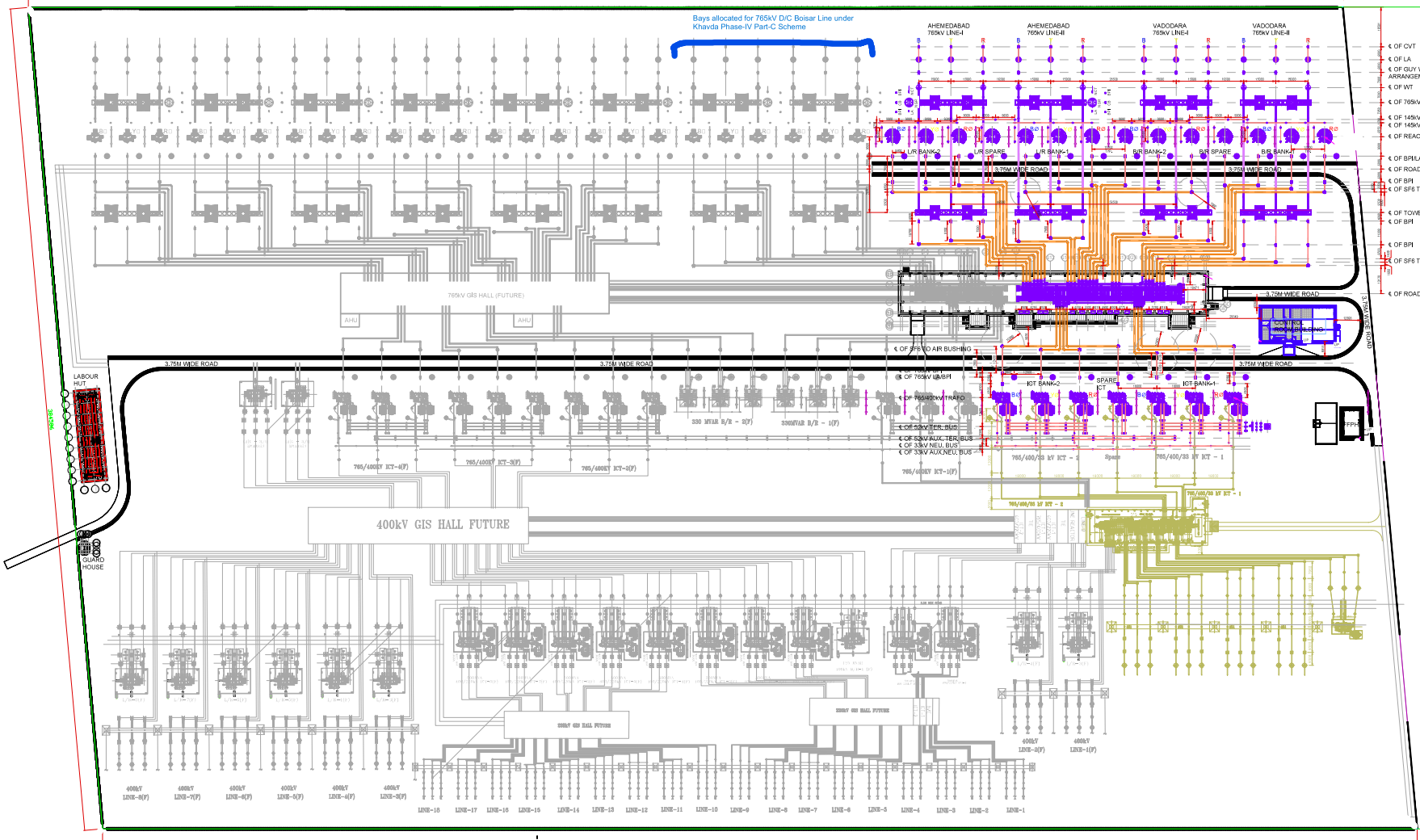




613096

Bays allocated for 765kV DIC Boisar Line under  
Khavda Phase-IV Part-C Scheme



- ◀ OF CVT
- ◀ OF LA
- ◀ OF GUY WIRE ARRANGEMENT
- ◀ OF WT
- ◀ OF 765kV TOWER
- ◀ OF 15kV AUX. BUS
- ◀ OF 15kV NEUL. BUS
- ◀ OF REACTOR
- ◀ OF BR1A
- ◀ OF ROAD
- ◀ OF BR
- ◀ OF SFE TO AIR BUSHING
- ◀ OF TOWER
- ◀ OF BR1
- ◀ OF BR1
- ◀ OF SFE TO AIR BUSHING
- ◀ OF ROAD

VSC AREA

400kV GIS HALL FUTURE

400kV GIS HALL FUTURE

400kV GIS HALL FUTURE

- NOTES
1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIED.
  2. 765kV LINE SIDE EQUIPMENT SHALL BE ON HOLD TILL DEAD END TWR. LOCATION FINALIZATION.
  3. ICT AND REACTOR GA TO BE UPDATED AFTER GETTING GA DRAWING FROM PQCL.
  4. 765kV OUTDOOR GIS ROUTING SHALL BE FINALIZED AFTER GETTING OUTDOOR GIS LAYOUT FROM HYOSUNG.

- LEGEND
- PRESENT SCOPE OF WORK
  - FUTURE / NOT IN SCOPE OF WORK
  - 400kV SIDE LAYOUT IS TENTATIVE AND SHALL BE CONFIRMED AFTER APPROVAL OF THE SAME UNDER S-SAT PACKAGE

- KEC REFERENCE DWG'S
- OVERALL SINGLE LINE DIAGRAM
- HYOSUNG REFERENCE DWG'S
- 765kV GIS SUBSTATION OVERALL LAYOUT

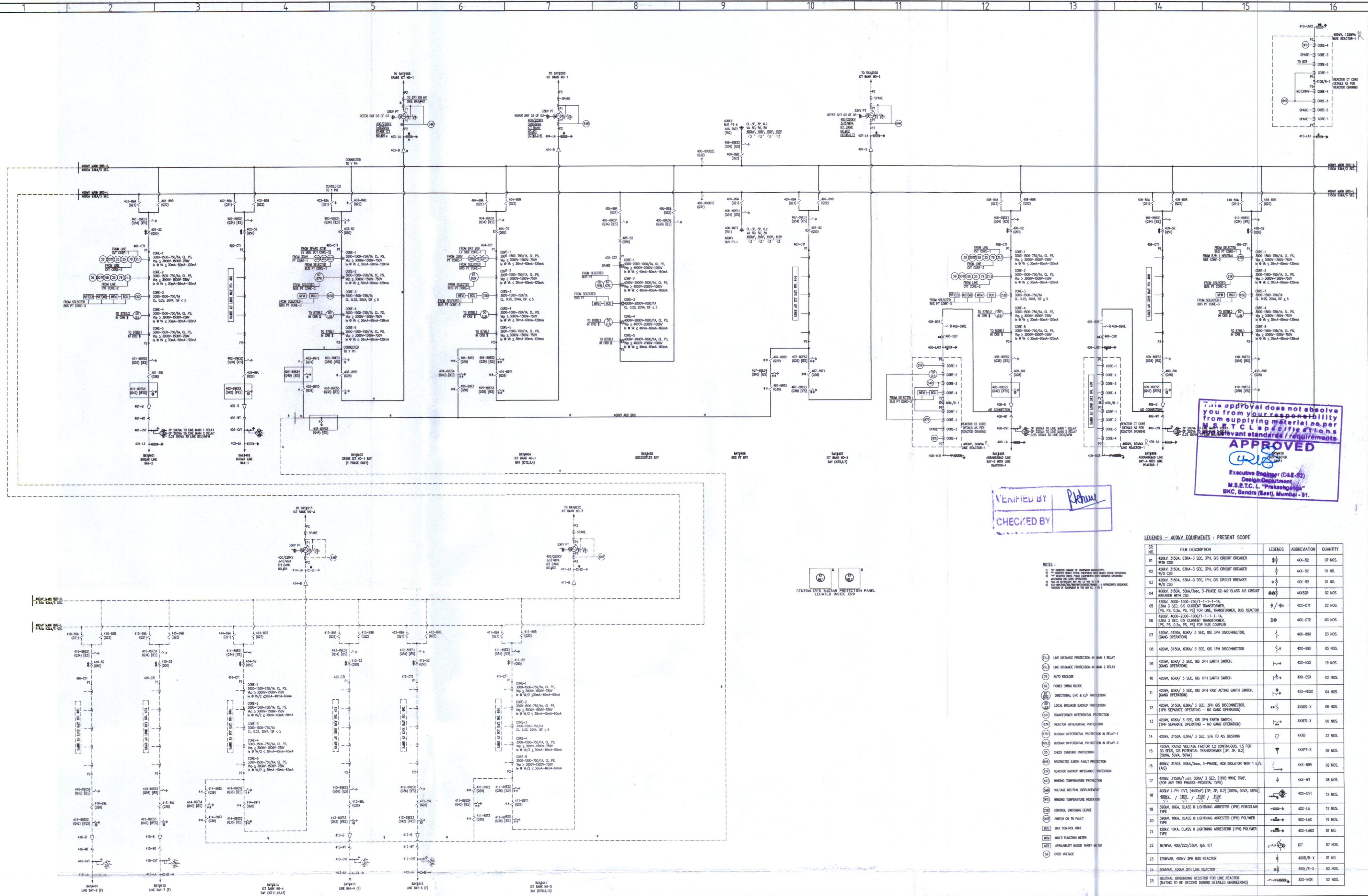
South Olpad/GA, Rev0

613092

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This approval does not absolve you from your responsibility from supplying material as per T.C.L.P. conditions. APPROVED Executive Engineer (D&E-02) Design Department M.S.E.T.C.L. "Prakashganga" BKC, Bandra (East), Mumbai - 51.

VERIFIED BY [Signature] CHECKED BY [Signature]

LEGENDS - 400V EQUIPMENTS : PRESENT SCOPE. Table with columns: SR NO., ITEM DESCRIPTION, LEGENDS, ABBREVIATION, QUANTITY. Includes items like 400V, 315A, 63KA-3 SEC. 3PH. GS CIRCUIT BREAKER, 400V, 315A, 63KA-3 SEC. 3PH. GS CIRCUIT BREAKER, etc.

- NOTES: 1. 30' SPACED... 2. 30' SPACED... 3. 30' SPACED... 4. 30' SPACED... 5. 30' SPACED... 6. 30' SPACED... 7. 30' SPACED... 8. 30' SPACED... 9. 30' SPACED... 10. 30' SPACED... 11. 30' SPACED... 12. 30' SPACED... 13. 30' SPACED... 14. 30' SPACED... 15. 30' SPACED... 16. 30' SPACED... 17. 30' SPACED... 18. 30' SPACED... 19. 30' SPACED... 20. 30' SPACED... 21. 30' SPACED... 22. 30' SPACED... 23. 30' SPACED... 24. 30' SPACED... 25. 30' SPACED...

REFERENCE: 1) TECHNICAL SPECIFICATION 2) TENDER BIDDING DOCUMENT 3) SUBSTATION LAYOUT DRAWING NO. - CLP/PRJ30/PG/002

REVISION HISTORY table with columns: REV. NO., DATE, DESCRIPTION, DRAWN, CHECKED, APPROVED. Includes entries for 02.07.2025 FOR REVIEW AND APPROVAL.

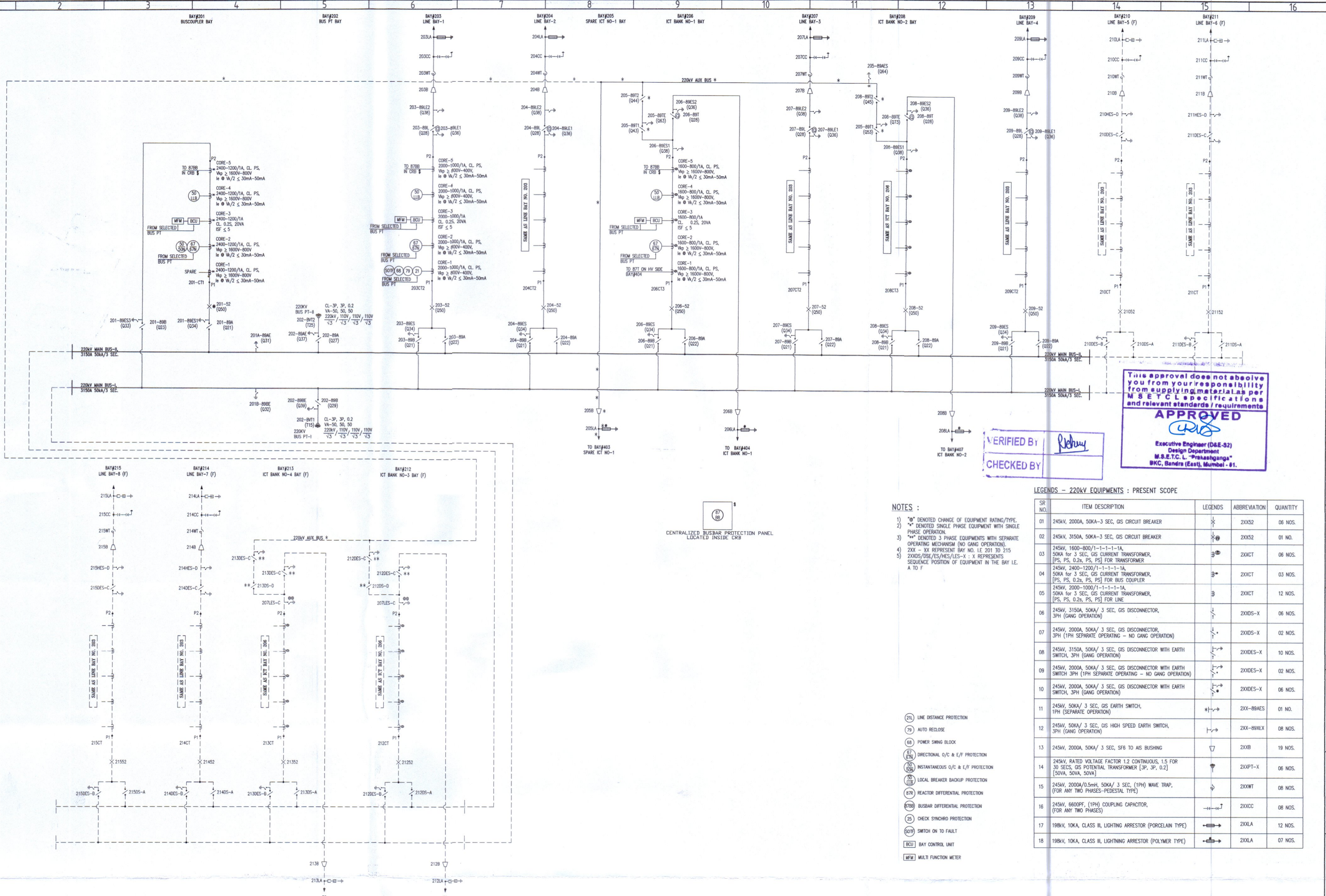
CLIENT: MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD. PLOT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA-KURLA COMPLEX BANDRA (E) MUMBAI - 400 051. PROJECT: ESTABLISHMENT OF 400/220KV GIS SUBSTATION ALONGWITH ASSOCIATED TRANSMISSION LINE AT-SAROLE KHURD (PIMPALGAON) TAL-NIPHAD, DIST. NASHIK UNDER NASHIK ZONE AGAINST TURNKEY CONTRACT. LOA NO.: MSETCL/CO/Projects/PRE-Tender/T-2412/07271 Dated 15.10.2024

stelmec beyond boundaries STELMAC LIMITED MUMBAI

TITLE: PROTECTION SINGLE LINE DIAGRAM FOR 400/220KV GIS PIMPALGAON SUBSTATION (400KV GIS AND AIS PART) SCALE: 1:1000

Table with columns: NAME, SIGN, DATE. Includes entries for DRAWN, CHECKED, APPROVED, and REV. NO. with corresponding names and dates.

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This approval does not absolve you from your responsibility of supplying materials as per I S E T C L specifications and relevant standards / requirements

**APPROVED**

*[Signature]*

Executive Engineer (D&E-S2)  
Design Department  
M.S.E.T.C. L. "Prakashganga"  
BKC, Bandra (East), Mumbai - 41.

VERIFIED BY *[Signature]*

CHECKED BY

**LEGENDS - 220KV EQUIPMENTS : PRESENT SCOPE**

SR NO.	ITEM DESCRIPTION	LEGENDS	ABBREVIATION	QUANTITY
01	245KV, 2000A, 50KA-3 SEC, GIS CIRCUIT BREAKER		2XKS2	06 NOS.
02	245KV, 3150A, 50KA-3 SEC, GIS CIRCUIT BREAKER		2XKS2	01 NO.
03	245KV, 1600-800/1-1-1-1-1A, 50KA for 3 SEC, GIS CURRENT TRANSFORMER, [PS, PS, 0.2s, PS, PS] FOR TRANSFORMER		2XOCT	06 NOS.
04	245KV, 2400-1200/1A, CL, PS, 50KA for 3 SEC, GIS CURRENT TRANSFORMER, [PS, PS, 0.2s, PS, PS] FOR BUS COUPLER		2XOCT	03 NOS.
05	245KV, 2000-1000/1-1-1-1-1A, 50KA for 3 SEC, GIS CURRENT TRANSFORMER, [PS, PS, 0.2s, PS, PS] FOR LINE		2XOCT	12 NOS.
06	245KV, 3150A, 50KA/ 3 SEC, GIS DISCONNECTOR, 3PH (GANG OPERATION)		2XDS-X	06 NOS.
07	245KV, 2000A, 50KA/ 3 SEC, GIS DISCONNECTOR, 3PH (1PH SEPARATE OPERATING - NO GANG OPERATION)		2XDS-X	02 NOS.
08	245KV, 3150A, 50KA/ 3 SEC, GIS DISCONNECTOR WITH EARTH SWITCH, 3PH (GANG OPERATION)		2XDES-X	10 NOS.
09	245KV, 2000A, 50KA/ 3 SEC, GIS DISCONNECTOR WITH EARTH SWITCH 3PH (1PH SEPARATE OPERATING - NO GANG OPERATION)		2XDES-X	02 NOS.
10	245KV, 2000A, 50KA/ 3 SEC, GIS DISCONNECTOR WITH EARTH SWITCH, 3PH (GANG OPERATION)		2XDES-X	06 NOS.
11	245KV, 50KA/ 3 SEC, GIS EARTH SWITCH, 1PH (SEPARATE OPERATION)		2X-BBSES	01 NO.
12	245KV, 50KA/ 3 SEC, GIS HIGH SPEED EARTH SWITCH, 3PH (GANG OPERATION)		2X-BBSES	08 NOS.
13	245KV, 2000A, 50KA/ 3 SEC, SFB TO AIS BUSHING		2XOB	19 NOS.
14	245KV, RATED VOLTAGE FACTOR 1.2 CONTINUOUS, 1.5 FOR 30 SECS, GIS POTENTIAL TRANSFORMER [3P, 3P, 0.2]		2XOPT-X	06 NOS.
15	245KV, 2000A/0.5mH, 50KA/ 3 SEC, (1PH) WAVE TRAP, (FOR ANY TWO PHASES-PEDESTAL TYPE)		2XWTT	08 NOS.
16	245KV, 6600PF, (1PH) COUPLING CAPACITOR, (FOR ANY TWO PHASES)		2XCC	08 NOS.
17	198KV, 10KA, CLASS III, LIGHTNING ARRESTOR (PORCELAIN TYPE)		2XOLA	12 NOS.
18	198KV, 10KA, CLASS III, LIGHTNING ARRESTOR (POLYMER TYPE)		2XOLA	07 NOS.

**NOTES :**

- \* DENOTED CHANGE OF EQUIPMENT RATING/TYPE.
  - \* DENOTED SINGLE PHASE EQUIPMENT WITH SINGLE PHASE OPERATION.
  - \*\* DENOTED 3 PHASE EQUIPMENTS WITH SEPARATE OPERATING MECHANISM (NO GANG OPERATION).
  - 200 - XX REPRESENT BAY NO. IE 201 TO 215
  - 2X00S/02S/HES/LES-X : X REPRESENTS SEQUENCE POSITION OF EQUIPMENT IN THE BAY I.E. A TO F.
- (21L) LINE DISTANCE PROTECTION
  - (79) AUTO RECLOSE
  - (66) POWER SWING BLOCK
  - (67/67N) DIRECTIONAL O/C & E/F PROTECTION
  - (50) INSTANTANEOUS O/C & E/F PROTECTION
  - (50 LIB) LOCAL BREAKER BACKUP PROTECTION
  - (67R) REACTOR DIFFERENTIAL PROTECTION
  - (67BB) BUSBAR DIFFERENTIAL PROTECTION
  - (26) CHECK SYNCHRO PROTECTION
  - (50TF) SWITCH ON TO FAULT
  - (BCU) BAY CONTROL UNIT
  - (MFM) MULTI FUNCTION METER

CENTRALIZED BUSBAR PROTECTION PANEL LOCATED INSIDE CRB

REFERENCE :

- TECHNICAL SPECIFICATION
- TENDER BOB AND SCOPE
- SUBSTATION LAYOUT DRAWING NO. - ELP/PRJ30/PG/002

REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
RO	02.07.2025	FOR REVIEW AND APPROVAL	N.K	G.M.S	G.M.S

CLIENT : **MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD.**  
PLOT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA-KURLA COMPLEX  
BANDRA (E) MUMBAI - 400 051

PROJECT : ESTABLISHMENT OF 400/220KV GIS SUBSTATION ALONGWITH ASSOCIATED TRANSMISSION LINE AT-SAROLE KHURD (PIMPALGAON) TAL-NIPHAD, DIST. NASHIK UNDER NASHIK ZONE AGAINST TURNKEY CONTRACT

LOA NO. : MSETCL/CO/Projects/PRE-Tender/T-2412/07271 Dated 15.10.2024

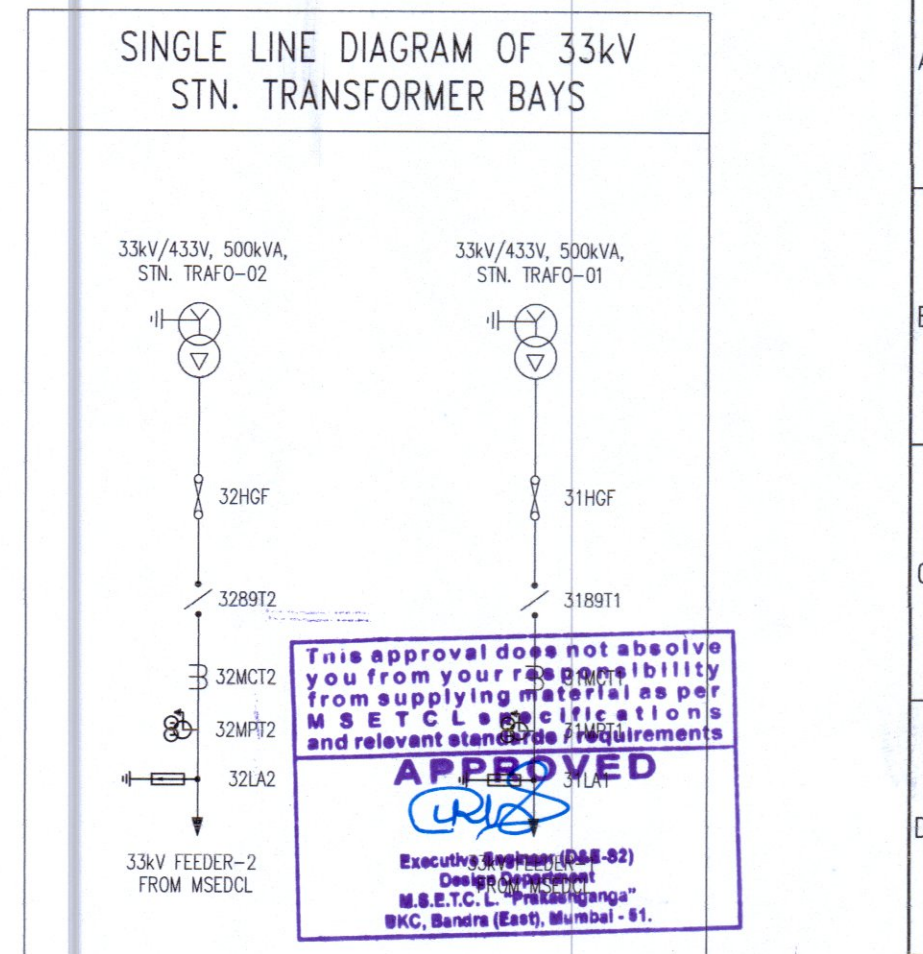
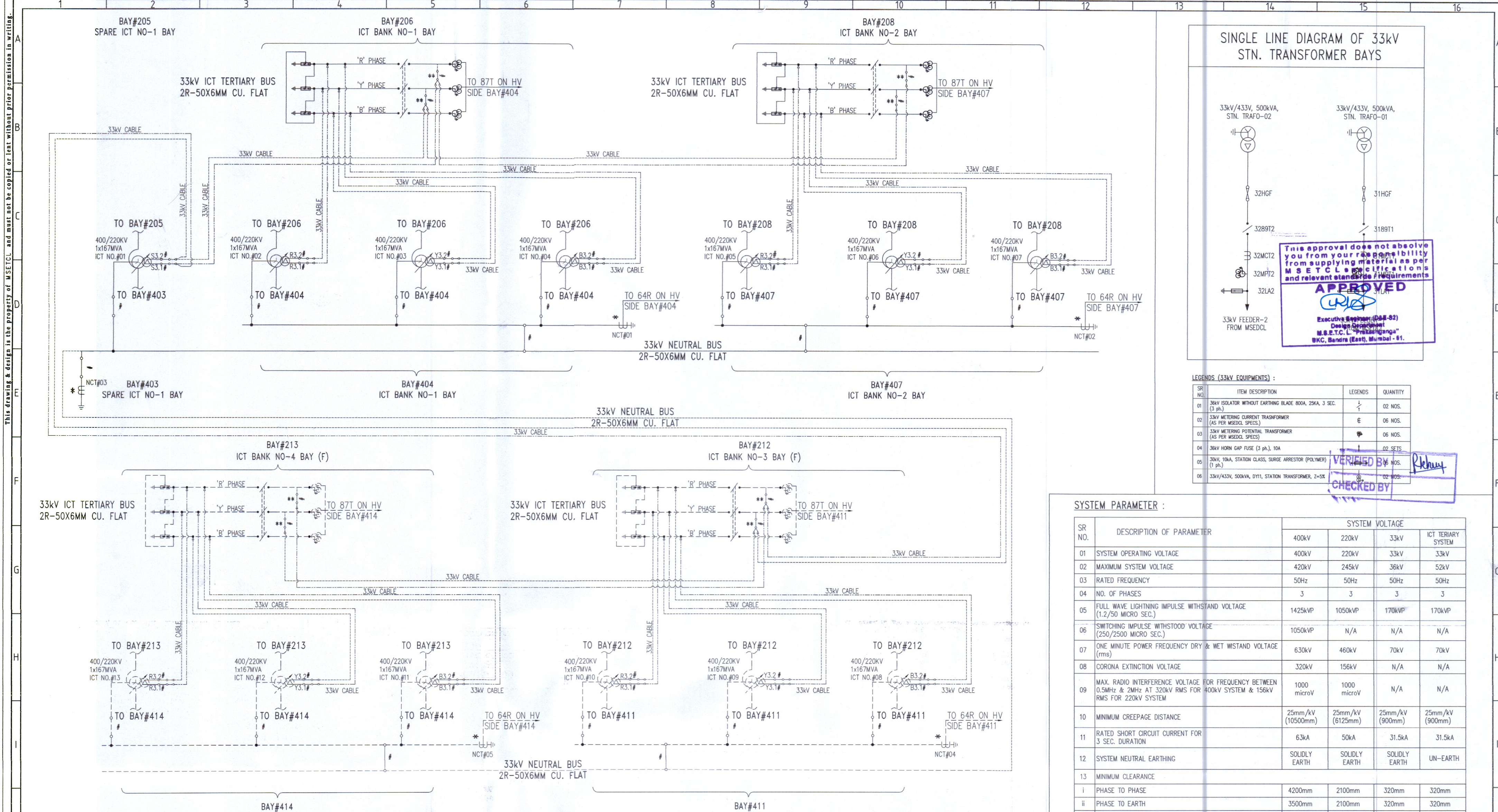
NAME	SIGN	DATE
DRAWN	N.K	02.07.2025
CHECKED	G.M.S	02.07.2025
APPROVED	G.M.S	02.07.2025

TITLE : PROTECTION SINGLE LINE DIAGRAM FOR 400/220KV GIS SUBSTATION (220KV GIS AND AIS PART)

SCALE : 1:1000

DRG. NO. : PS/LD/PRJ30/PG/001

SHEET NO. : 2 OF 3



LEGENDS (33kV EQUIPMENTS):

SR. NO.	ITEM DESCRIPTION	LEGENDS	QUANTITY
01	36kV ISOLATOR WITHOUT EARTHING BLADE 800A, 25KA, 3 SEC. (3 ph.)	⊥	02 NOS.
02	33kV METERING CURRENT TRANSFORMER (AS PER MSEDCL SPECS.)	⊕	06 NOS.
03	33kV METERING POTENTIAL TRANSFORMER (AS PER MSEDCL SPECS.)	⊖	06 NOS.
04	36kV HORN GAP FUSE (3 ph.), 10A	⊕	02 SETS
05	30kV, 10kA, STATION CLASS, SURGE ARRESTOR (POLYMER)	⊕	06 NOS.
06	33kV/433V, 500kVA, DYN11, STATION TRANSFORMER, Z-SK	⊕	02 NOS.

VERIFIED BY: [Signature]  
CHECKED BY: [Signature]

SYSTEM PARAMETER :

SR. NO.	DESCRIPTION OF PARAMETER	SYSTEM VOLTAGE			
		400kV	220kV	33kV	ICT TERTIARY SYSTEM
01	SYSTEM OPERATING VOLTAGE	400kV	220kV	33kV	33kV
02	MAXIMUM SYSTEM VOLTAGE	420kV	245kV	36kV	52kV
03	RATED FREQUENCY	50Hz	50Hz	50Hz	50Hz
04	NO. OF PHASES	3	3	3	3
05	FULL WAVE LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 MICRO SEC.)	1425kVp	1050kVp	170kVp	170kVp
06	SWITCHING IMPULSE WITHSTOOD VOLTAGE (250/2500 MICRO SEC.)	1050kVp	N/A	N/A	N/A
07	ONE MINUTE POWER FREQUENCY DRY & WET WISTAND VOLTAGE (rms)	630kV	460kV	70kV	70kV
08	CORONA EXTINCTION VOLTAGE	320kV	156kV	N/A	N/A
09	MAX. RADIO INTERFERENCE VOLTAGE FOR FREQUENCY BETWEEN 0.5MHz & 2MHz AT 320kV RMS FOR 400kV SYSTEM & 156kV RMS FOR 220kV SYSTEM	1000 microV	1000 microV	N/A	N/A
10	MINIMUM CREEPAGE DISTANCE	25mm/kV (10500mm)	25mm/kV (6125mm)	25mm/kV (900mm)	25mm/kV (900mm)
11	RATED SHORT CIRCUIT CURRENT FOR 3 SEC. DURATION	63kA	50kA	31.5kA	31.5kA
12	SYSTEM NEUTRAL EARTHING	SOLIDLY EARTH	SOLIDLY EARTH	SOLIDLY EARTH	UN-EARTH
13	MINIMUM CLEARANCE				
i	PHASE TO PHASE	4200mm	2100mm	320mm	320mm
ii	PHASE TO EARTH	3500mm	2100mm	320mm	320mm
iii	SAFETY CLEARANCE	6500mm	4300mm	3000mm	3000mm
iv	GROUND CLEARANCE	8200mm	6500mm	3700mm	3700mm
14	INSULATOR				
a)	TENSION DISC INSULATOR	160KN	120KN	120KN	N/A
b)	SUSPENSION DISC INSULATOR	120KN	70KN	70KN	N/A
c)	BPI FOR CONDUCTOR SUPPORT	8KN	6KN	4KN	4KN
d)	BPI FOR WAVE TRAP	8KN	4KN	N/A	N/A
15	NO. OF DISC INSULATOR				
a)	TENSION STRING HARDWARE	24 Nos.	15 Nos.	4 Nos.	N/A
b)	SUSPENSION DISC INSULATOR	23 Nos.	14 Nos.	N/A	N/A

LEGENDS (33kV EQUIPMENTS) :  
FOR ICT NEUTRAL AND TERTIARY BUS ARRANGEMENT:

SR.NO.	ITEM DESCRIPTION	LEGENDS	QUANTITY
01	36kV NCT, 2000/1-1A, 26.2kA/1SEC, LIVE TANK, [PS, 0.5]	⊕*	03 NOS.
02	54/39 10kA, STATION CLASS, CLASS 3, SURGE ARRESTOR (POLYMER) 1ph.	⊕	06 NOS.
03	36kV ISOLATOR WITHOUT EARTHING BLADE 800A, 25KA, 3 SEC. (3 ph.)	⊥	02 NOS.
04	36kV, 10kA, RATED VOLTAGE FACTOR 1.2 TIMES CONTINUOUS, 1.9 FOR 8 HRS POTENTIAL TRANSFORMER [3P, 3P, 0.2] [SOVA, 50VA, 50VA]	⊕	06 NOS.

SR.NO.	ITEM DESCRIPTION	LEGENDS	QUANTITY
05	33kV OUTDOOR CABLE TERMINATION SUITABLE FOR 300SQMM AL SINGLE CORE XLPE CABLE	<J	DDE
06	33kV, 300SQMM AL SINGLE CORE XLPE CABLE	—	DDE
07	2 RUNS OF 50X6MM COPPER FLAT	—	DDE
08	50X6MM COPPER FLAT DISCONNECTING LINK	⊕	DDE

- NOTES :
- "# " DENOTED FOR REMOVABLE LINK IN CASE OF RAPID RESTORATION SCHEME TO REPLACE THE FAULTY UNIT WITH SPARE ICT UNIT.
  - DURING RAPID RESTORATION SCHEME OPERATION PROCESS REMOVABLE LINKS TO BE CONNECTED/DISCONNECTED MANUALLY.
  - UNDER NORMAL CONDITION REMOVABLE LINK DENOTED WITH "##" TO BE KEPT IN OPEN CONDITION.
  - RATING OF 400 & 220kV EQUIPMENTS TO BE REFERRED TO SHEET 01 OF 02.

REFERENCE :  
1) TECHNICAL SPECIFICATION  
2) TENDER BOB AND SCOPE  
3) SUBSTATION LAYOUT DRAWING NO. - ELP/PRJ30/PG/002

CLIENT : MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD.  
PLOT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA-KURLA COMPLEX, BANDRA (E) MUMBAI - 400 051

PROJECT : ESTABLISHMENT OF 400/220kV GIS SUBSTATION ALONGWITH ASSOCIATED TRANSMISSION LINE AT-SAROLE KHURD (PIMPALGAON) TAL-NIPHAD, DIST. NASHIK UNDER NASHIK ZONE AGAINST TURNKEY CONTRACT

LOA NO. : MSETCL/CO/Projects/PRE-Tender/T-2412/07271 Dated 15.10.2024

SCALE : 1:1000

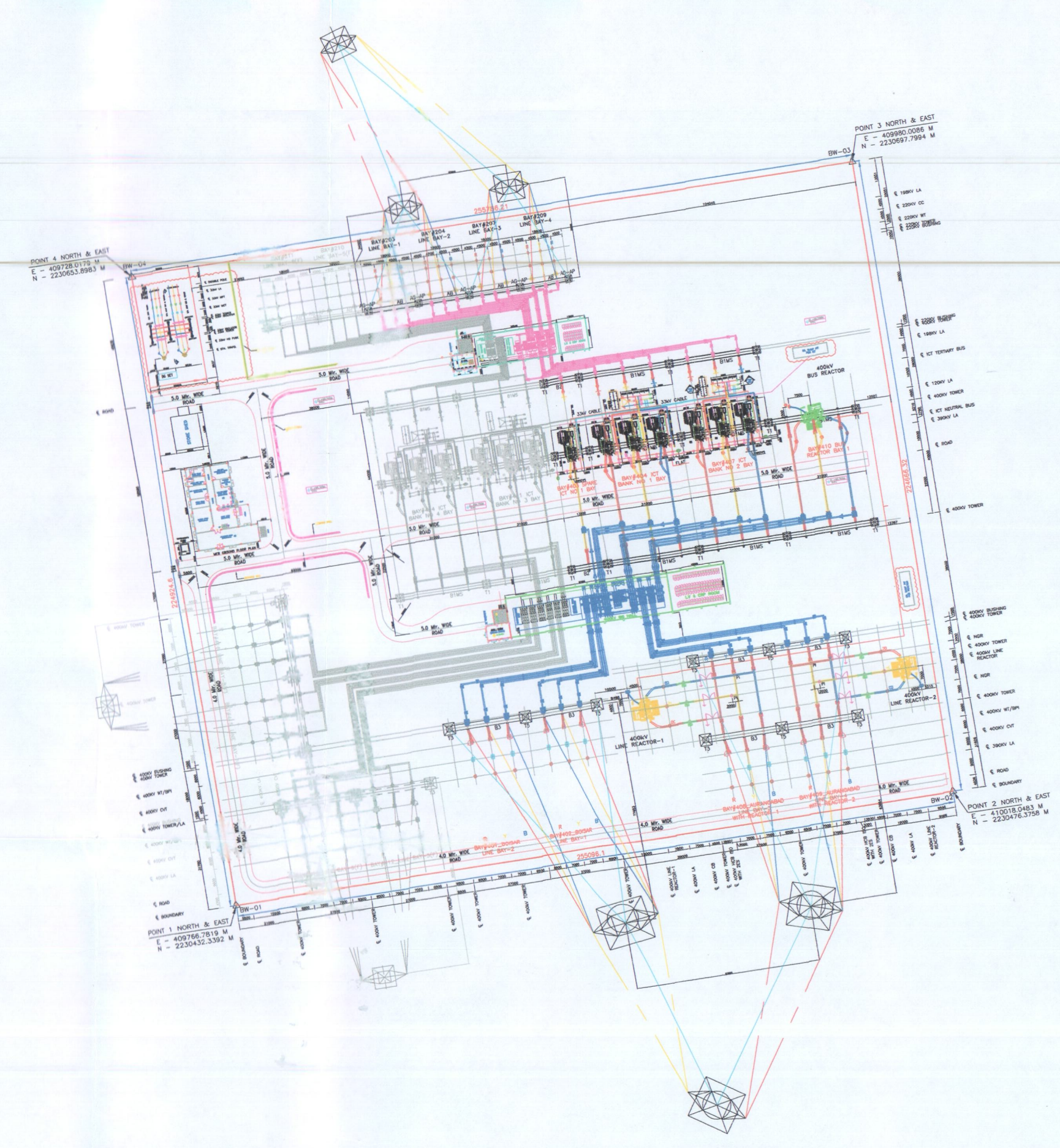
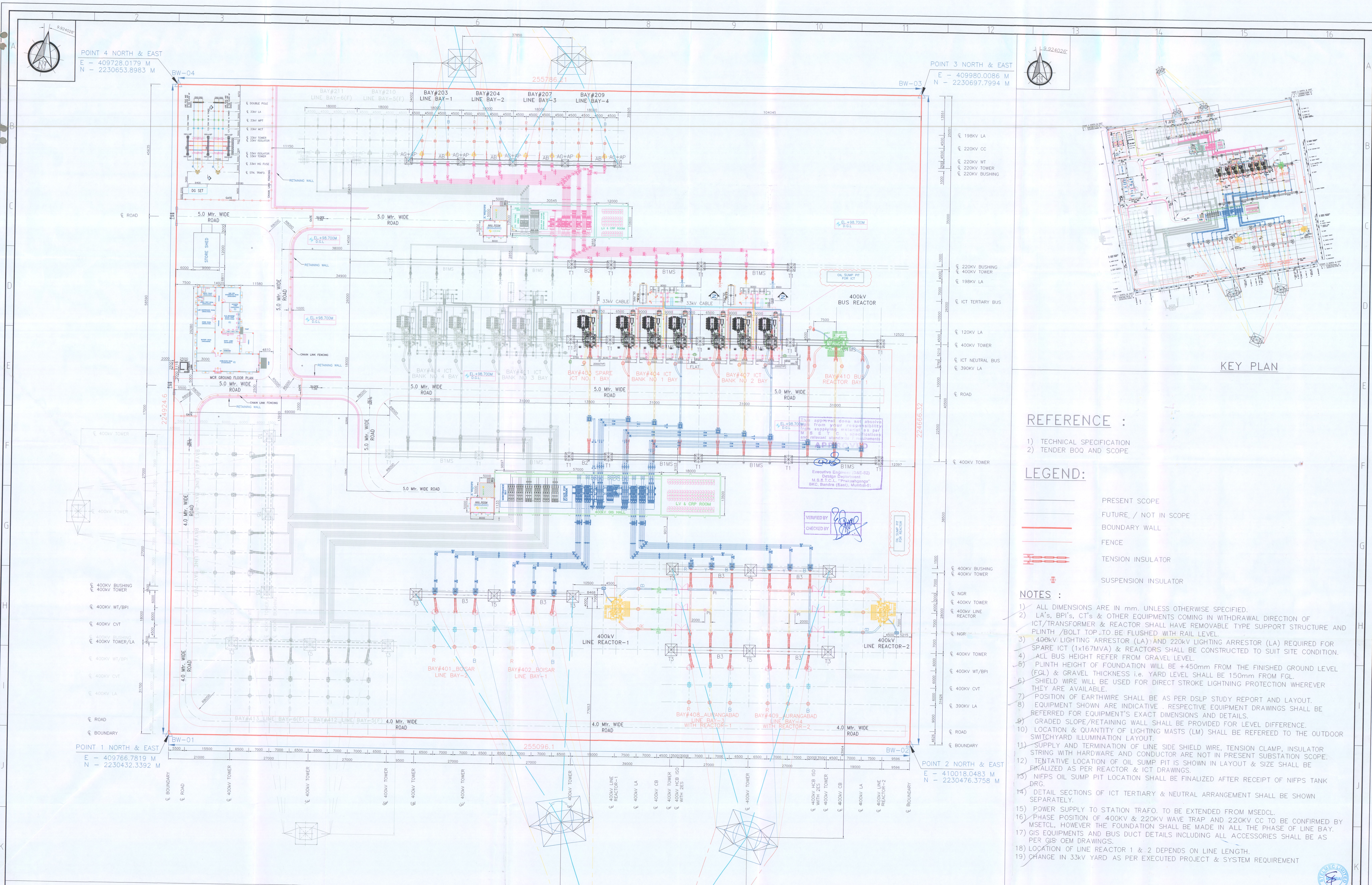
STELMEC LIMITED MUMBAI

TITLE : PROTECTION SINGLE LINE DIAGRAM FOR 400/220kV GIS PIMPALGAON SUBSTATION (33kV PART)

DRG. NO. : PSLD/PRJ30/PG/001  
SHEET NO. : 3 OF 3

REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
RO	02.07.2025	FOR REVIEW AND APPROVAL	N.K	G.M.S	G.M.S

APPROVED : [Signature]  
DATE : 02.07.2025



KEY PLAN

REFERENCE :

- 1) TECHNICAL SPECIFICATION
- 2) TENDER BOQ AND SCOPE

LEGEND :

- PRESENT SCOPE
- FUTURE / NOT IN SCOPE
- BOUNDARY WALL
- FENCE
- TENSION INSULATOR
- SUSPENSION INSULATOR

NOTES :

- 1) ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
- 2) LA's, BPI's, CT's & OTHER EQUIPMENTS COMING IN WITHDRAWAL DIRECTION OF ICT/TRANSFORMER & REACTOR SHALL HAVE REMOVABLE TYPE SUPPORT STRUCTURE AND PLINTH /BOLT TOP TO BE FLUSHED WITH RAIL LEVEL.
- 3) 400kV LIGHTING ARRESTOR (LA) AND 220kV LIGHTING ARRESTOR (LA) REQUIRED FOR SPARE ICT (1x167MVA) & REACTORS SHALL BE CONSTRUCTED TO SUIT SITE CONDITION.
- 4) ALL BUS HEIGHT REFER FROM GRAVEL LEVEL.
- 5) PLINTH HEIGHT OF FOUNDATION WILL BE +450mm FROM THE FINISHED GROUND LEVEL (FGL) & GRAVEL THICKNESS I.E. YARD LEVEL SHALL BE 150mm FROM FGL.
- 6) SHIELD WIRE WILL BE USED FOR DIRECT STROKE LIGHTNING PROTECTION WHEREVER THEY ARE AVAILABLE.
- 7) POSITION OF EARTHWIRE SHALL BE AS PER DSCP STUDY REPORT AND LAYOUT.
- 8) EQUIPMENT SHOWN ARE INDICATIVE. RESPECTIVE EQUIPMENT DRAWINGS SHALL BE REFERRED FOR EQUIPMENT'S EXACT DIMENSIONS AND DETAILS.
- 9) GRADED SLOPE/RETAINING WALL SHALL BE PROVIDED FOR LEVEL DIFFERENCE.
- 10) LOCATION & QUANTITY OF LIGHTING MASTS (LM) SHALL BE REFERRED TO THE OUTDOOR SWITCHYARD ILLUMINATION LAYOUT.
- 11) SUPPLY AND TERMINATION OF LINE SIDE SHIELD WIRE, TENSION CLAMP, INSULATOR STRING WITH HARDWARE AND CONDUCTOR ARE NOT IN PRESENT SUBSTATION SCOPE.
- 12) TENTATIVE LOCATION OF OIL SUMP PIT IS SHOWN IN LAYOUT & SIZE SHALL BE FINALIZED AS PER REACTOR & ICT DRAWINGS.
- 13) NIPPS OIL SUMP PIT LOCATION SHALL BE FINALIZED AFTER RECEIPT OF NIPPS TANK DRG.
- 14) DETAIL SECTIONS OF ICT TERTIARY & NEUTRAL ARRANGEMENT SHALL BE SHOWN SEPARATELY.
- 15) POWER SUPPLY TO STATION TRAFU. TO BE EXTENDED FROM MSEDCL.
- 16) PHASE POSITION OF 400kV & 220kV WAVE TRAP AND 220kV CC TO BE CONFIRMED BY MSETCL, HOWEVER THE FOUNDATION SHALL BE MADE IN ALL THE PHASE OF LINE BAY.
- 17) GIS EQUIPMENTS AND BUS DUCT DETAILS INCLUDING ALL ACCESSORIES SHALL BE AS PER GIS OEM DRAWINGS.
- 18) LOCATION OF LINE REACTOR 1 & 2 DEPENDS ON LINE LENGTH.
- 19) CHANGE IN 33kV YARD AS PER EXECUTED PROJECT & SYSTEM REQUIREMENT

POINT 4 NORTH & EAST  
E - 409728.0179 M  
N - 2230653.8983 M

POINT 3 NORTH & EAST  
E - 409980.0086 M  
N - 2230697.7994 M

POINT 1 NORTH & EAST  
E - 409766.7819 M  
N - 2230432.3392 M

POINT 2 NORTH & EAST  
E - 410018.0483 M  
N - 2230476.3758 M

REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R2	24.09.2025	33kV YARD, AHU ROOM, FENCING, RETAINING WALL & REACTOR OIL SUMP LOCATION UPDATED	S.G.K.	P.K.S.	G.M.S.
R1	05.09.2025	FOR REVIEW AND APPROVAL	N.H.K.	G.M.S.	G.M.S.
RO	02.07.2025	FOR REVIEW AND APPROVAL	R.N	G.M.S.	G.M.S.

CLIENT : MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD.  
PLOT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA-KURLA COMPLEX  
BANDRA (E) MUMBAI - 400 051

PROJECT : ESTABLISHMENT OF 400/220kV GIS SUBSTATION ALONGWITH ASSOCIATED TRANSMISSION LINE AT-SAROLE KHURD (PIMPALGAON) TAL-NIPHAD, DIST. NASHIK UNDER NASHIK ZONE AGAINST TURNKEY CONTRACT

LOA NO. : MSETCL/CO/Projects/PRE-Tender/T-2412/07271 Dated 15.10.2024

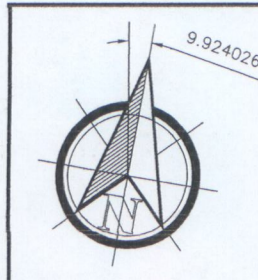
stelmec STELMEC LIMITED  
beyond boundaries MUMBAI

TITLE : ELECTRICAL LAYOUT PLAN DRAWING FOR 400/220kV GIS PIMPALGAON SUBSTATION

SCALE : 1:300

NAME	SIGN	DATE
DRAWN	S.G.K.	02.07.2025
CHECKED	P.K.S.	02.07.2025
APPROVED	G.M.S.	02.07.2025

DRG. NO. : ELP/PRJ30/PG/002  
SHEET NO. : 1 OF 2



**BOQ 400kV EQUIPMENTS :**

SR NO.	ITEM DESCRIPTION	LEGENDS	QTY.
01	400kV, 3150A, 63kA/3sec, 3-PHASE GIS LINE BAY WITH CSD - 3000-1500-750/1A (5C)	-	04 SET
02	400kV, 3150A, 63kA/3sec, 3-PHASE GIS ICT BAY WITH CSD - 3000-1500-750/1A (5C)	-	02 SET
03	400kV, 3150A, 63kA/3sec, 1-PHASE GIS SPARE ICT BAY WITHOUT CSD - 3000-1500-750/1A (5C)	-	01 SET
04	400kV, 3150A, 63kA/3sec, 3-PHASE GIS BUS REACTOR BAY WITH CSD - 3000-1500-750/1A (5C)	-	01 SET
05	400kV, 3150A, 63kA/3sec, 3-PHASE GIS BUS COUPLER BAY WITHOUT CSD - 4000-2000-1000/1A (5C)	-	01 SET
06	400kV, 4000A, 63kA-3 SEC, 3-PHASE GIS MAIN BUSBAR WITH PT BAY (3C). $\frac{400kV}{\sqrt{3}} / \frac{110V}{\sqrt{3}}$	-	02 SET
07	400kV, 4000A, 63kA-3 SEC, 1-PHASE GIS AUXILIARY BUSBAR	-	01 SET
08	400kV, 3150A, 63kA-3 SEC, 1-PHASE SF6 TO AIR INSULATED POLYMER BUSHING	-	22 SET
09	400kV, 3150A, 50kA/3sec, 3-PHASE C2-M2 CLASS CIRCUIT BREAKER WITH CSD		02 SET
10	400kV, 3150A, 63kA/3sec, 3-PHASE, HCB ISOLATOR WITH 1 E/S		02 SET
11	390kV, 10kA, CLASS III LIGHTNING ARRESTER (1-PH) PORCELAIN TYPE - 10500MM CR.		12 Nos.
12	390kV, 10kA, CLASS III LIGHTNING ARRESTER (1-PH) POLYMER TYPE - 10500MM CR.		16 SET
13	SUPPORT INSULATORS 8KN ALONG WITH GRADING RING (1-PH)		04 Nos.
14	SUPPORT INSULATORS 8KN ALONG WITH GRADING RING (1-PH) FOR WT	-	24 Nos.
15	167MVA, 400/220/33kV, 1-PH ICT		07 Nos.
16	125MVAR, 400kV, 3-PH BUS REACTOR		01 Nos.
17	80MVAR, 400kV, 3-PH LINE REACTOR		02 Nos.
18	400kV, 3150A/1mH, 1-PH PEDESTAL TYPE WAVE TRAP		08 Nos.
19	120kV LIGHTNING ARRESTER POLYMER (1-PH)		01 No.
20	400kV, CAPACITIVE VOLTAGE TRANSFORMER (1-PH) 4400pF $\frac{400kV}{\sqrt{3}} / \frac{110V}{\sqrt{3}} / \frac{110V}{\sqrt{3}} / \frac{110V}{\sqrt{3}}$		12 Nos.
21	NEUTRAL GROUNDING RESISTOR		02 Nos.

**BOQ 220kV EQUIPMENTS :**

SR NO.	ITEM DESCRIPTION	LEGENDS	QTY.
01	245kV, 2000A, 50kA-3 SEC, 3-PHASE GIS LINE BAY - 2000-1000/1A (5C)	-	04 SET
02	245kV, 2000A, 50kA-3 SEC, 3-PHASE GIS ICT BAY - 1600-800/1A (5C)	-	02 SET
03	245kV, 2000A, 50kA-3 SEC, 3-PHASE GIS BUS COUPLER BAY - 2400-1200/1A (5C)	-	01 SET
04	245kV, 3150A, 50kA-3 SEC, 3-PHASE GIS MAIN BUSBAR WITH PT BAY, 3C. $\frac{220kV}{\sqrt{3}} / \frac{110V}{\sqrt{3}}$	-	02 SET
05	245kV, 3150A, 50kA-3 SEC, 1-PHASE GIS AUXILIARY BUSBAR	-	01 SET
06	245kV, 2000A, 50kA-3 SEC, 1-PHASE SF6 TO AIR INSULATED POLYMER BUSHING	-	19 SET
07	198kV STATION CLASS, LONG DURATION DISCHARGE CLASS 3, PRESSURE RELEIF CLASS A, LINE DISCHARGE CURRENT 10kA, SURGE ARRESTER (PORCELAIN TYPE)		12 Nos.
08	198kV STATION CLASS, LONG DURATION DISCHARGE CLASS 3, PRESSURE RELEIF CLASS A, LINE DISCHARGE CURRENT 10kA, SURGE ARRESTER (POLYMER TYPE)		7 Nos.
09	245kV, 6KN, BPI FOR CONDUCTOR SUPPORT (FOR WT) (FOR ANY TWO PHASES)	-	24 Nos.
10	220kV, 1250A/0.5mH, 1-PH PEDESTAL TYPE WAVE TRAP		08 Nos.
11	220kV, 6600pF, 1-PH COUPLING CAPACITOR (FOR ANY TWO PHASES)		08 Nos.

**BOQ 33kV EQUIPMENTS FOR ICT TERTIARY ARRANGEMENT:**

SR NO.	ITEM DESCRIPTION	LEGENDS	QTY.
01	36kV NCT, 2000/1A, 2C		3 Nos.
02	54kV, 10kA, STATION CLASS, SURGE ARRESTER (POLYMER) (1-PH)		6 Nos.
03	39kV, 10kA, STATION CLASS, SURGE ARRESTER (POLYMER) (1-PH)		6 Nos.
04	33kV POTENTIAL TRANSFORMER		6 Nos.
05	33kV BUS POST INSULATOR		60 Nos.
06	36kV ISOLATOR WITHOUT EARTHING BLADE 800A, 25KA, 3 SEC. (3-PH)		2 SET

**BOQ 33kV EQUIPMENTS FOR STATION TRAFU YARD :**

SR NO.	ITEM DESCRIPTION	LEGENDS	QTY.
01	33kV/433V, 500kVA, DY11, STATION TRANSFORMER, Z=5%		2 Nos.
02	36kV ISOLATOR WITHOUT EARTHING BLADE 800A, 25KA, 3 SEC. (3-PH)		5 SET
03	36kV HORN GAP FUSE (3-PH), 10A		2 SET
04	30kV, 10kA, STATION CLASS, SURGE ARRESTER (PORCELAIN (1-PH.))		6 Nos.
05	33kV METERING CURRENT TRANSFORMER		6 Nos.
06	33kV METERING POTENTIAL TRANSFORMER		6 Nos.

**SYSTEM PARAMETER :**

SR NO.	DESCRIPTION OF PARAMETER	SYSTEM VOLTAGE			
		400kV	220kV	33kV	ICT TERTIARY SYSTEM
01	SYSTEM OPERATING VOLTAGE	400kV	220kV	33kV	33kV
02	MAXIMUM SYSTEM VOLTAGE	420kV	245kV	36kV	52kV
03	RATED FREQUENCY	50Hz	50Hz	50Hz	50Hz
04	NO. OF PHASES	3	3	3	3
05	FULL WAVE IMPULSE WITHSTAND VOLTAGE (1.2/50 MICRO SEC.)	1425kVP	1050kVP	170kVP	170kVP
06	ONE MINUTE POWER FREQUENCY DRY & WET WISTAND VOLTAGE (rms)	630kV	460kV	70kV	70kV
07	CORONA EXTINCTION VOLTAGE	320kV	156kV	N/A	N/A
08	MAX. RADIO INTERFERENCE VOLTAGE FOR FREQUENCY BETWEEN 0.5MHz & 2MHz AT 320kV RMS FOR 400kV SYSTEM & 156kV RMS FOR 220kV SYSTEM	1000 microV	1000 microV	N/A	N/A
09	MINIMUM CREEPAGE DISTANCE	25mm/kV (10500mm)	25mm/kV (6125mm)	25mm/kV (900mm)	25mm/kV (900mm)
10	RATED SHORT CIRCUIT CURRENT FOR 3 SEC. DURATION	63kA	50kA	31.5kA	31.5kA
11	SYSTEM NEUTRAL EARTHING	SOLIDLY EARTH	SOLIDLY EARTH	SOLIDLY EARTH	UN-EARTH

SR NO.	DESCRIPTION OF PARAMETER	SYSTEM VOLTAGE			
		400kV	220kV	33kV	ICT TERTIARY SYSTEM
12	MINIMUM CLEARANCE				
i	PHASE TO PHASE	4200mm	2100mm	320mm	320mm
ii	PHASE TO EARTH	3500mm	2100mm	320mm	320mm
iii	SAFETY CLEARANCE	6500mm	4300mm	3000mm	3000mm
iv	GROUND CLEARANCE	8200mm	6500mm	3700mm	3700mm
13	INSULATOR				
a)	TENSION DISC INSULATOR	160KN	120KN	120KN	N/A
b)	SUSPENSION DISC INSULATOR	120KN	70KN	70KN	N/A
c)	BPI FOR CONDUCTOR SUPPORT	8KN	6KN	4KN	4KN
d)	BPI FOR ISOLATOR	8KN	4KN	4KN	4KN
e)	BPI FOR WAVE TRAP	8KN	4KN	N/A	N/A
14	NO. OF DISC INSULATOR				
a)	TENSION STRING HARDWARE	24 Nos.	15 Nos.	4 Nos.	N/A
b)	SUSPENSION DISC INSULATOR	23 Nos.	14 Nos.	N/A	N/A

**400kV CONDUCTOR & STRINGING DETAILS :**

DESCRIPTION	CONDUCTOR CONFIGURATION	INSULATOR STRING/PHASE
EQUIPMENT CONNECTION FOR LINES, ICT & REACTORS	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 450mm SUB-CONDUCTOR SPACING	DOUBLE TENSION 160KN DISC
DROPPERS FOR LINES, ICT & REACTORS	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 450mm SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 120KN DISC
EARTHWIRE	7/3.66mm G.I. WIRE (10.98mm DIA)	N/A

**220kV CONDUCTOR & STRINGING DETAILS :**

DESCRIPTION	CONDUCTOR CONFIGURATION	INSULATOR STRING/PHASE
EQUIPMENT CONNECTION FOR LINES	SINGLE AAAC 640 MORCULLA CONDUCTOR	SINGLE TENSION 120KN DISC
EQUIPMENT CONNECTION ICT	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 350mm SUB-CONDUCTOR SPACING	SINGLE TENSION 120KN DISC
FLYOVER BUS FOR ICT INTERCONNECTION	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 350mm SUB-CONDUCTOR SPACING	DOUBLE TENSION 120KN DISC
DROPPERS FOR LINES	SINGLE AAAC 640 MORCULLA CONDUCTOR	SINGLE SUSPENSION 70KN DISC
DROPPERS FOR ICT	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 350mm SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 70KN DISC
EARTHWIRE	7/3.66mm G.I. WIRE (10.98mm DIA)	N/A

**33kV STN. TRAFU YARD CONDUCTOR & STRINGING DETAILS :**

DESCRIPTION	CONDUCTOR CONFIGURATION	INSULATOR STRING/PHASE
MAIN BUS	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 140mm SUB-CONDUCTOR SPACING	SINGLE TENSION 120KN DISC
EQUIPMENTS INTERCONNECTION	SINGLE AAAC MORCULLA CONDUCTOR	N/A
EARTHWIRE	7/3.66mm G.I. WIRE (10.98mm DIA)	N/A

**BOM 220kV STRUCTURE :**

TOWER WITH PEAK		BEAM	
TYPE	QTY. IN Nos.	TYPE	QTY. IN Nos.
AG+AP	05	AB	04
T1 (ON ICT SIDE)	04	B1MS	02
		B2	01

**BOM 400kV STRUCTURE :**

TOWER WITH PEAK		BEAM	
TYPE	QTY. IN Nos.	TYPE	QTY. IN Nos.
T1	10	B2	02
T3	06	B1MS	06
T5	03	B3	06

**BOM 33kV STRUCTURE :**

TOWER WITH PEAK		BEAM	
TYPE	QTY. IN Nos.	TYPE	QTY. IN Nos.
HH+HP	06	HA	03

This approval does not absolve you from your responsibility in supplying material as per M.S.E.T.C. specifications and relevant standards requirements.

**APPROVED**

Executive Engineer (D&E-S2)  
Design Department  
M.S.E.T.C., "Prakashganga"  
BKC, Bandra (East), Mumbai-51

VERIFIED BY:

CHECKED BY:



REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R2	24.09.2025	33kV YARD, AHU ROOM, FENCING, RETAINING WALL & REACTOR OIL SUMP LOCATION UPDATED.	S.G.K.	P.K.S	G.M.S
R1	05.09.2025	FOR REVIEW AND APPROVAL	N.H.K	G.M.S	G.M.S
R0	02.07.2025	FOR REVIEW AND APPROVAL	R.N	G.M.S	G.M.S

CLIENT :	MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD. PLOT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA-KURLA COMPLEX BANDRA (E) MUMBAI - 400 051
PROJECT :	ESTABLISHMENT OF 400/220kV GIS SUBSTATION ALONGWITH ASSOCIATED TRANSMISSION LINE AT-SAROLE KHURD (PIMPALGAON) TAL-NIPHAD, DIST. NASHIK UNDER NASHIK ZONE AGAINST TURNKEY CONTRACT
LOA NO. :	MSETCL/CO/Projects/PRE-Tender/T-2412/07271 Dated 15.10.2024

NAME	SIGN	DATE
DRAWN	S.G.K.	02.07.2025
CHECKED	P.K.S	02.07.2025
APPROVED	G.M.S	02.07.2025

DRG. NO. :	ELP/PRJ30/PG/002	REV.	R2
SHEET NO. :	2 OF 2		

SCALE :	11:300
TITLE :	ELECTRICAL LAYOUT PLAN DRAWING FOR 400/220kV GIS PIMPALGAON SUBSTATION