	02
12	TOWER WITH PEAK, LM	03
13	400kV ICT	08
14	400kV REACTOR	08
15	LT TRANSFORMER	08
16	WAVE TRAP	06
17	CONTROL ROOM BUILDING	04

THIS DRAWING SHOULD BE READ ALONG WITH EQUIPMENT EARTHING DRAWING

LEGENDS

- MAIN EARTHMAT CONDUCTOR 40mm DIA MS ROD
- RISER FOR EQUIPMENT/ STRUCTURE EARTHING
- PIPE ELECTRODE WITH TREATED PIT
- ROD ELECTRODE WITH TEST PIT
- ROD ELECTRODE WITHOUT TEST PIT

REFERENCE DRGS.

SN	NTPC Drg. No.	DESCRIPTION
1	4410-001-572-PVE-F-0013	LAYOUT PLAN & SECTION OF 400/220kV SWITCHYARD AT NKSTPP END
2	4410-001-572-PVE-F-0038	400/220 kV – EQUIPMENT EARTHING PHILOSOPHY & DETAILS

NTPC DRG. No. 4410-001-572-PVE-F-0034

PROJECT: NORTH KARANPURA SUPER THERMAL POWER PROJECT (3x660MW)

OWNER: NTPC Limited (A GOVERNMENT OF INDIA ENTERPRISE)

QBTQM

BHARAT HEAVY ELECTRICALS LTD POWER SECTOR TRANSMISSION BUSINESS GROUP NOIDA

JOB NO.	83011	JOB NO.	83011
STATUS	CONTRACT	STATUS	CONTRACT
	DISTRIBUTION		DISTRIBUTION
	TD		TD

No.	OF	No.	OF

REV.	DATE	ALTD	CHD	APPD
01	26.04.18	AK	AK	DKM

DRAWING REVISED TO INCORPORATE NTPC COMMENTS ON RO.

DEPT		NAME	SIGN	DATE
CODE	DRN	AK	-sd-	20.10.15
M	DESN	AK	-sd-	20.10.15
	CHD	MM	-sd-	21.10.15
	APPD	AS	-sd-	26.10.15

TITLE: 400/220 kV – EARTHING LAYOUT – OVERALL AT NKSTPP END

DEPT. SCALE

SIGN

DATE

DRAWING NO. TB 0 369 316 008

SHEET 01 OF 01 REV. 01

FORMAT SIZE A0

ELECTRONIC FILE NAME: