

REVISED EARTHMAT DESIGN FOR THE PROPOSED 220/110/11 KV SUB-STATION @ SANTHPUR IN AURAD TALUK,BIDAR DISTRICT.

IMPORTANT

* NOT TO SCALE

* THE NO OF CAST IRON PIPE ELECTRODES SHALL BE PROVIDED AS PER GUIDELINES

* BEFORE EXECUTION PLEASE CAREFULLY GO THROUGH THE ENCLOSED GUIDELINES *

* ALL DIMENSIONS ARE IN METER

SALIENT DESIGN FEATURES

AREA COVERED BY EARTHMAT IN SQ MTR	32127
DEPTH OF BURIAL OF EARTHMAT IN MTR	0.9
SPACING BETWEEN MAT CONDUCTOR (M.S. FLAT) IN MTR	3
SIZE OF EARTHMAT CONDUCTOR (M.S.FLAT) IN MM	75 X 8 MM

SPREADING OF GRANITE METAL JELLY OF SIZE 20/25 MM
TO A HEIGHT OF 100 MM OVER THE ENTIRE EARTH MAT AREA.

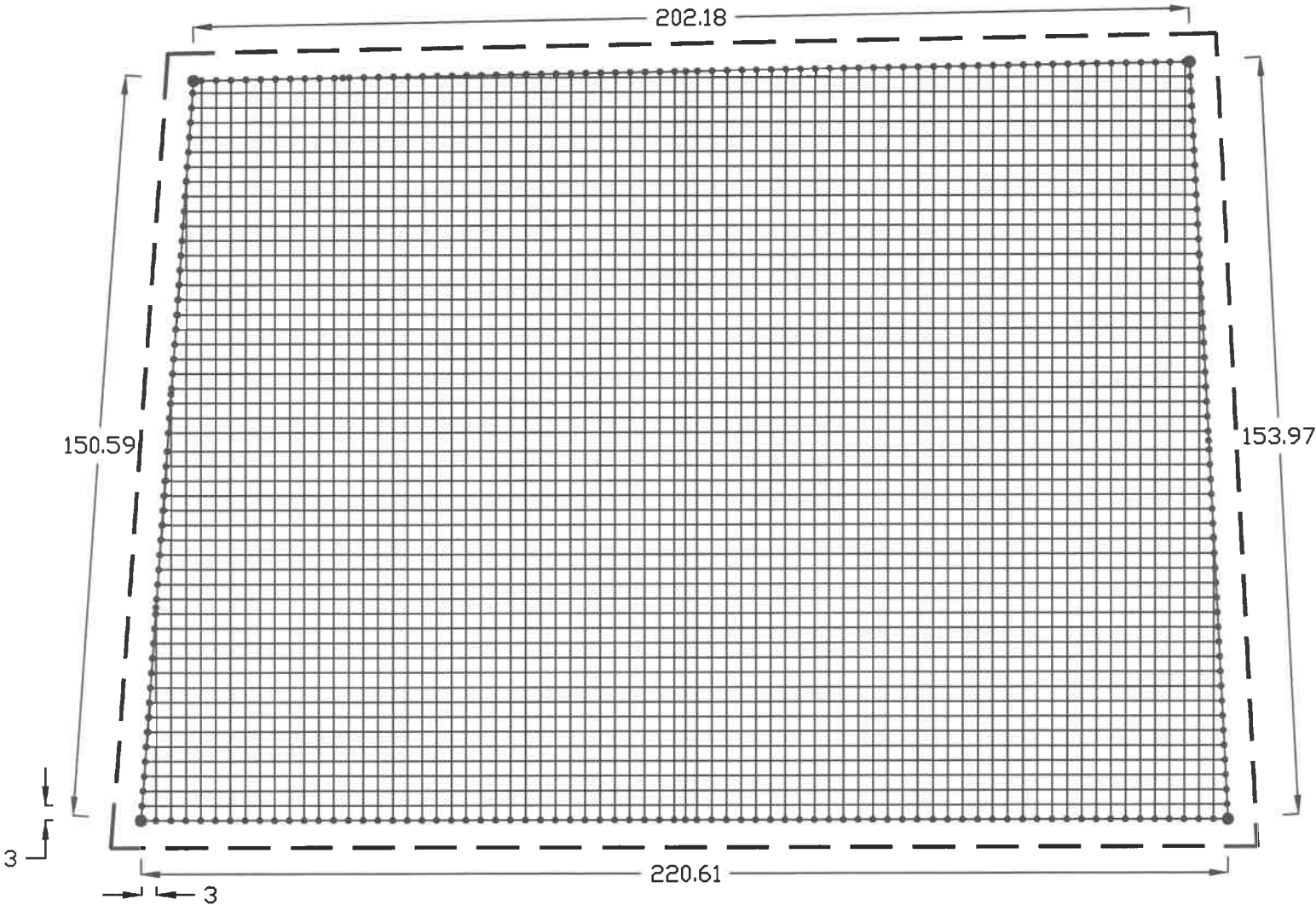
BILL OF MATERIALS (APPROXIMATE QUANTITY) FOR EARTHMAT FORMATION & FENCING.

REF: 1) Letter no.: CEE(P&C)/SET/EET2/AEE-4/KCO-105/19625/20-21/18393-99 dated: 06.03.2021 of the CEE, P&C.

2) The Layout Drawing No.: KPTCL/TECH/SS-220/SNTPR-4 dated: 27.01.2021 of the CEE, P&C.

1. Excavation,formation,refilling	10340	Cmtr.
2. Material for formation of earthmat as per specification		
a) M.S.Flat 75 X 8 MM	23208	Mtr.
b) MS Round rods 25 mm dia,1.05 Mt. long	248	No.
c) G.I.Flats 75 X 8 MM for earth connection	8640	Mtr.
d) Cast iron pipe electrodes of 100 mm Id,13 mm thick,2.75 mtr.long	106	No.
e) Spreading of Granite metal jelly of size 20/25 mm size to a height of 100 mm	3213	Cmtr.
f) 40mm Dia Deep Bore Electrodes of 10Mtr. long with atleast 20Mtr. spacing between any two consecutive electrodes.	30	No.

NOTE: Designed by considering Power transformer capacity of 3x100MVA (1x100MVA future), 220/110kV class + 2x10MVA (1x10MVA future), 110/11kV class .



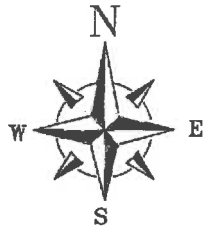
- 30 No.'s of 40mm Dia Deep Bore Electrodes of 10Mtr long, with atleast 20Mtr. spacing between any two consecutive electrodes shall be provided within the earth mat area at suitable locations duly following R&D Guidelines.
- This Drawing Supersedes all the earlier earth mat drawings furnished by this office.

- — FENCE SHALL BE AT A MINIMUM DISTANCE OF 1.5 METERS AWAY FROM THE PERIPHERY OF THE STATION EARTHMAT
- 25 MM DIA M.S. ROUND RODS OF LENGTH ONE METER TO BE DRIVEN AS SHOWN
- C.I.PIPE ELECTRODES PROPOSED (Minimum spacing of 5.5m shall be maintained between any two electrodes)

R & D CENTRE, K P T C L

DRG NO. SEE/R&D/EEE/KCO-126/F-33(07)/2024-25/R1 Dtd.30-1-2025

Shankmugger 30.01.25	S. Anusha 30/1/2025	30.1.2025
AEEE	EEE	SEE



Note:-
X = Easting Ordinate
Y = Northing Ordinate

AREA WITHIN BOUNDARY POINTS

45798.4892 Sqmt
492970.8349694 Sqft
11 ACRE 12 GUNTHA

BOUNDARY			
POINTS	LENGTH(M)	STATION	ANGLE
A TO B	205.0612	A	95°
B TO C	154.7380	B	92°
C TO D	114.9762	C	72°
D TO E	241.7942	D	67°
E TO A	159.5011	E	113°

CO-ORDINATE

POINT ID	EASTING	NORTHING	ELEVATION
A	X = 119847.5160	Y = 2009971.3210	Z = 561.2450
B	X = 119851.2568	Y = 2009766.2939	Z = 561.2450
C	X = 120124.4348	Y = 2009762.1289	Z = 561.2450
D	X = 119582.1295	Y = 2009768.9260	Z = 561.2450
E	X = 119694.4630	Y = 2009983.0420	Z = 558.2940

LEGEND:

PROPOSED ROUTE	—	STONE PEG / LINE PEG	○
EXISTING 220KV TOWER LINE	—	RIVER / CREEK / NALLA	~
EXISTING 132KV TOWER LINE	—	FENCING	—○—
N.H./S.H. / ROAD	—	WELL	⊙
CART TRACK	—	TREE	🌳
H.T.LINE	—	BUND	—
L.T.LINE	—	DAM / POND	—
BENCH MARK	⊙	TRIAL PITS/ BORELOG WITH TP	⊙
		RESERVED/PROTECTED FOREST	—

- FOR DETAILS OF BOUNDARY DIMENSIONS & CO-ORDINATES, REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
- CONTROL ROOM OF SIZE 19.3 X 28.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
- TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X-Y' WITH CO-ORDINATES OF POINTS GIVEN BELOW.

POINTS	S-N	W-E
X	2009785.4	119785.7
Y	2009785.4	119827.7

- FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURE/ MOUNTING STRUCTURE REFER ANNEXURE- SCHEDULE OF REQUIREMENT.
- LIGHTING/ LIGHTNING MAST (LM) ARE PROPOSED FOR ILLUMINATION OF STATION YARD & LIGHTNING PROTECTION. ADDITIONAL LIGHTING MASTS MAY BE PROVIDED FOR SUFFICIENT ILLUMINATION/ LIGHTNING PROTECTION (DGLP) OF THE STATION YARD, IF NECESSARY.
- OTHER REFERENCE DRAWINGS - a) LAYOUT PLAN
b) SITE PLAN WITH BLOCK LEVELS.
c) CROSS SECTION THROUGH VARIOUS BAYS.
d) TYPES OF CABLE DUCT.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

SITE PLAN WITH BLOCK LEVEL OF 220/110/11KV SUB STATION AT SANTHPUR, AURAD TALUK, BIDAR DISTRICT.

DRG. NO. KPTCL/TECH/SS-220/SHTPR-2 DATED:-27.01.2021 SCALE :- N.T.S.

AE	AE	EE	S.E.E (TECH)	C.E.E (PAC)
DRW	CHD	SUB	REC	APPROVED

NOTES:-

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
- RIGID BUS IS PROPOSED FOR 220KV & 110KV MAIN DOUBLE BUS.
- RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/110/11KV TRANSFORMERS ON BED IN BOTH AXES.
- a) 220KV & 110KV YARD WITH BOUNDARY 'APBCRQEA' SHALL BE MAINTAINED AT THREE DIFFERENT LEVELS. THE RL, FGL AND CUTTING & FILLING QUANTITIES SHALL BE AS FOLLOWS.

	BOUNDARY	RL (M)	CUTTING (CU.M)	FILLING (CU.M)
220KV BUS & 220KV YARD	"BQBS"	565.0	8220.83	2847.8
220/110/11KV WFL & 110/11KV WFL	"BQPS"	564.0	5519.38	6343.87
110KV BUS & 110KV YARD	"PQEP"	561.5	1804.0	7914.10

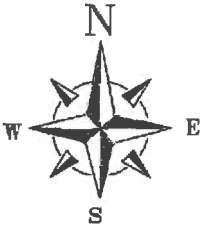
- SWITCH YARD FENCING SHALL BE PROVIDED ALONG BOUNDARY LINE 'CE'. SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'EAPBC' & PERIPHERY COMPOUND WALL SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'CD' AND 'DE'.
- TOW/RETAINING WALL SHALL BE PROVIDED WHERE EVER NECESSARY ALONG THE BOUNDARY LINE.
- ROD RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE 'SR' & 'PQ'.

CONSULTING ENGINEERS
AAKAR ABHINAV
CONSULTANTS PRIVATE LIMITED
ENGINEERS, ARCHITECTS, PLANNING & GRAPHIC DESIGNERS
C-45/4/6, KUMARIA DOWNS FLOOR NO 18, SECTOR - 11, C&D RELAXER, NEW MARKET, KOTDA
I-451 022 2728012, FAX: 01-022-2727230
E-MAIL: aakarabhinav@gmail.com

CLIENT:
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

PROJECT: CONDUCTING CONTOURING AND GEO-TECHNICAL INVESTIGATION FOR 220KV R/S SANTHPUR AT NAGDOOR (B) VILLAGE IN AURAD (B) TALUK, BIDAR DISTRICT
TITLE: GRID LEVEL AT 5M INTERVAL
PROJECT NO. 1562 REV. R0 SCALE 1:1000 A1

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Note:-
X = Easting Ordinate
Y = Northing Ordinate

AREA WITHIN BOUNDARY POINTS

45798.4892 Sqmt
492970.8349694 Sqft
11 ACRE 12 GUNTHA

BOUNDARY			
POINTS	LENGTH(M)	STATION	ANGLE
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LEGEND:

PROPOSED ROUTE	—	STONE PEG / LINE PEG	○
EXISTING 220KV TOWER LINE	—	RIVER / CREEK / NALLA	~
EXISTING 132KV TOWER LINE	—	FENCING	—
N.H./S.H. / ROAD	—	WELL	⊙
CART TRACK	—	TREE	⊙
H.T.LINE	—	BUND	—
L.T.LINE	—	DAM / POND	—
BENCH MARK	⊙	TRIAL PITS/ BORELOG WITH TP	⊙
		RESERVED/PROTECTED FOREST	—

NOTES:-

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
 - RIGID BUS IS PROPOSED FOR 220KV & 110KV MAIN DOUBLE BUS.
 - RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/110/11KV TRANSFORMERS ON BED IN BOTH AXIS.
 - a) 220KV & 110KV YARD WITH BOUNDARY 'APSBORDEA' SHALL BE MAINTAINED AT THREE DIFFERENT LEVELS. THE RL, FGL AND CUTTING & FILLING QUANTITIES SHALL BE AS FOLLOWS.
- | | BOUNDARY | RL (M) | CUTTING (CUM) | FILLING (CUM) |
|-----------------------------------|----------|--------|---------------|---------------|
| 220KV BUS & 220KV YARD | 'BORDE' | 586.0 | 8280.83 | 2547.9 |
| 220/110/11KV TRFL & 110/11KV TRFL | 'TRFLS' | 584.0 | 5519.38 | 6343.57 |
| 110KV BUS & 110KV YARD | 'YARD' | 581.5 | 1804.0 | 7914.15 |
- b) SWITCH YARD FENCING SHALL BE PROVIDED ALONG BOUNDARY LINE 'DE', SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'APSBOR' & PERIMETER COMPOUND WALL SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'DE' AND 'DE'.
 - c) TOWER/RETAINING WALL SHALL BE PROVIDED WHERE EVER NECESSARY ALONG THE BOUNDARY LINE.
 - d) RCC RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE 'SR' & 'PG'.

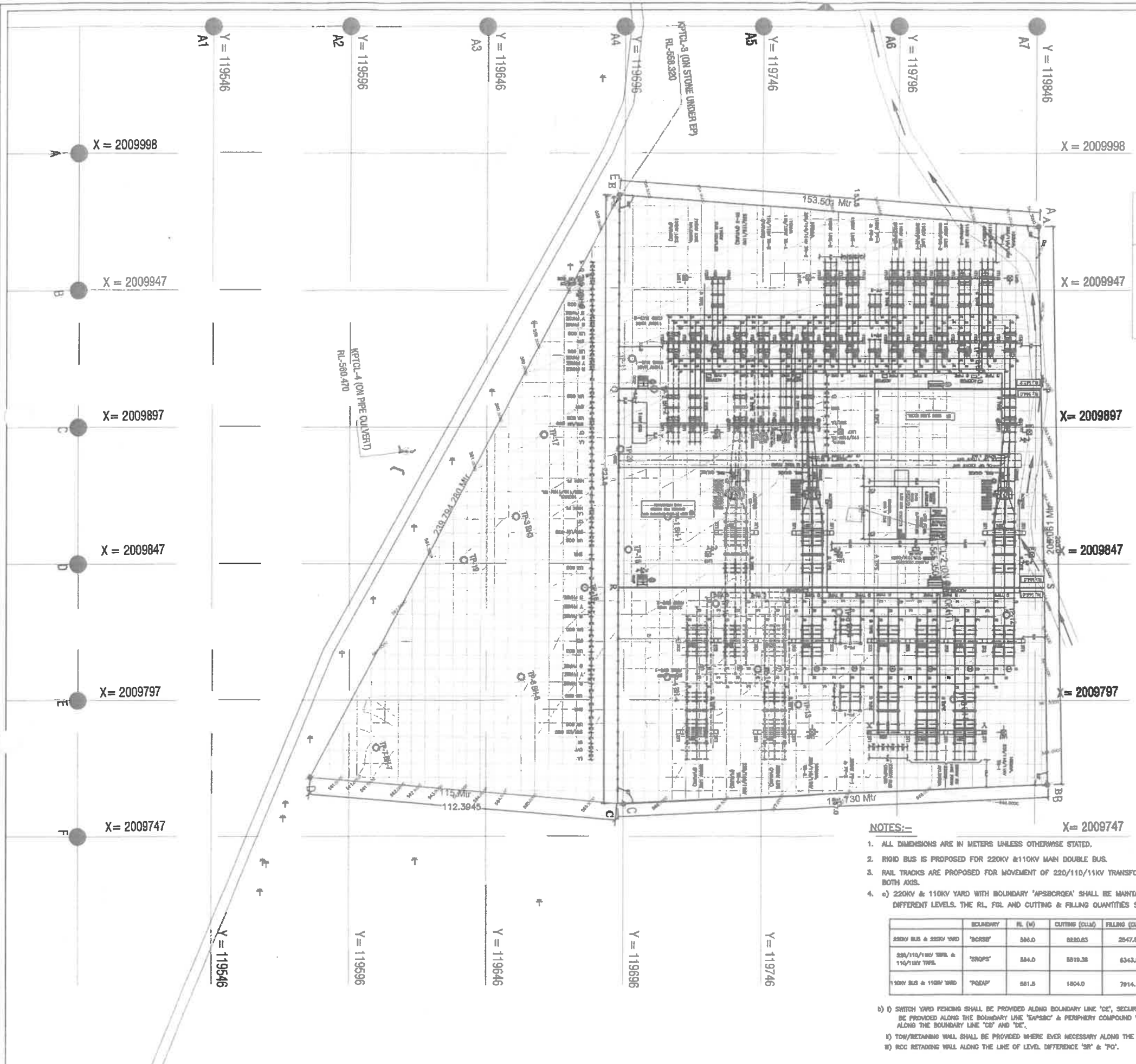
- FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES, REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
- CONTROL ROOM OF SIZE 19.3 X 28.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
- TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X-C' WITH CO ORDINATES OF POINTS GIVEN BELOW.

POINTS	S-N	W-E
X	2009785.4	119785.7
Y	2009785.4	119827.7

- FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURE/ MOUNTING STRUCTURE REFER ANNEXURE- SCHEDULE OF REQUIREMENT.
- LIGHTNING/ LIGHTNING MAST (LM) ARE PROPOSED FOR ILLUMINATION OF STATION YARD & LIGHTNING PROTECTION. ADDITIONAL LIGHTING MASTS MAY BE PROVIDED FOR SUFFICIENT ILLUMINATION/ LIGHTNING PROTECTION (DISP) OF THE STATION YARD, IF NECESSARY.
- OTHER REFERENCE DRAWINGS - a) LAYOUT PLAN
b) SITE PLAN WITH BLOCK LEVELS.
c) CROSS SECTION THROUGH VARIOUS BAYS.
d) TYPES OF CABLE DUCT.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED
SITE PLAN WITHOUT BLOCK LEVEL OF 220/110/11KV SUB STATION AT SANTHPUR, AURAD TALUK, BIDAR DISTRICT.

DRG. NO. KPTCL/TECH/SS-220/SHTPR-3	DATED:-27.01.2021	SCALE:- N.T.S.
AE	EE	S.E.E (TECH)
DRN	CHD	SUB
		REC
		APPROVED



CONSULTING ENGINEERS
AAKAR ABHINAV
CONSULTANTS PRIVATE LIMITED
ENGINEERS, ARCHITECTS, PLANNERS & GRAPHIC DESIGNERS
C-401/110, KUNDEJA CENTER, PLOT NO.13, SECTOR - 11, C.B.D. BELAPUR, NAVI MUMBAI - 400 054.
E-91 022 27580192, FAX: 91-022-27572303
E-MAIL: info@akarabhinav.com

CLIENT:
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

PROJECT: CONDUCTING CONTOURING AND GEO-TECHNICAL INVESTIGATION FOR 220KV RIS SANTHPUR AT NAGDOOR (B) VILLAGE IN AURAD (B) TALUK, BIDAR DISTRICT

TITLE: GRID LEVEL AT 5M INTERVAL.

DRG NO:	PROJECT NO. 1592	REV. R0	SCALE 1:1000	A1
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TECHNICAL PARTICULARS

SL.NO.	PARTICULARS	220KV	110KV
1.	BASIC INSULATION LEVEL (KV)	1050	550
2.	MINIMUM CLEARANCES		
	a) BETWEEN PHASES (FOR RIGID BUS)	3.35 M	2.0 M
	b) BETWEEN PHASES (FOR STRUNG BUS)	3.65 M	2.0 M
	c) BETWEEN PHASE TO EARTH (CENTRE LINE OF TOWER)	3.35 M	2.1 M
	d) SECTIONAL CLEARANCE	4.3 M	3.5 M
3.	a) HEIGHT OF CROSS BUS CONDUCTOR	13.5 M	11 M
	b) BAY WIDTH	14.0 M	8.2 M
	c) HEIGHT OF MAIN BUS	5.75 M	4.6 M
4.	HEIGHT OF CENTRE OF TERMINAL PAD PERTAINING TO VARIOUS EQUIPMENTS		
	a) ISOLATORS ADJACENT TO MAIN BUS	8.25 M	6.35 M
	b) OTHER ISOLATORS AND EQUIPMENTS	5.75 M	4.6 M
5.	MATERIALS OF THE BUS		
	a) MAIN ALUMINIUM TUBE BS 1600 SCH.40	75 MM DIA	75 MM DIA
	b) CROSS BUS		
	i) ALUMINIUM TUBE BS.1600 SCH.40	63 MM DIA	63 MM DIA
	ii) ACSR CONDUCTOR	DRAKE	DRAKE
6.	POST INSULATORS USED FOR BUS SUPPORTS AS PER IS 5350 PART II & III		
	a) NO.OF UNITS/STACK	2	1
	b) VOLTAGE CLASS	220KV	110KV
	c) HEIGHT OF INSULATOR STACK (MM)	2300	1220
	d) PITCH DIA HOLES AT TOP (MM)	127	127
	e) NO. OF FIXING BOLTS	4	4
7.	a) 11KV, 120KN DISC INSULATORS		
	i) TENSION STRING	16	8
	B) 11KV, 90KN DISC INSULATORS		
	i) SUSPENSION STRING	14	8

8. ROUTE OF PROPOSED CABLE DUCT FOR A,B,C&D TYPES ARE INDICATED IN THE LAYOUT PLAN. FROM MAIN DUCTS ie. A/B/C/D TYPE TO THE RESPECTIVE EQUIPMENTS 'E' TYPE HUME PIPE SHALL BE PROVIDED FOR THE COMBINATION OF CONTROL & POWER CABLE AND 'F' TYPE SHALL BE PROVIDED FOR ONLY CONTROL/ POWER CABLE. REFER TYPES OF CABLE DUCTS DRAWING FOR OTHER DETAILS.

9. OTHER REFERENCE DRAWINGS – a) LAYOUT PLAN
b) SITE PLAN WITH BLOCK LEVELS.
c) CROSS SECTION THROUGH VARIOUS BAYS.
d) TYPES OF CABLE DUCT.

NOTES:—

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
- RIGID BUS IS PROPOSED FOR 220KV & 110KV MAIN DOUBLE BUS.
- RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/110/11KV TRANSFORMERS ON BED IN BOTH AXIS.
- a) 220KV & 110KV YARD WITH BOUNDARY 'APSBQRQEA' SHALL BE MAINTAINED AT THREE DIFFERENT LEVELS. THE RL, FGL AND CUTTING & FILLING QUANTITIES SHALL BE AS FOLLOWS.

	BOUNDARY	RL (M)	CUTTING (CU.M)	FILLING (CU.M)
220KV BUS & 220KV YARD	'BCRSB'	566.0	8220.83	2547.8
220/110/11KV TRFS. & 110/11KV TRFS.	'SRQPS'	564.0	5519.38	5343.57
110KV BUS & 110KV YARD	'PQEAP'	561.5	1804.0	7914.15

- b) i) SWITCH YARD FENCING SHALL BE PROVIDED ALONG BOUNDARY LINE 'CE', SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'EAPSB' & PERIPHERY COMPOUND WALL SHALL BE PROVIDED ALONG THE BOUNDARY LINE 'CD' AND 'DE'.
- ii) TOW/RETAINING WALL SHALL BE PROVIDED WHERE EVER NECESSARY ALONG THE BOUNDARY LINE.
- iii) RCC RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE 'SR' & 'PQ'.
- FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES. REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
 - CONTROL ROOM OF SIZE 19.3 X 28.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
 - TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X'-'Y' WITH CO ORDINATES OF POINTS GIVEN BELOW (**).

POINTS	S-N	W-E
X	2009785.4	119785.7
Y	2009785.4	119827.7

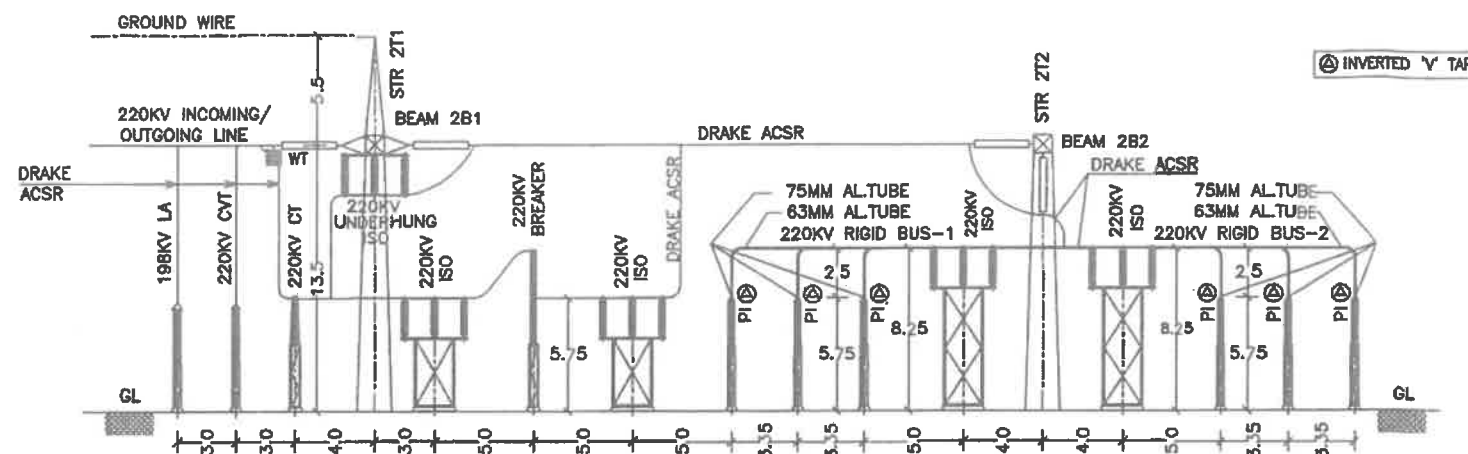
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SHEET 2 OF 2

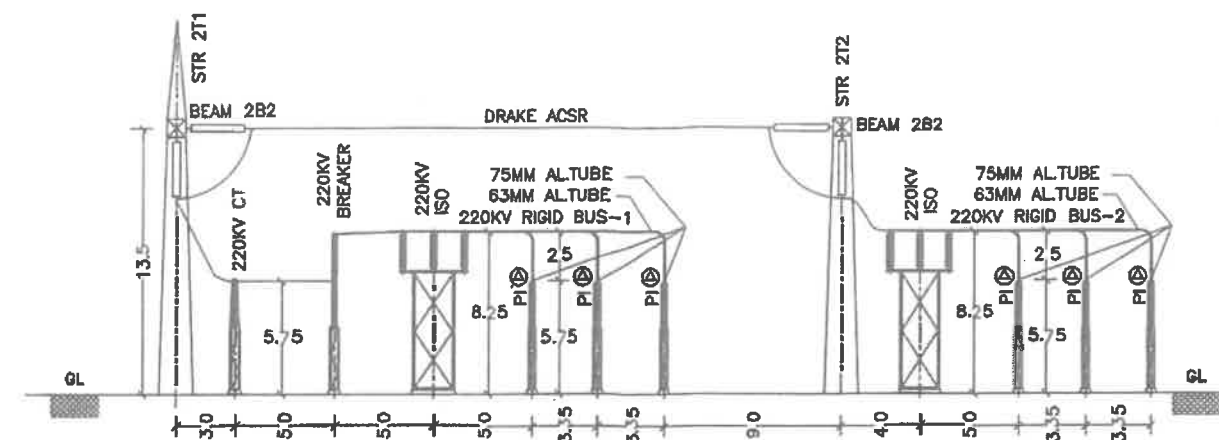
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

TECHNICAL PARTICULARS FOR PROPOSED 220/110/11KV SUB-STATION
AT SANTHPUR, AURAD TALUK, BIDAR DISTRICT.

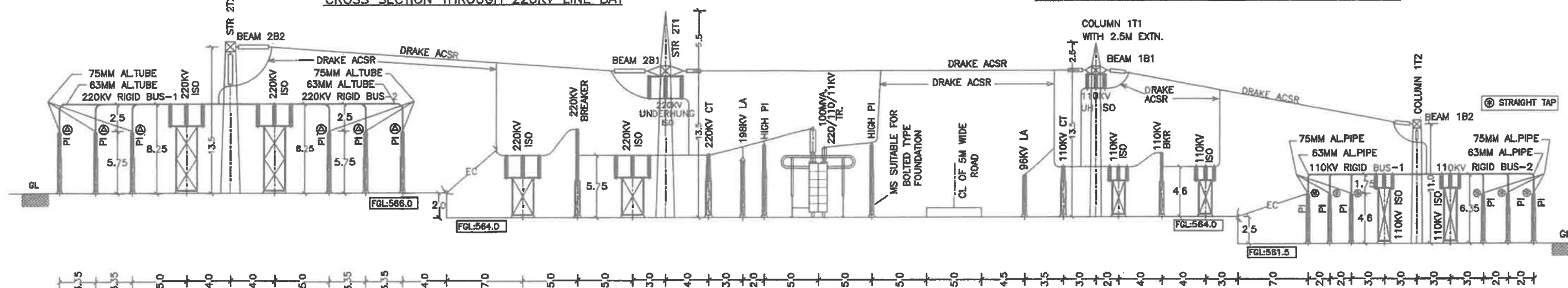
DRG. NO. KPTCL/TECH/SS-220/SNTPR-4	DATE:-27.01.2021	SCALE:- N.T.S
 A.E.	 S.E. (TECH)	 C.E.E (P&C)
DRN	CHD	SUB
	REC	APPROVED



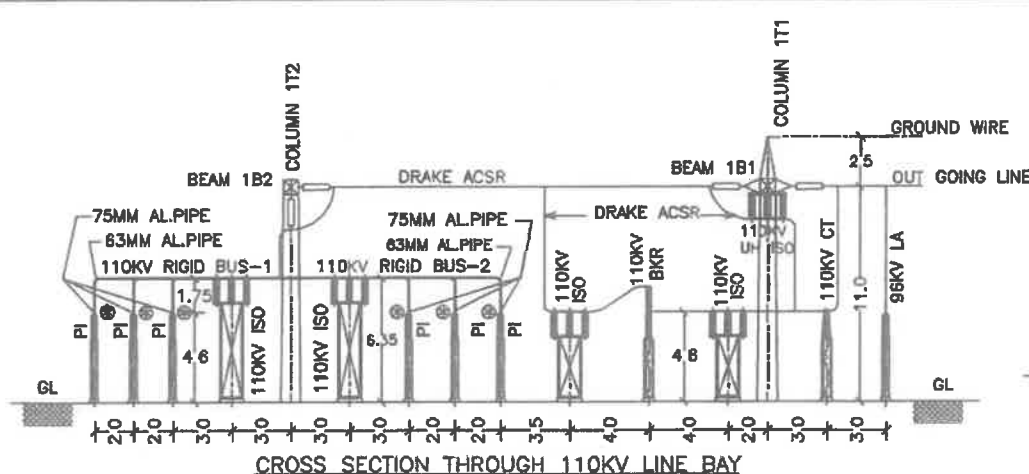
CROSS SECTION THROUGH 220KV LINE BAY



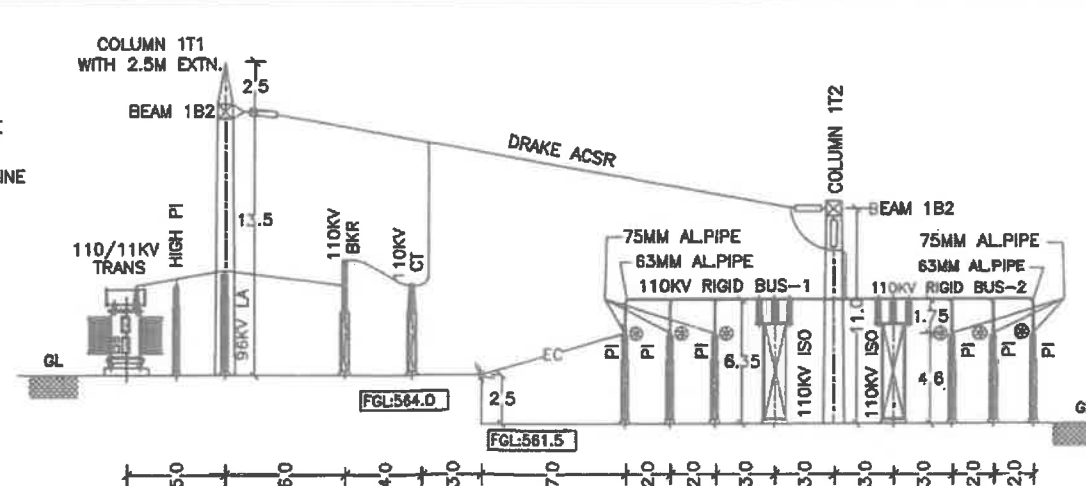
CROSS SECTION THROUGH 220KV BUS COUPLER BAY



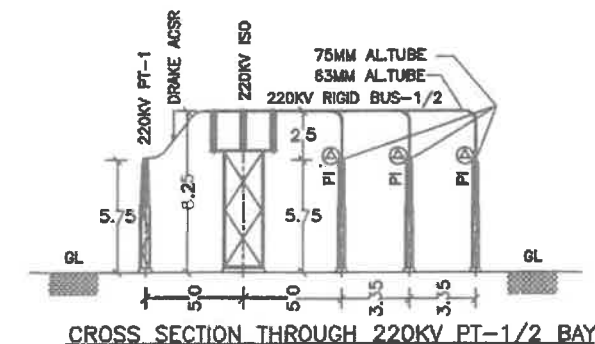
CROSS SECTION THROUGH 100MVA 220/110KV TRANSFORMER BAY



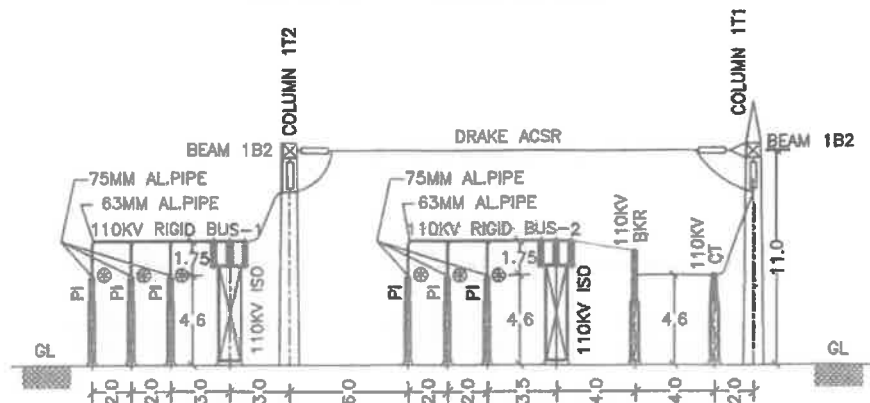
CROSS SECTION THROUGH 110KV LINE BAY



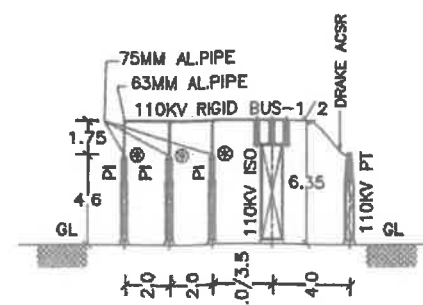
CROSS SECTION THROUGH 110/11KV TRANSFORMER BAY



CROSS SECTION THROUGH 220KV PT-1/2 BAY



CROSS SECTION THROUGH BUS COUPLER BAY



CROSS SECTION THROUGH 110KV PT-1 & 2 BAY

NOTE:-
ALL DIMENSIONS ARE IN METRES.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED				
CROSS SECTION THROUGH VARIOUS 220 & 110KV BAYS AT 220/110/11KV S/S SANTHPUR, AURAD TALUK, BIDAR DIST.				
DRG. NO. KPTCL/TECH/SS-220/SNTPR-5	DATE:-27.01.2021	SCALE:-	N.T.S	
Yell A.E	Manjula E.E	E.E	S.E (TECH)	C.E.E (P&C)
DRN	CHD	SUB	REC	APPROVED