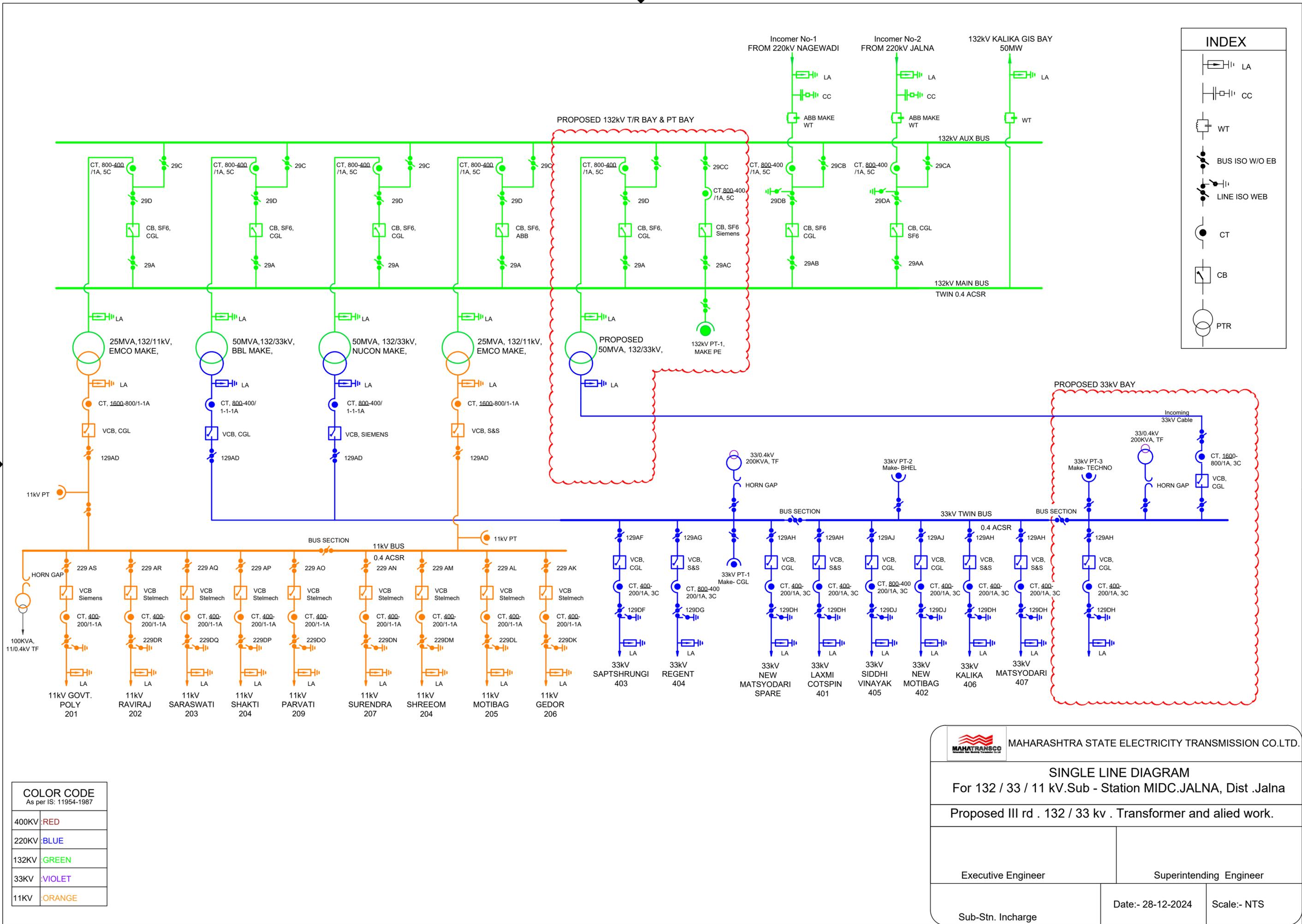


Substation Drawings for Jalna MIDC

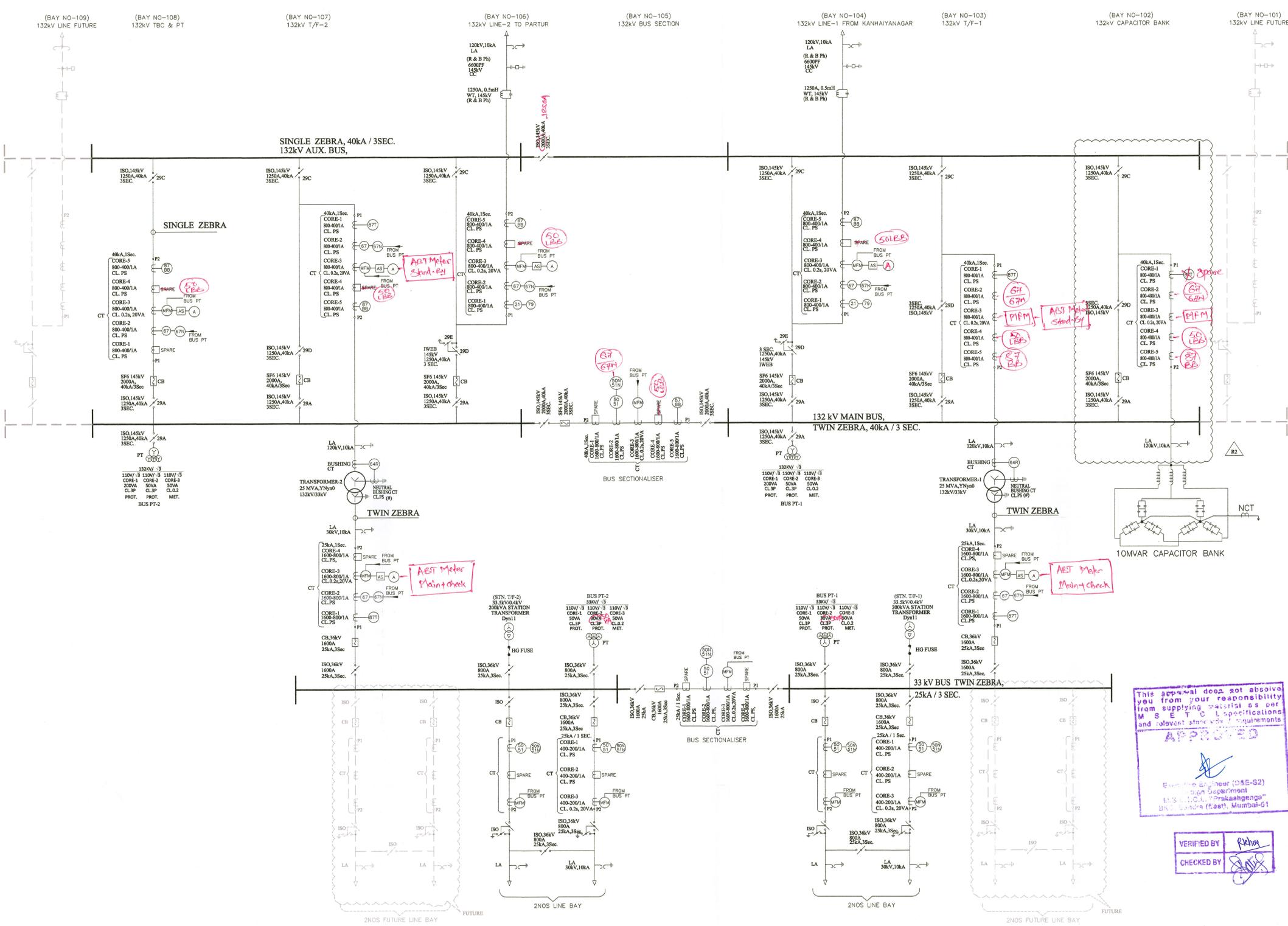


INDEX	
	LA
	CC
	WT
	BUS ISO W/O EB
	LINE ISO WEB
	CT
	CB
	PTR

COLOR CODE	
As per IS: 11954-1987	
400KV	RED
220KV	BLUE
132KV	GREEN
33KV	VIOLET
11KV	ORANGE

MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.	
SINGLE LINE DIAGRAM For 132 / 33 / 11 kV.Sub - Station MIDC.JALNA, Dist .Jalna	
Proposed III rd . 132 / 33 kv . Transformer and allied work.	
Executive Engineer	Superintending Engineer
Sub-Stn. Incharge	Date:- 28-12-2024 Scale:- NTS

Substation Drawings for 132 kV Utwad



S.NO.	EQUIPMENT	DESCRIPTION	QUANTITY
1.	CIRCUIT BREAKER	2000A, 40kA/SEC, 3P	9 (3) Set.
2.	ISOLATOR	1250A, WITH EARTH SWITCH	2 Set.
		2000A, WITHOUT EARTH SWITCH	2 (3) Set.
		1250A, WITHOUT EARTH SWITCH	18 Set.
3.	CURRENT TRANSFORMER	1600-800/1A, 5 CORE	18 Nos.
		800-400/1A, 5 CORE	21 Nos.
4.	WAVE TRAP	1250A, 0.5mH	4 Nos.
5.	COUPLING CAPACITOR	6600PF 145kV	4 Nos.
6.	LIGHTNING ARRESTOR (PORCELAIN)	120kV,10kA	9 Nos.
7.	LIGHTNING ARRESTOR (POLYMER)	120kV,10kA	6 Nos.
8.	POTENTIAL TRANSFORMER	132kV/√3	6 Nos.
9.	POWER TRANSFORMER	132kV/33kV,25 MVA	2 Nos.
10.	CAPACITOR BANK	10MVAR	1 Nos.
11.	NEUTRAL CURRENT TRANSFORMER	-	1 Nos.

S.NO.	EQUIPMENT	DESCRIPTION	QUANTITY
1.	CIRCUIT BREAKER	1600A, 25kA/3Sec	7 Set.
2.	ISOLATOR	800A, WITH EARTH SWITCH	4 Set.
		1600A, WITHOUT EARTH SWITCH	4 Set.
		800A, WITHOUT EARTH SWITCH	10 Set.
3.	CURRENT TRANSFORMER	1600-800/1A, 4 CORE	9 Nos.
		400-200/1A, 3 CORE	12 Nos.
4.	HORN GAP FUSE	-	2 Set.
5.	STATION TRANSFORMER	33kV/433V, 200kVA,DY11, Z=5%	2 Nos.
6.	LIGHTNING ARRESTOR	30kV,10kA	30 Nos.
7.	POTENTIAL TRANSFORMER	-	6 Nos.

Application	Core No.	Ratio	Output (VA)	Accuracy Class	Vk	Isf.
Distance prot. for line	1	800-400/1A	-	PS	40(Rec+96)	-
Differential Prot. for Trfn.	2	800-400/1A	-	PS	30(Rec+96)	-
Spare for BT bay	3	800-400/1A	20	0.2s	40(Rec+97)	<5
Metering for all	4	800-400/1A	-	PS	40(Rec+97)	-
Spare for all	5	800-400/1A	-	PS	40(Rec+97)	-

Application	Core No.	Ratio	Output (VA)	Accuracy Class	Vk	Isf.
Spare	1	1600-800/1A	-	PS	40(Rec+96)	-
Non-Dir. O/C + E/F (50, 51N)	2	1600-800/1A	-	PS	30(Rec+96)	-
Metering	3	1600-800/1A	20	0.2s	40(Rec+97)	<5
Spare	4	1600-800/1A	-	PS	40(Rec+97)	-
Bubar Protection (87B8) for all	5	1600-800/1A	-	PS	40(Rec+97)	-

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

APPROVED

Engineer (D&E-S2)
 Design Department
 B.S. Ramnagar (Kash, Mumbai-61)

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

21	DISTANCE PROTECTION RELAY
79	AUTO RECLOSURE RELAY
67N	DIRECTIONAL PHASE O/C PROTECTION RELAY
67N	DIRECTIONAL GROUND O/C PROTECTION RELAY
50	INST. PHASE O/C PROTECTION RELAY
51	IDMT. E/F PROTECTION RELAY
50N	INST. O/C PROTECTION RELAY
51N	IDMT. E/F PROTECTION RELAY
50LB	LOCAL BKR. BACKUP PROTECTION RELAY
87T	T/F DIFFERENTIAL PROTECTION RELAY
87BB	BUSBAR DIFFERENTIAL PROTECTION RELAY
64R	RESTRICTED E/F RELAY
MFM	MULTIFUNCTIONAL METER

S.NO.	LEGENDS	DESCRIPTION
1.	[Symbol]	POWER TRANSFORMER
2.	[Symbol]	STATION TRANSFORMER
3.	[Symbol]	CIRCUIT BREAKER
4.	[Symbol]	COUPLING CAPACITOR
5.	[Symbol]	WAVE TRAP
6.	[Symbol]	LIGHTNING ARRESTOR

S.NO.	LEGENDS	DESCRIPTION
7.	[Symbol]	ISOLTAOR
8.	[Symbol]	ISOLTAOR WITH ONE EARTH SWITCH
9.	[Symbol]	CURRENT TRANSFORMER
10.	[Symbol]	HORN GAP FUSE
11.	[Symbol]	POTENTIAL TRANSFORMER
12.	[Symbol]	CAPACITOR BANK

LEGEND:
 ——— PRESENT SCOPE
 - - - - - FUTURE/EXISTING
 (#) SPECIFICATION FOR NEUTRAL CT WILL AS PER MANUFACTURE STATNDEN.

Application	Core No.	Primary Voltage (V)	Secondary Voltage (V)	Output (VA)	Accuracy Class
Protection - 1	1	132kV/√3	110V/√3	200	3P
Protection - 2	2	132kV/√3	110V/√3	50	3P
Metering	3	132kV/√3	110V/√3	50	0.2

Application	Core No.	Ratio	Output (VA)	Accuracy Class	Vk	Isf.
Transformer Differential	1	1600-800/1A	-	PS	40(Rec+96)	-
Dir. O/C+E/F for Incoming	2	1600-800/1A	-	PS	30(Rec+96)	-
Non-Dir. O/C+E/F for Bus section	3	1600-800/1A	20	0.2s	40(Rec+97)	<5
Metering for all	4	1600-800/1A	-	PS	40(Rec+96)	-
Spare for all	5	1600-800/1A	-	PS	40(Rec+96)	-

Application	Core No.	Ratio	Output (VA)	Accuracy Class	Vk	Isf.
Non-Dir. O/C + E/F (50/51N)	1	400-200/1A	-	PS	40(Rec+96)	-
Spare for all	2	400-200/1A	-	PS	40(Rec+96)	-
Metering for all	3	400-200/1A	20	0.2s	40(Rec+97)	<5

Application	Core No.	Primary Voltage (V)	Secondary Voltage (V)	Output (VA)	Accuracy Class
Protection - 1	1	33kV/√3	110V/√3	50	3P
Protection - 2	2	33kV/√3	110V/√3	50	3P
Metering	3	33kV/√3	110V/√3	50	0.2

REV. NO.	DESCRIPTION	DRAWN	CHKD.	APPD.	DATE
R3	ISSUED FOR APPROVAL	KB	TSS	TEC	14/07/2021
R2	ISSUED FOR APPROVAL	KB	TSS	TEC	08/07/2021
R1	ISSUED FOR APPROVAL	KB	TSS	TEC	26/06/2021
R0	ISSUED FOR APPROVAL	KB	TSS	TEC	04/06/2021

CUSTOMER: MAHARASHTRA STATE ELECTRICITY TRANSMISSION Co. Ltd., ISO 9001-2000 certified

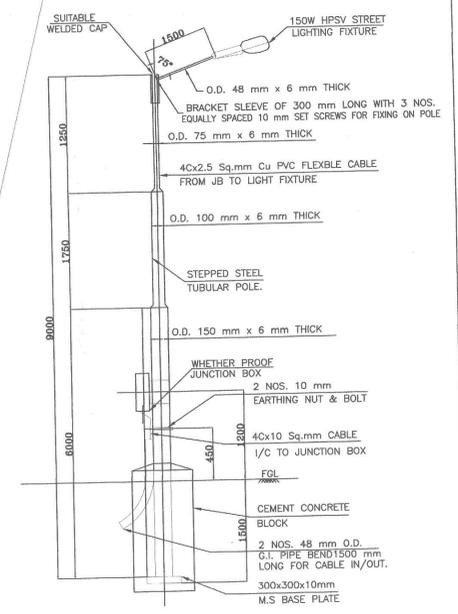
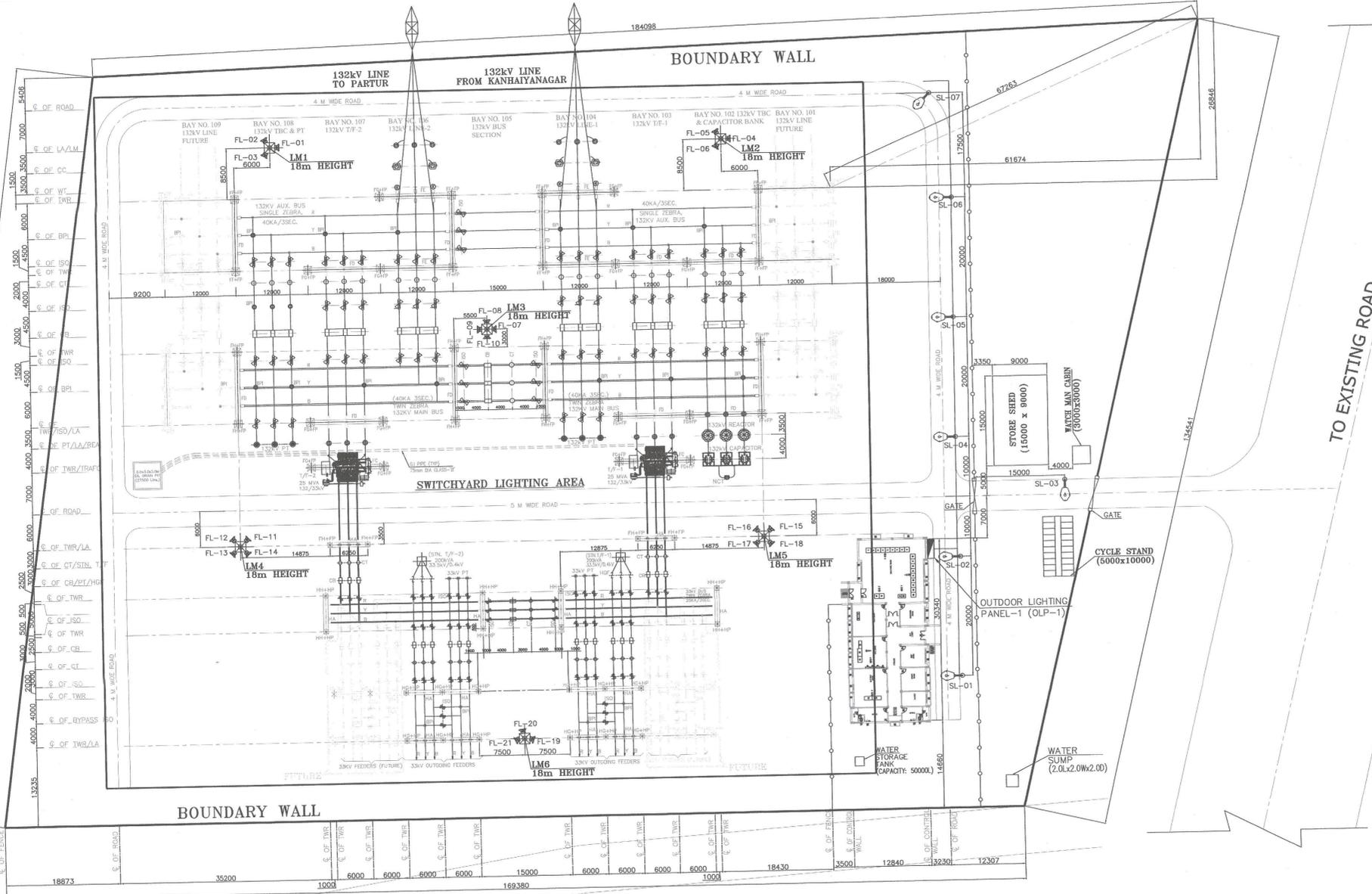
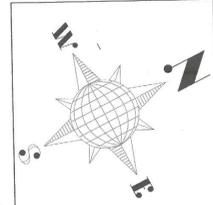
CONTRACTOR: TESLA TRANSFORMERS INDIA LTD, 23A, Sector-B, Industrial Area, Govindpura, Bhopal-462023, MP

PROJECT: ESTABLISHMENT OF 132/33kV NER (SB01) RAMNAGAR SUBSTATION AT UTWAD, DIST. JALNA ALONG-WITH ASSOCIATED TRANSMISSION LINES UNDER AURANGABAD ZONE

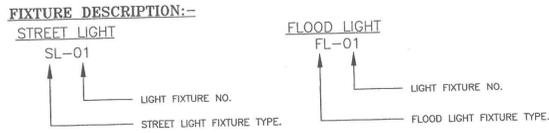
TITLE: 132/33kV SINGLE LINE DIAGRAM

DRAWN: MSB DATE: 04/06/2021
 CHECKED: TSS SCALE: NTS
 APPROVED: TEC SIZE: A1 SHEET No. 01 OF 01
 PASSED: TEC REV. R3

DRG. No. TSL-MHA-SB01-ELB-003

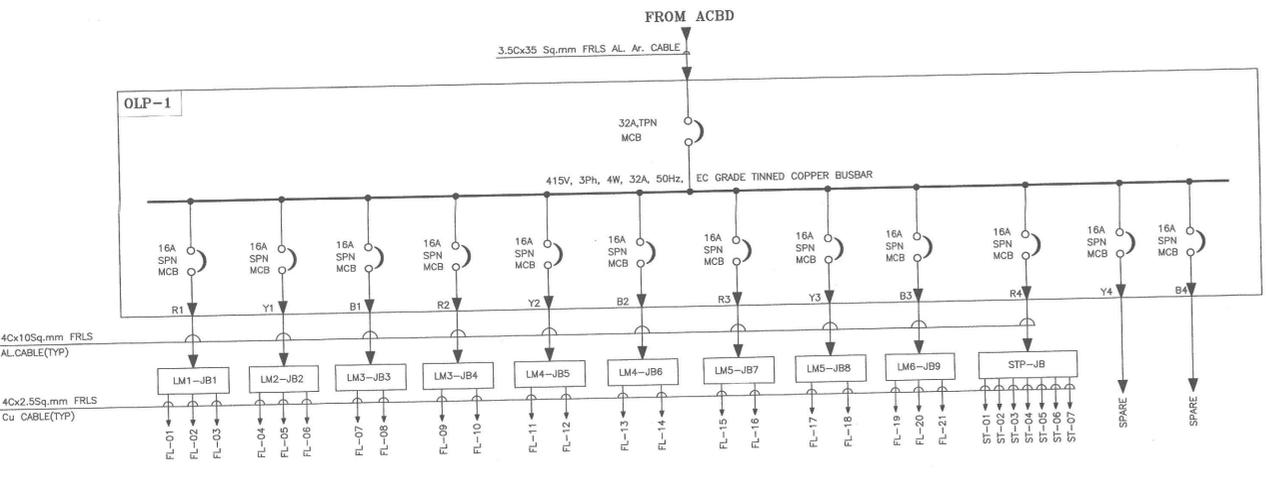


- NOTES:-**
- ALL DIMENSIONS ARE IN MM.
 - LOCATION, FIXTURE TYPE, MOUNTING HEIGHT AND CIRCUIT NO FOR EACH FIXTURE ARE INDICATED IN THE LAYOUT PLAN.
 - MOUNTING HEIGHTS OF LIGHTING ACCESSORIES AND PANELS SHALL BE AS FOLLOWS (FROM FGL):
 OLP - 1200mm TO BOTTOM OF THE PANEL
 LIGHT FIXTURE IN LM - 18300mm
 STREET LIGHTING FIXTURE AT POLE - 7500mm
 JUNCTION BOX - 1200mm
 - LIGHTING WIRING DETAILS:
 OLP TO JUNCTION BOX - 4Cx10 Sq.mm AL CABLE
 JUNCTION BOX TO STREET LIGHTING - 4Cx2.5 Sq.mm Cu CABLE
 JUNCTION BOX TO FLOOD LIGHTING - 4Cx2.5 Sq.mm Cu CABLE
 - EACH LIGHTING FIXTURE SHALL BE PROVIDED WITH AN EARTHING TERMINAL.
 - MAKE OF LIGHTING FIXTURES SHALL BE CROMPTON GREAVES OR BAJAJ OR PHILIPS.
 - OUTDOOR LIGHTING PANEL AND JUNCTION BOXES SHALL BE WEATHER PROOF TYPE WITH IP-55 DEGREE OF PROTECTION.



LEGEND:
 ——— PRESENT SCOPE.
 - - - - - FUTURE/EXISTING.

132/33KV SWITCHYARD LIGHTING PLAN



BILL OF MATERIALS:-

S.NO	LEGEND	DESCRIPTION	TYPE	QTY
1.		2x40W, HPSV, WEATHER PROOF HEAVY DUTY WIDE REFLECTOR IND. FLOOD LIGHT LUMINAIRES.	FL	21 Nos
2.		1x150W, HPSV FIXTURE FOR STREET LIGHTING	SL	07 Nos
3.		OUTDOOR LIGHTING PANEL	OLP	01 No
4.	-	JUNCTION BOX (OUTDOOR TYPE).	JB	09 Nos
5.	-	9M STREET LIGHTING POLE WITH JUNCTION BOX	-	07 Nos
6.	-	4Cx10Sq.mm AL CABLE	-	1200 Mtrs
7.	-	4Cx2.5Sq.mm Cu CABLE	-	300 Mtrs

REFERENCE DRAWINGS/DOCUMENTS:-

S.No	TITLE	DRAWING No	REV
1.	132/33KV SWITCHYARD EQUIPMENT PLAN LAYOUT	TSL-MHA-SEOLI-ELE-001	3
2.	132/33KV SWITCHYARD LIGHTING CALCULATION	TSL-MHA-SEOLI-ELE-032	0

Executive Engineer
 EHV Projects Division
 Aurangabad

Superintending Engineer
 EHV Projects Circle
 Aurangabad

CUSTOMER: MAHARASHTRA STATE ELECTRICITY TRANSMISSION Co. Ltd., ISO 9001-2000 certified

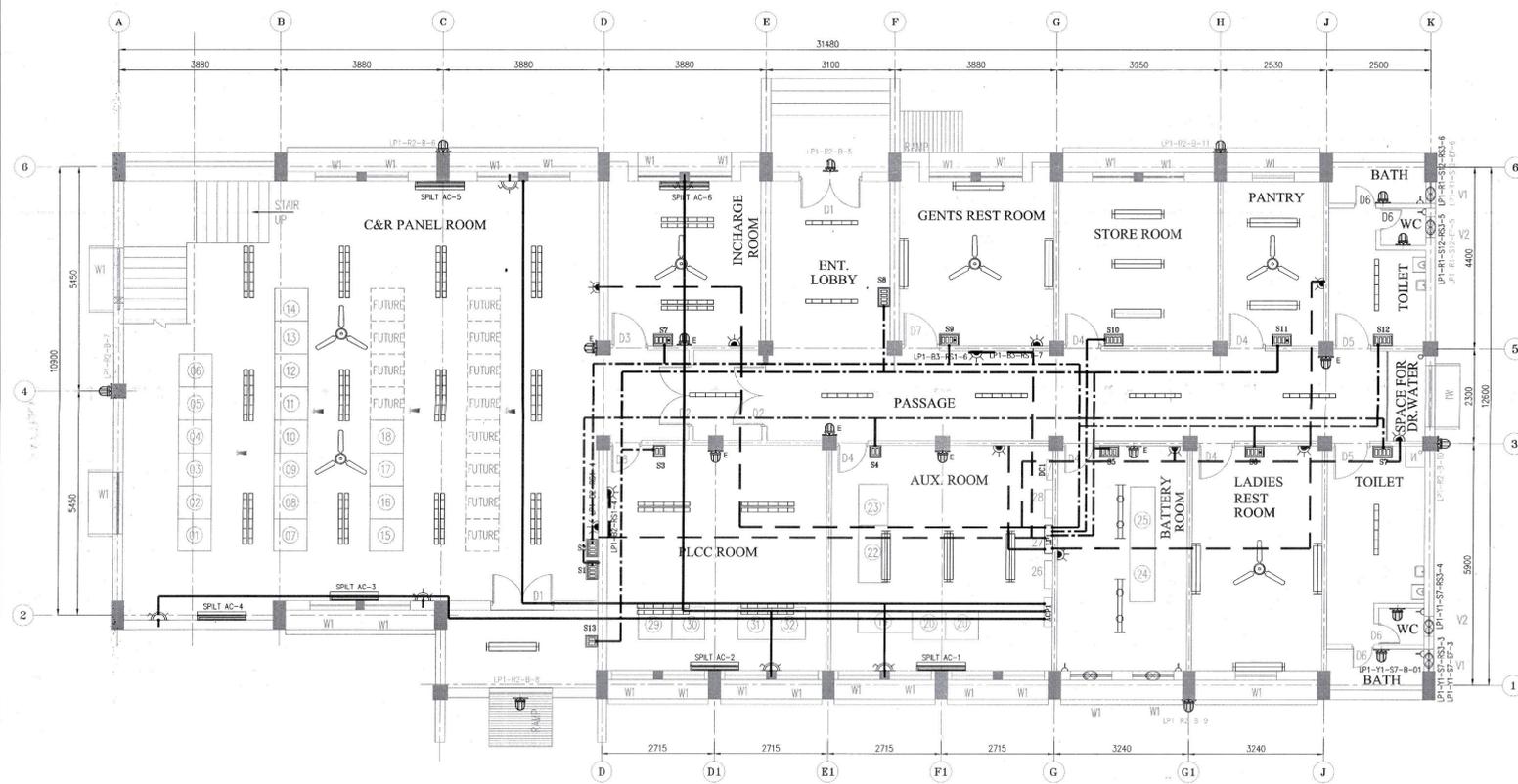
CONTRACTOR: TESLA TRANSFORMERS INDIA LTD
 23A, Sector-B, Industrial Area, Govindpura, Bhopal-462023, MP

PROJECT: ESTABLISHMENT OF 132/33kV NER (SEOLI) RAMNAGAR SUBSTATION AT UTWAD, DIST: JALNA ALONG WITH ASSOCIATED TRANSMISSION LINES UNDER AURANGABAD ZONE

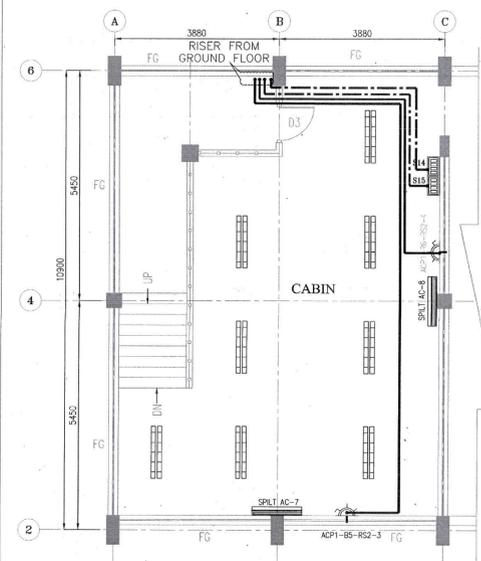
TITLE: 132/33KV SWITCHYARD LIGHTING LAYOUT

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CHECKED	TSS	SCALE: 1:4000	
APPROVED	TEC	SIZE: A1	SHEET No. 1 OF 1
REV. NO.	DESCRIPTION	DRAWN/CHKD. APPD.	DATE

DRG. No. TSL-MHA-SEOLI-ELE-005



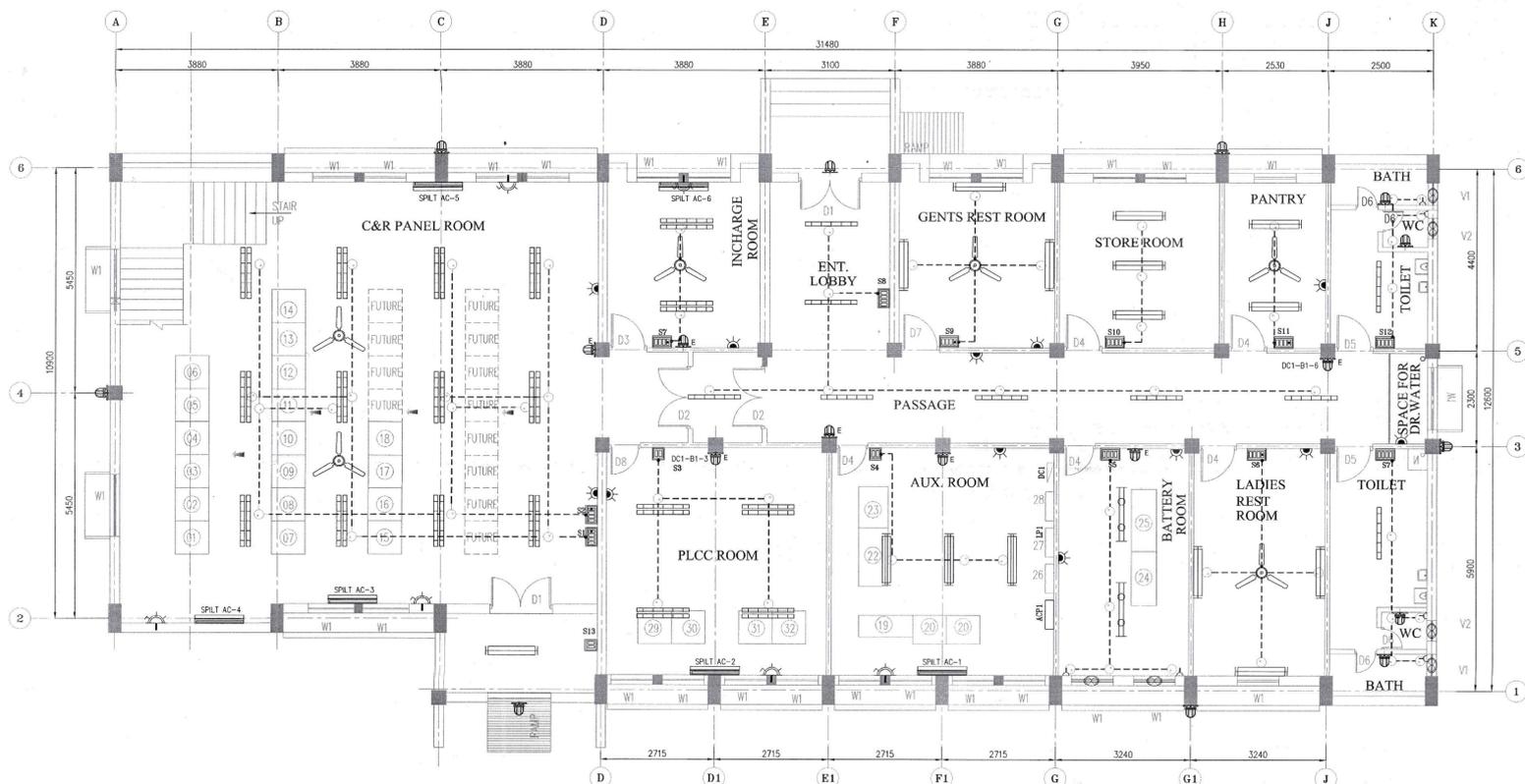
CONTROL ROOM GROUND FLOOR CONDUIT PLAN
(CONDUIT FROM LDB TO SWITCHBOARD & AC SOCKET)



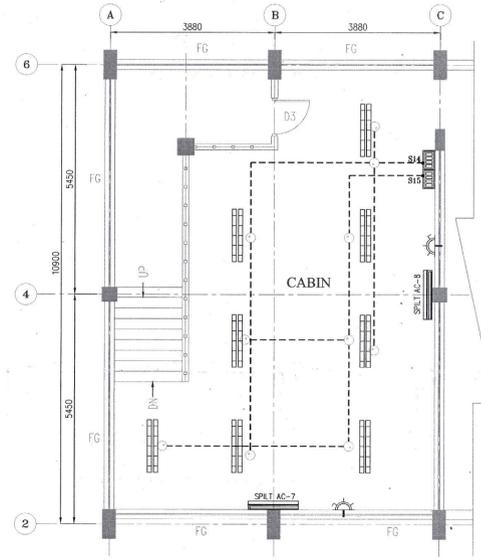
CONTROL ROOM FIRST FLOOR CONDUIT PLAN

- LEGEND:-**
- LDB TO SWITCH BOX (20mm CONDUIT)
 - LDB TO POWER SOCKET (25mm CONDUIT)
 - LDB TO AC POWER SOCKET (25mm CONDUIT)
 - SWITCH BOX TO FIXTURES (20mm CONDUIT)

S.NO.	SWD NO	SWD TYPE	10A SWITCH	REGULATOR
01.	S1	SWD-2	3	1
02.	S2	SWD-2	3	1
03.	S3	SWD-1	2	-
04.	S4	SWD-1	2	-
05.	S5	SWD-3	2	-
06.	S6	SWD-2	3	1
07.	S7	SWD-3	3	1
08.	S8	SWD-2	3	1
09.	S9	SWD-2	3	1
10.	S10	SWD-3	4	-
11.	S11	SWD-2	3	1
12.	S12	SWD-3	4	-
13.	S13	SWD-1	2	-
14.	S14	SWD-3	4	-
15.	S15	SWD-3	4	-
16.	S16	SWD-3	4	-



CONTROL ROOM GROUND FLOOR CONDUIT PLAN
(CONDUIT FROM SWITCHBOARD TO FIXTURES)



CONTROL ROOM FIRST FLOOR CONDUIT PLAN

S.NO.	S.NO.	DESCRIPTION	QTY.
01.	-	25mm DIA PVC CONDUIT	400 Mts.
02.	-	20mm DIA PVC CONDUIT	300 Mts.
03.	⊙	4 WAY PULL BOX	05 Nos.
04.	⊙	3 WAY PULL BOX	15 Nos.
05.	⊙	2 WAY ANGLE PULL BOX	10 Nos.
06.	⊙	2 WAY PULL BOX	20 Nos.
07.	⊙	1 WAY PULL BOX	40 Nos.

Always
Executive Engineer
EHV Projects Circle
MSEFCL, Aurangabad.

Supervising Engineer
EHV Projects Circle
MSEFCL, Aurangabad

RO	ISSUED FOR APPROVAL	KB	TSS	TEC	02/07/2022
REV. NO.	DESCRIPTION	DRAWN	CHKD.	APPD.	DATE

CUSTOMER: MAHARASHTRA STATE ELECTRICITY TRANSMISSION Co. Ltd., ISO 9001-2000 certified

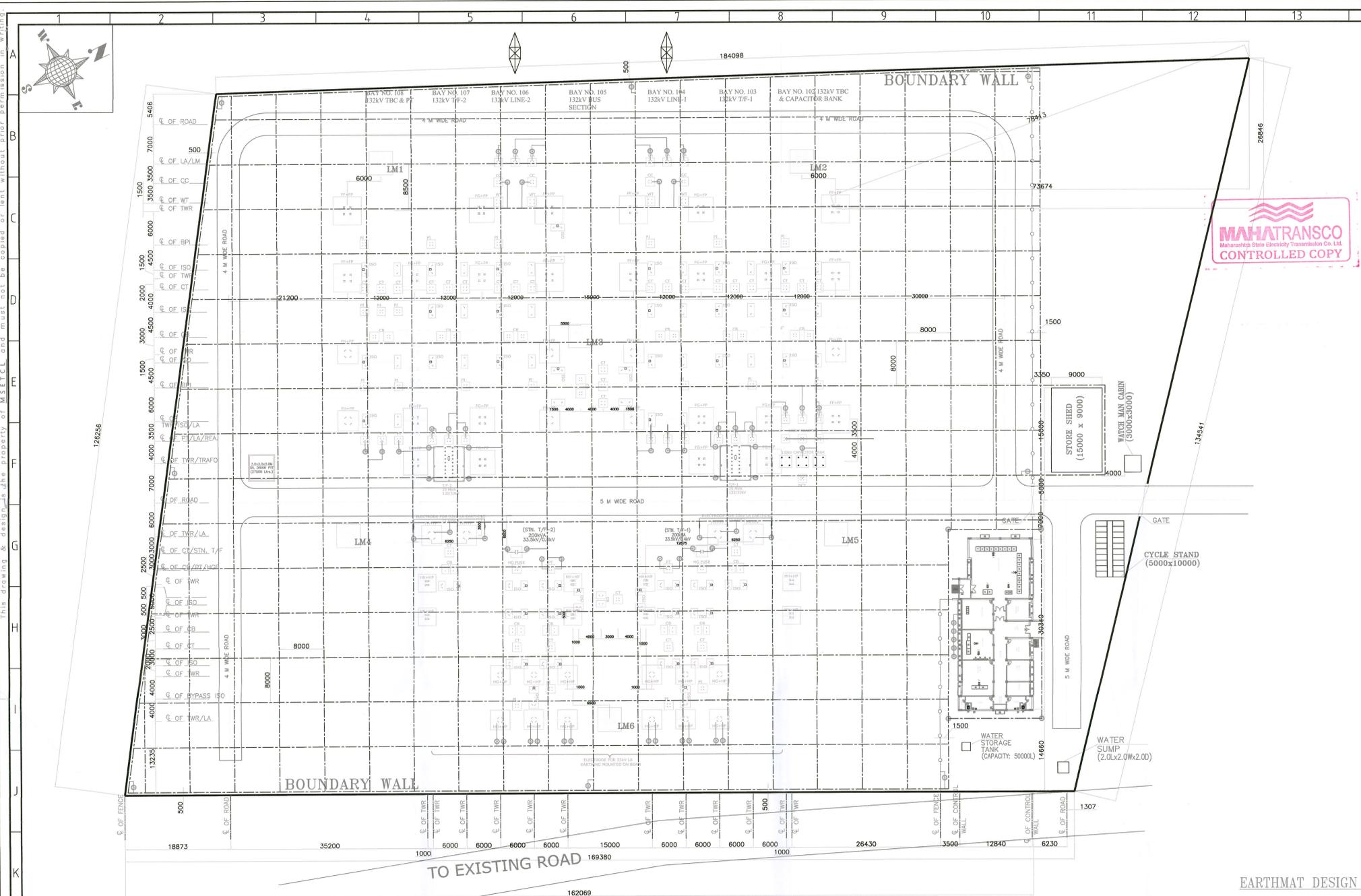
CONTRACTOR: TESLA TRANSFORMERS INDIA LTD
23A, Sector-5, Industrial Area, Govindpura, Bhopal-462023, MP

PROJECT: ESTABLISHMENT OF 132/33kV NER (SEOLI) RAMNAGAR SUBSTATION AT UTWAD, DIST. JALNA ALONG WITH ASSOCIATED TRANSMISSION LINES UNDER AURANGABAD ZONE

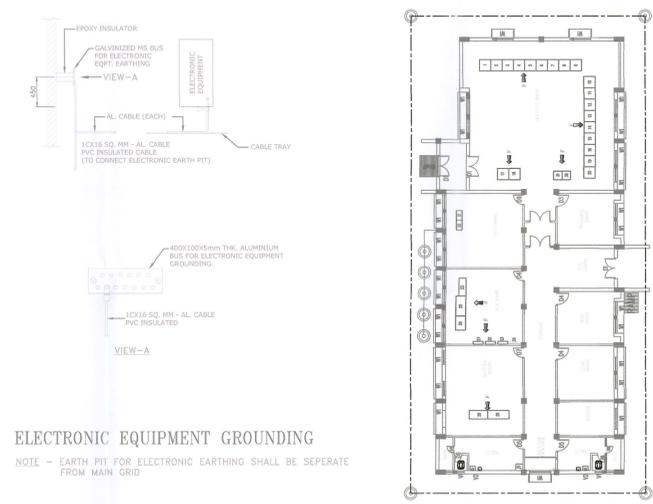
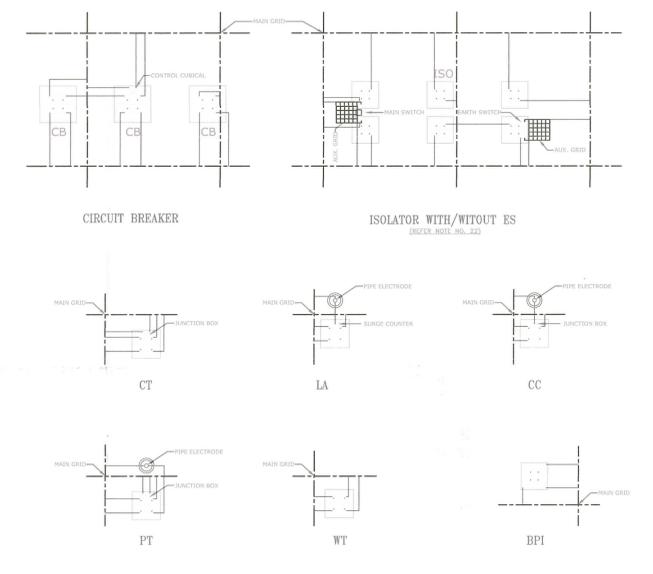
TITLE: CONTROL ROOM CONDUIT LAYOUT

DRAWN	MSB	DATE: 02/07/2022	
CHECKED	TSS	SCALE: 1:60	
APPROVED	TEC	SIZE: A1	SHEET No. 03 OF 03
PASSED	TEC	REV. R0	

DRG. No. TSL-MHA-SEOLI-ELE-014



TYPICAL EQUIPMENTS EARTHING DETAILS WITH JUNCTION BOX/M. BOX/CONTROL CUBICAL



- LEGENDS**
- PIPE ELECTRODE
 - MAIN EARTHING GRID
 - EARTHING RISER
 - AUX. GRID
 - PRESENT SCOPE
 - FUTURE / NOT IN SCOPE
 - FENCE

- NOTES**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
 - ONLY EQUIPMENT EARTHING AREA, RISERS FOR TOWER AND ELECTRODE ARRANGEMENT ARE REPRESENTED IN THE DRAWING. EVERY EQUIPMENT SHALL BE CONNECTED TO MAIN EARTH MAT ON BOTH X AND Y DIRECTION GRID AS PER TYPICAL EQUIPMENT EARTHING DETAILS RELEASED BY MSETCL.
 - EARTHING CONDUCTOR IN OUTDOOR AREAS SHALL BE BURIED AT LEAST 600mm BELOW FINISHED GROUND LEVEL UNLESS STATED OTHERWISE.
 - EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED IN EARTH AT A MINIMUM DISTANCE OF 150MM FROM THE OUTER BOUNDARY OF THE BUILDING.
 - WHEREVER EARTHING CONDUCTOR CROSSES CABLE TRENCHES UNDERGROUND SERVICE DUCTS, PIPES, TUNNELS, RAILWAY TRACKS ETC. IT SHALL BE LAID MINIMUM 500mm BELOW THEM AND SHALL BE CIRCUMVENTED IN CASE IT FOULS WITH EQUIPMENTS/STRUCTURE FOUNDATIONS.
 - EARTHING PADS SHALL BE PROVIDED FOR THE APPARATUS/EQUIPMENT AT ACCESSIBLE POSITION. THE CONNECTION BETWEEN THE EARTHING PADS AND THE EARTHING GRID SHALL BE FREE FROM RINGS AND SPICES. IN CASE EARTHING PADS ARE NOT PROVIDED ON THE ITEM TO BE EARTHED, SAME SHALL BE PROVIDED BY BONDING IN CONSULTATION WITH OWNER.
 - WHEREVER SPECIFICALLY SHOWN IN DRAWINGS OR NOT, STEEL/ROD COLUMNS, METALLIC STAIRS, ETC SHALL BE CONNECTED TO THE NEARBY EARTHING GRID CONDUCTOR BY TWO EARTHING LEADS. ELECTRICAL CONTINUITY SHALL BE ENSURED BY BONDING DIFFERENT SECTIONS OF HAND RAIL AND METALLIC STAIRS.
 - METALLIC PIPES, CONDUITS AND CABLE TRAY SECTION FOR CABLE INSTALLATION SHALL BE BONDED TO ENSURE ELECTRICAL CONTINUITY AND CONNECTED TO EARTHING CONDUCTORS AT REGULAR INTERVAL APART FROM INTERMEDIATE CONNECTIONS, BEGINNING POINTS SHALL ALSO BE CONNECTED TO EARTHING SYSTEM.
 - METALLIC PIPES, CONDUITS AND CABLE TRAY SECTION FOR CABLE INSTALLATION SHALL BE BONDED TO ENSURE ELECTRICAL CONTINUITY AND CONNECTED TO EARTHING CONDUCTORS AT REGULAR INTERVAL APART FROM INTERMEDIATE CONNECTIONS, BEGINNING POINTS SHALL ALSO BE CONNECTED TO EARTHING SYSTEM.
 - METALLIC CONDUITS SHALL NOT BE USED AS EARTH CONTINUITY CONDUCTOR.
 - WHEREVER EARTHING CONDUCTOR CROSSES OR RUNS ALONG METALLIC STRUCTURE SUCH AS GAS, WATER, STEAM CONDUITS, ETC. AND STEEL REINFORCEMENT IN CONCRETE IT SHALL BE BONDED TO THE SAME.
 - LIGHT POLES, JUNCTION BOXES ON THE POLES, CABLE BOXES/GLANDS, LOCKOUT SWITCHES ETC. SHALL BE CONNECTED TO THE EARTHING CONDUCTOR RUNNING ALONG WITH THE SUPPLY CABLE WHICH RETURN SHALL BE CONNECTED TO EARTHING GRID CONDUCTOR AT A MINIMUM TWO POINTS WHETHER SPECIFICALLY SHOWN OR NOT.
 - RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE EARTHED AT A SPACING OF 30M AND ALSO AT BOTH ENDS.
 - EARTHING CONDUCTOR SHALL BE BURIED 1000mm OUTSIDE THE SWITCHYARD FENCE. ALL THE GATES & EVERY ALTERNATE POST OF THE FENCE SHALL BE CONNECTED TO EARTHING GRID.
 - EARTHING CONDUCTOR SHALL BE BURIED 500mm INSIDE BOUNDARY WALL OF SWITCHYARD.
 - THE STONE SPREADING SHALL ALSO BE DONE 200mm OUTSIDE SWITCHYARD FENCE. THE CRITERION FOR STONE SPREADING SHALL BE FOLLOWED IN LINE WITH REQUIREMENT SPECIFIED ELSEWHERE IN THE SPECIFICATION.
 - FLEXIBLE EARTHING CONNECTORS SHALL BE PROVIDED FOR THE MOVING PARTS.
 - ALL LIGHTING PANELS, JUNCTION BOXES, RECEPTACLE FIXTURES, CONDUITS, ETC. SHALL BE GROUNDED IN COMPLIANCE WITH PROVISION OF I.C. RULES.
 - 50mm x 8mm G.I. FLAT SHALL RUN ON THE TOP TIER AND ALL ALONG THE CABLE TRENCHES AND THE SAME SHALL BE WELDED TO EACH OF THE RACKS. FURTHER THIS FLAT SHALL BE EARTHED AT BOTH ENDS AND AT AN INTERVAL OF 50M. THE M.S. FLAT SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER AND TWO COATS OF POST OFFICE RED ENAMEL PAINTS.
 - EARTHING CONNECTION WITH EQUIPMENT EARTHING PADS SHALL BE BOLTED TYPE. CONTACT SURFACES SHALL BE FREE FROM SCALE, PAINT, GREASE, RUST OR DIRT. TWO BOLTS SHALL BE PROVIDED FOR MAKING EACH CONNECTION. EQUIPMENT BOLTED CONNECTION, AFTER BEING CHECKED AND TESTED, SHALL BE PAINTED WITH ANTI CORROSIVE PAINT/COMPOUND.
 - CONNECTION BETWEEN EQUIPMENT EARTHING LEAD AND MAIN EARTHING CONDUCTOR AND BETWEEN MAIN EARTHING CONDUCTOR SHALL BE WELDED TYPE. FOR THE BEST PROTECTION THE WELDS SHOULD BE TREATED WITH RED OXIDE AFTERWARD COATED WITH TWO LAYERS OF BITUMEN COMPOUND TO PREVENT CORROSION.
 - AUXILIARY EARTHING MAT COMPRISING OF 75X10mm MS FLAT CLOSELY SPACED (300mm X 300mm) CONDUCTOR SHALL BE PROVIDED AT DEPTH OF 300mm FROM FGL BELOW THE OPERATING HANDLES OF MARSHALLING BOXES OF THE ISOLATORS. M. BOXES SHALL BE DIRECTLY CONNECTED TO AUX. MAT.
 - METALLIC SHEATHS AND ARMOUR OF ALL MULTI CORE POWER CABLE SHALL BE EARTHED AT BOTH PANEL & SWITCHGEAR END. SHEATH ARMOUR OF SINGLE CORE CABLE SHALL BE EARTHED AT SWITCHGEAR END ONLY.
 - NO. OF PLUG ELECTRODES SHALL BE CONNECTED WITH EACH OTHER & SHALL BE KEPT ISOLATED FROM MAIN EARTH MAT GRID.
 - EVERY EQUIPMENT SHALL HAVE TWO SEPARATE EARTHING CONNECTION.
 - L.A. EARTHING SHALL BE TERMINATED DIRECTLY ON EARTHING ELECTRODES AND IN TURN SHALL BE CONNECTED TO MAIN EARTH MAT.

BILL OF MATERIAL

NO.	SYMBOL	DESCRIPTION	QTY.
1.	⊙	150mm, 3M LONG C.I. PIPE ELECTRODE	75 NOS. (approx)
2.	—	75x10mm M.S. FLAT (MAIN GRID)	11 KMS. (approx)
3.	⊙	75x10mm M.S. FLAT (AUX. EARTH GRID)	E. A.

- REFERENCE:**
- MSETCL'S LAYOUT PLAN NO. TSL-MHA-SEOLI-ELE-001 [SHEET 1 OF 2] REV. R3
 - MSETCL'S TECHNICAL SPECIFICATION
 - IEEE 80-2013 STANDARD
 - CBIP PUBLICATION NO. 339 (2017)
 - BIS 3043-2018 STANDARD

REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R0	27.10.2021	RELEASED BASED ON SRT REPORT RECOMMENDED BY SE, EHV PC, AURANGABAD	DY.E.E.	AD.E.E.	E.E.

PROJECT : ESTABLISHMENT OF 132/33kV UTWAD AIS SUBSTATION, DIST. JALNA UNDER AURANGABAD ZONE ON TURNKEY BASIS AGAINST TENDER NO. T-1955

LOA NO. : MSETCL/CO/C&M/PT/CAMP/MUM./01 DATED: 29.05.2020

AGENCY : M/s TESLA TRANSFORMERS (INDIA) LTD., BHOPAL (M.P.)

MAHATRANSCO
Maharashtra State Electricity Transmission Co. Ltd.

PROJECT NO. C-19, E-BLOCK, PRAKASHGANGA, BANDRA - KURLA COMPLEX BANDRA (E), MUMBAI - 400 051

DESIGN DEPARTMENT

TITLE : TENTATIVE EARTHMAT LAYOUT

SCALE : 1:1000

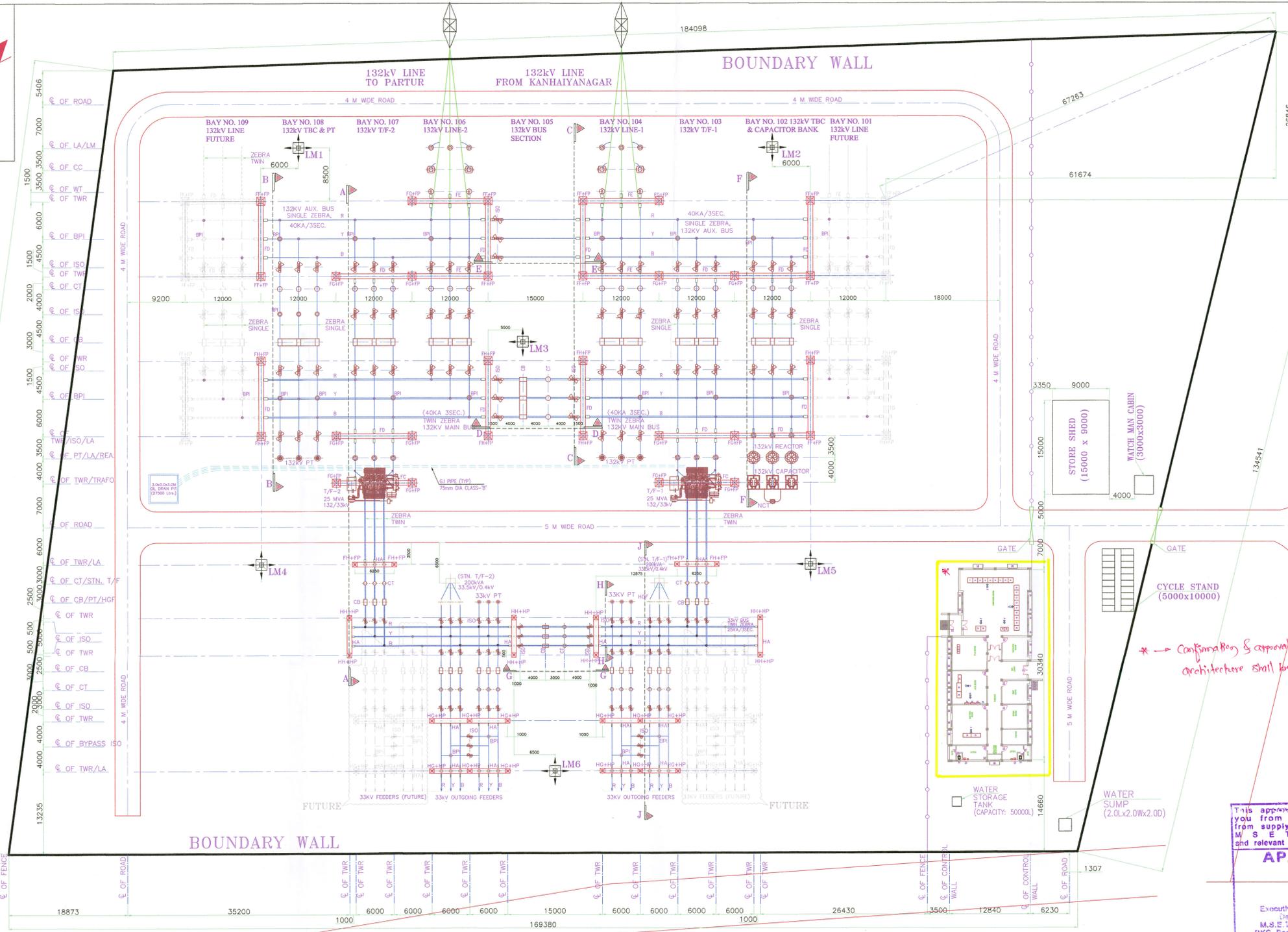
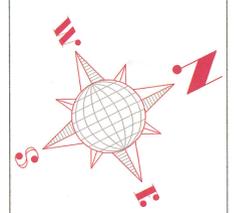
EARTHMAT DESIGN FOR 132/33kV UTWAD:

- | | |
|---|------------------------|
| 1) AVERAGE SOIL RESISTIVITY | = 25.09 Q-m |
| 2) FAULT CURRENT | = 40kA |
| 3) VOLTAGE LEVEL OF SUBSTATION | = 132kV |
| 4) EQUIVALENT LENGTH OF SWITCHYARD FOR CALCULATION PURPOSE | = 162.07 MTR. |
| 5) EQUIVALENT BREADTH OF SWITCHYARD FOR CALCULATION PURPOSE | = 126.26 MTR. |
| 6) NO. OF ELECTRODES [C.I. PIPE, 150MM DIA., 3 MTR. LONG] | = 78 |
| 7) LENGTH OF EARTH ELECTRODES | = 3 MTR. |
| 8) CONDUCTOR SPACING | = 8 MTR. |
| 9) NO. OF PARALLEL CONDUCTORS LENGTHWISE | = 16 |
| 10) NO. OF PARALLEL CONDUCTORS BREADTHWISE | = 23 |
| 11) EQUIVALENT LENGTH OF GRID CONDUCTOR ALONG LENGTH OF SWITCHYARD | = 2593.12 MTR. |
| 12) EQUIVALENT LENGTH OF GRID CONDUCTOR ALONG BREADTH OF SWITCHYARD | = 2903.98 MTR. |
| 13) TOTAL LENGTH OF EARTH CONDUCTOR IN SWITCHYARD | = 7251.10 MTR. |
| 14) TOLERABLE STEP POTENTIAL [E. STEP] [FOR AVG. WEIGHT OF 70KG.] | = 2336.30 VOLTS |
| 15) TOLERABLE TOUCH POTENTIAL [E. TOUCH] [FOR AVG. WEIGHT OF 70KG.] | = 701.83 VOLTS |
| 16) ATTAINABLE STEP POTENTIAL | = 114.41 VOLTS |
| 17) ATTAINABLE TOUCH POTENTIAL | = 156.34 VOLTS |
| 18) SIZE OF EARTH CONDUCTOR | = 75 x 10 MM M.S. FLAT |
| 19) GROUND RESISTANCE [Rg] | = 0.085 Q |
| 20) SIZE OF RISERS FOR EQUIPMENT EARTHING | = 50 x 8 MM G.I. FLAT |
| 21) GROUND POTENTIAL RISE (GPR) | = 2030.40 VOLTS |



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TO EXISTING ROAD

TO EXISTING ROAD

* Confirmation & approval of detail control room building architecture shall be got from Civil Department.

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

APPROVED

Executive Engineer (D&E-S2)
Design Department
M.S.E.T.C.L. "Prakashganga"
BKC, Bandra (East), Mumbai-61

QUANTITY OF STRUCTURE

132 KV				33 KV			
COLUMN WITH BEAM							
TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
FF+FP	09	FE	04	HH+HP	08	HA	14
FG+FP	14	FD	14	HG+HP	12		
FH+FP	07	FC	02	FH+HP	04		

LM - 06 NO's. HEIGHT = 18Mtrs.

REFERENCE DRAWING Nos.

- MSETCL SWITCHYARD LAYOUT REFERENCE DRG. No. D&E-S2/252

NOTES:-

- ALL DIMENSIONS ARE IN MM
- DESIGN VOLTAGE LEVEL
 - a) NOMINAL VOLTAGES 132 KV 33 KV
 - b) MAXIMUM VOLTAGES 145KV 36 KV
 - c) BASIC IMPULSE WITH STAND VOLTAGE (PEAK) 650 KV 170 KV
 - d) SHORT CIRCUIT LEVEL (KA) 40KA/3Sec. 25KA/3Sec.
- MINIMUM CLEARANCES

	132KV	33KV
a) PHASE TO PHASE	1300 MM	320 MM
b) PHASE TO EARTH	1300 MM	320 MM
c) GROUND CLEARANCE	4600 MM	3700 MM
d) SAFETY WORKING CLEARANCE	3700 MM	2800 MM
e) CREEPAGE DISTANCE	25 MM/KV	
- CONDUCTOR SIZES
 - a) MAIN BUS TWIN ZEBRA SINGLE ZEBRA
 - b) TAPS FROM MAIN BUS SINGLE ZEBRA
 - c) TAPS FROM AUX BUS SINGLE ZEBRA
 - d) EQUIP. INTER CONNECTION SINGLE ZEBRA
- LIGHTNING SHIELD WIRE 7/3.15 G.S WIRE
- MECHANICAL INTERLOCK SHALL BE PROVIDED BETWEEN LINE ISOLATORS & ASSOCIATED EARTH SWITCHES.
- ALL THE BUS HEIGHTS ARE REFERRED FROM GROUND LEVEL
- PUNTH OF FOUNDATION WILL BE + 450mm FROM THE FINISHED GROUND LEVEL (FGL) AND GRAVEL TOP LEVEL WILL BE + 150mm FROM FGL.
- EXISTING OH LINE TO BE DIVERTED.
- LIGHTING MAST POSITION IS TENTATIVE AND MAY CHANGE AS PER THE SWITCH YARD LIGHTING DESIGN.
- OIL DRAIN BPT & WATER SUMP POSITION IS TENTATIVE AND WILL BE DECIDED IN CONSULTATION WITH MSETCL CIVIL DN.

LEGEND FOR 132/33KV

SYMBOL	DESCRIPTION
	HORIZONTAL DOUBLE BREAK ISOLATOR
	HORIZONTAL DOUBLE BREAK ISOLATOR WEB.
	LIGHTNING ARRESTOR
	STRING INSULATOR
	CIRCUIT BREAKER
	PT
	BUS POST INSULATOR
	COUPLING CAPACITOR
	WAVE TRAP
	CAPACITOR BANK
	NCT
	REACTOR BANK
	CHAIN LINK FENCING (3M HEIGHT)
	TOWER WITH PEAK
	LIGHTING MAST
	FUTURE
	PRESENT SCOPE

BILL OF QUANTITY FOR 132KV YARD:-

S.NO.	EQUIPMENT	DESCRIPTION	QUANTITY
1.	CIRCUIT BREAKER	2000A, 40KA/SEC, 3P	7 Set.
2.	ISOLATOR	1250A, WITH EARTH SWITCH	2 Set.
		2000A, WITHOUT EARTH SWITCH	2 Set.
		1250A, WITHOUT EARTH SWITCH	4 Set.
3.	CURRENT TRANSFORMER	1600-800/1A, 5 CORE	3 Nos.
4.	WAVE TRAP	800-400/1A, 5 CORE	18 Nos.
5.	COUPLING CAPACITOR	1250A, 0.5mH	4 Nos.
6.	LIGHTNING ARRESTOR (PORCELAIN)	6E00pF 145kV	4 Nos.
7.	LIGHTNING ARRESTOR (POLYMER)	120kV,10KA	9 Nos.
8.	POTENTIAL TRANSFORMER	120kV,10KA	6 Nos.
9.	POWER TRANSFORMER	132kV/√3 110V/√3,110V/√3 *3 CORE	6 Nos.
10.	CAPACITOR BANK	132kV/33kV,25 MVA	2 Nos.
11.	NEUTRAL CURRENT TRANSFORMER	10MVAR	1 No.
12.	BUS POST INSULATOR	145kV, 3625mm Cr., 4KN	16 Nos.

BILL OF QUANTITY FOR 33KV YARD:-

S.NO.	EQUIPMENT	DESCRIPTION	QUANTITY
1.	CIRCUIT BREAKER	1600A, 25KA/3Sec	7 Set.
2.	ISOLATOR	800A, WITH EARTH SWITCH	4 Set.
		1600A, WITHOUT EARTH SWITCH	4 Set.
		800A, WITHOUT EARTH SWITCH	10 Set.
3.	CURRENT TRANSFORMER	1600-800/1A, 4 CORE	9 Nos.
		400-200/1A, 3 CORE	12 Nos.
4.	HORN CAP FUSE	—	2 Set.
5.	STATION TRANSFORMER	33kV/433V, 200kVA,DY11, Z=5%	2 Nos.
6.	LIGHTNING ARRESTOR	30kV,10KA	30 Nos.
7.	POTENTIAL TRANSFORMER	—	6 Nos.

VERIFIED BY

CHECKED BY

REV. NO.	DESCRIPTION	DRAWN/CHKD.	APPD.	DATE
R3	ISSUED FOR APPROVAL	KB	TSS	TEC 14/07/2021
R2	ISSUED FOR APPROVAL	KB	TSS	TEC 01/07/2021
R1	ISSUED FOR APPROVAL	KB	TSS	TEC 26/06/2021
R0	ISSUED FOR APPROVAL	KB	TSS	TEC 04/06/2021

CUSTOMER: MAHARASHTRA STATE ELECTRICITY TRANSMISSION Co. Ltd., ISO 9001-2000 certified

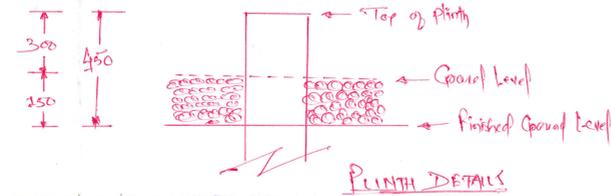
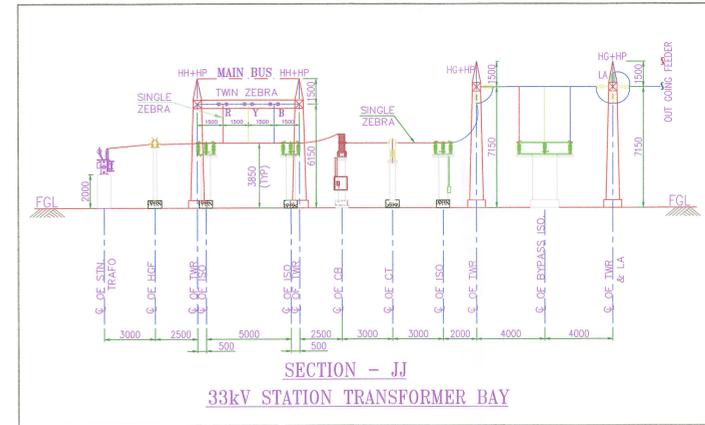
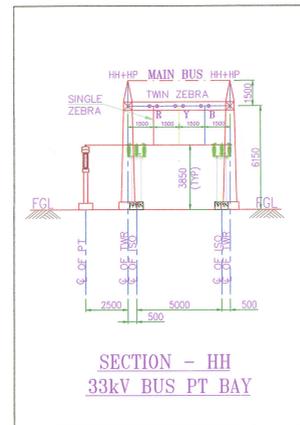
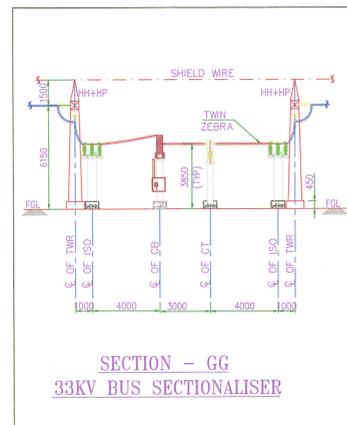
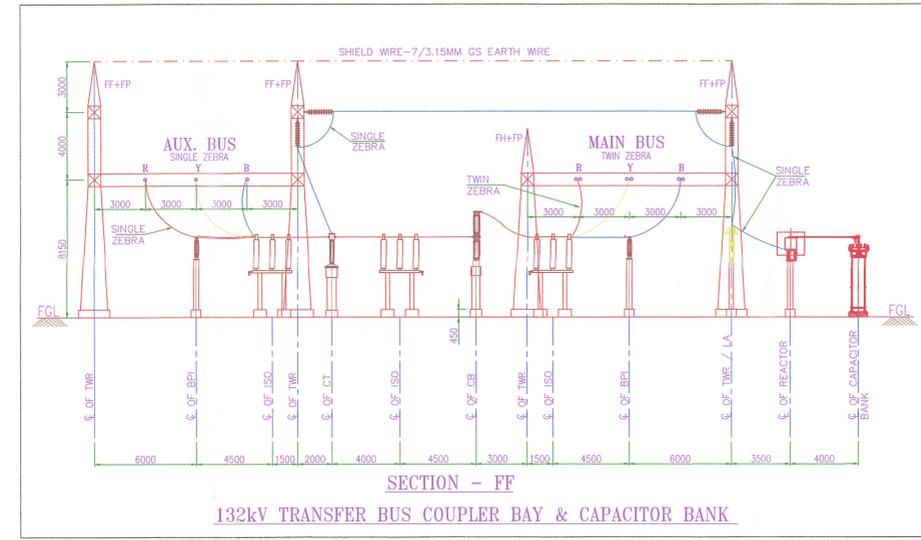
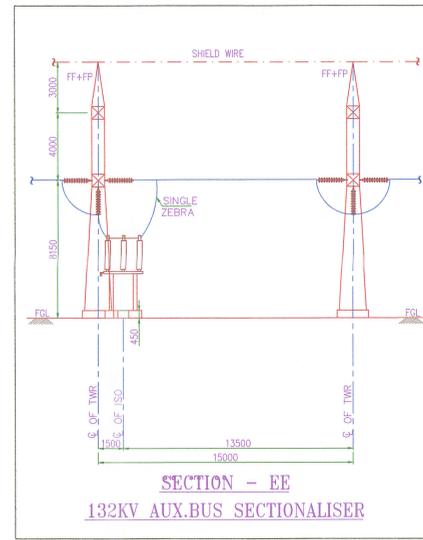
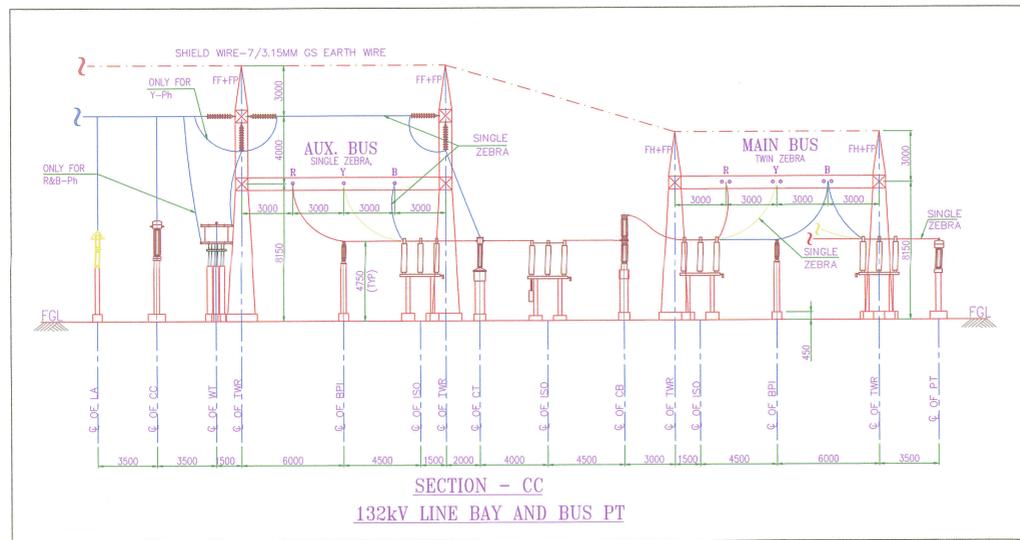
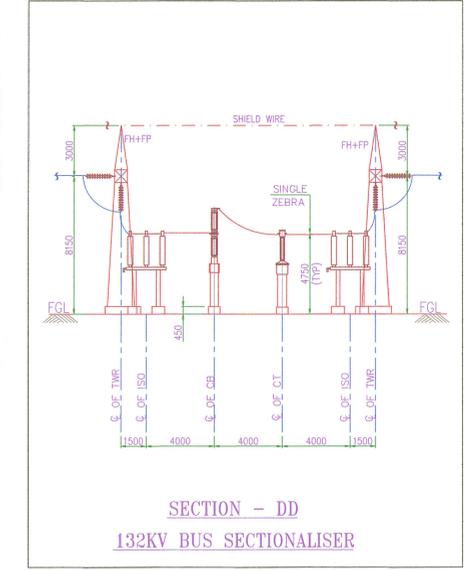
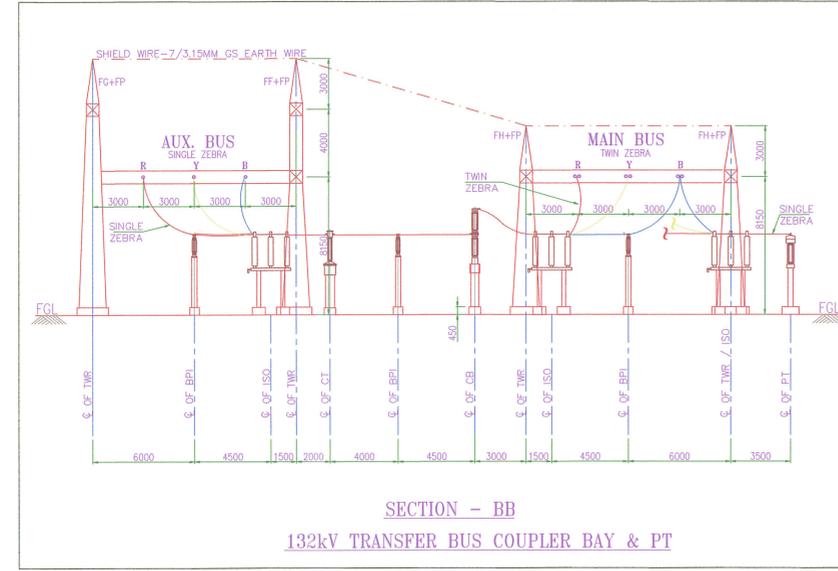
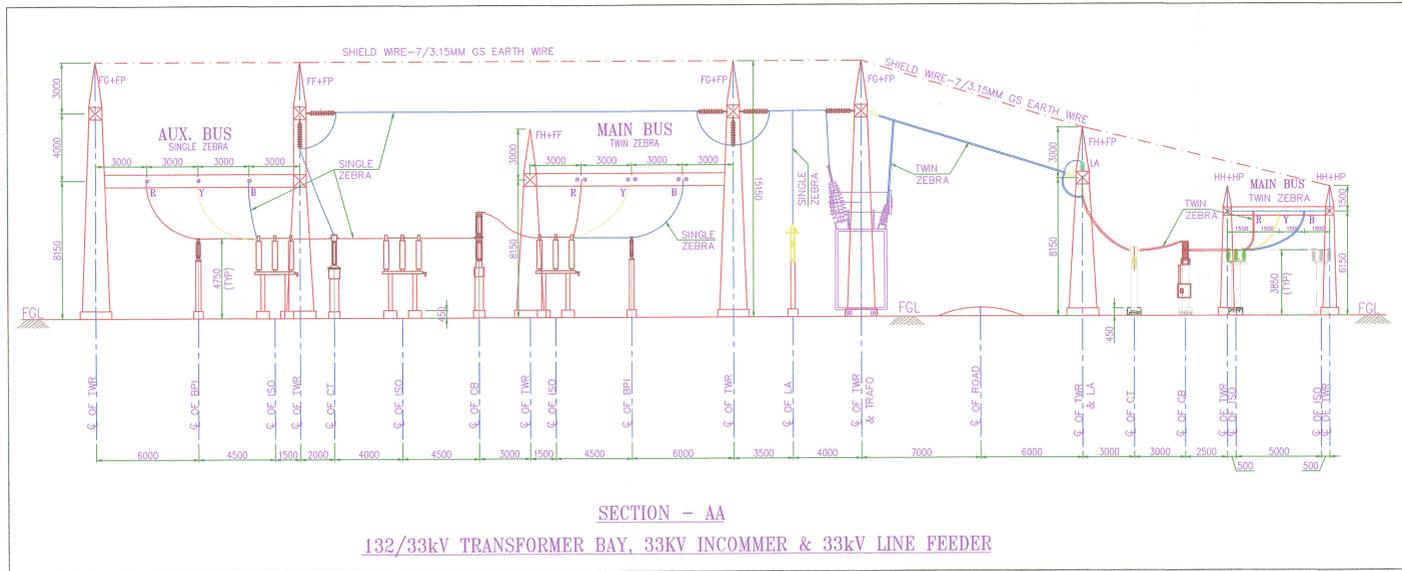
CONTRACTOR: TESLA TRANSFORMERS INDIA LTD 23A, Sector-B, Industrial Area, Govindpura, Bhopal-462023, MP

PROJECT: ESTABLISHMENT OF 132/33kV NER (SEOLI) RAMNAGAR SUBSTATION AT UTWAD, DIST: JALNA ALONG-WITH ASSOCIATED TRANSMISSION LINES UNDER AURANGABAD ZONE

TITLE: 132/33kV ELECTRICAL LAYOUT PLAN & SECTION

DRAWN	MSB	DATE: 04/06/2021	SCALE: 1:325	SHEET No. 1 OF 2	REV. R3
CHECKED	TSS				
APPROVED	TEC				
PASSED	TEC				

DRG. No. TSL-MHA-SEOLI-ELB-001



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

APPROVED

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

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

CUSTOMER:		MAHARASHTRA STATE ELECTRICITY TRANSMISSION Co. Ltd., ISO 9001-2000 certified	
CONTRACTOR:		TESLA TRANSFORMERS INDIA LTD 23A, Sector-B, Industrial Area, Govindpura, Bhopal-462023, MP	
PROJECT: ESTABLISHMENT OF 132/33kV NER (SEOL) RAMNAGAR SUBSTATION AT UTWAD, DIST: JALNA ALONG-WITH ASSOCIATED TRANSMISSION LINES UNDER AURANGABAD ZONE			
TITLE: 132/33kV ELECTRICAL LAYOUT PLAN & SECTION			
DRAWN	MSB	DATE: 04/06/2021	[Symbol]
CHECKED	TSS	SCALE: 1:200	
APPROVED	TEC	SIZE: A1	SHEET No.
PASSED	TEC		2 OF 2
REV. NO.	DESCRIPTION	DRAWN/CHKD. APPD.	DATE
			DRG. No. TSL-MHA-SEOL-ELE-001