

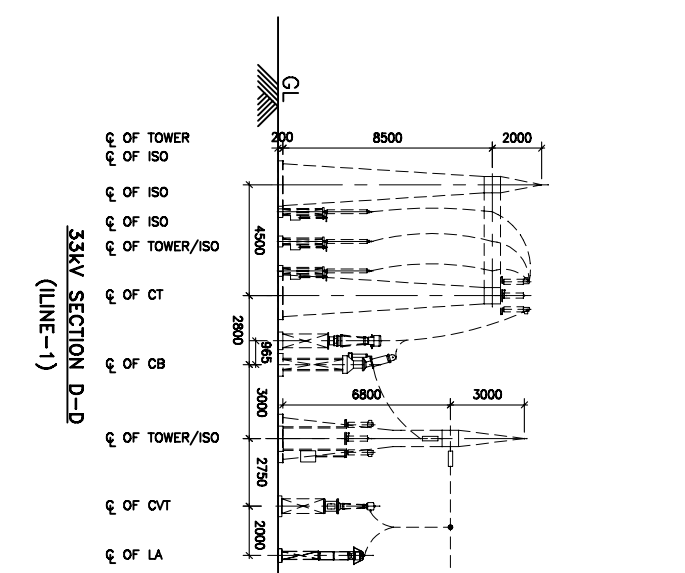
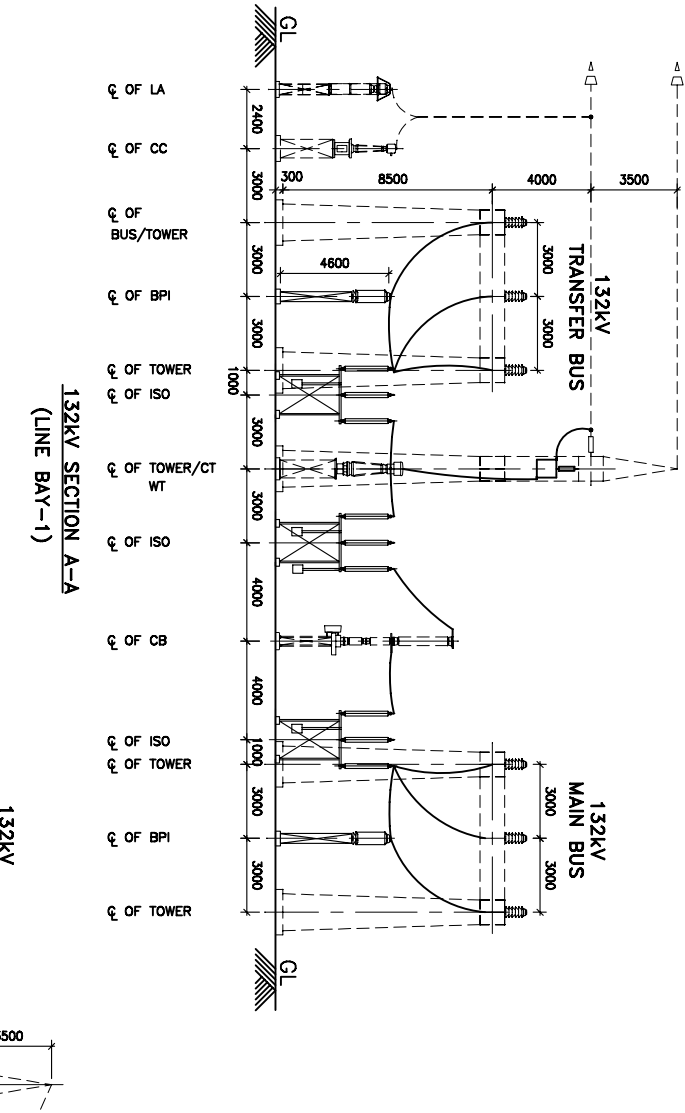
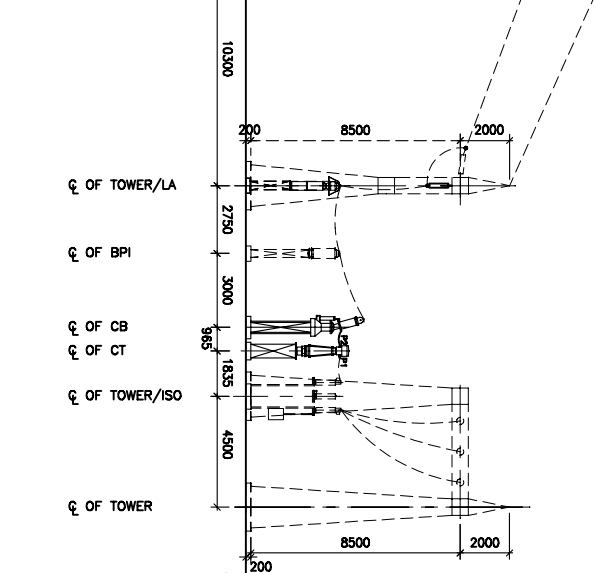
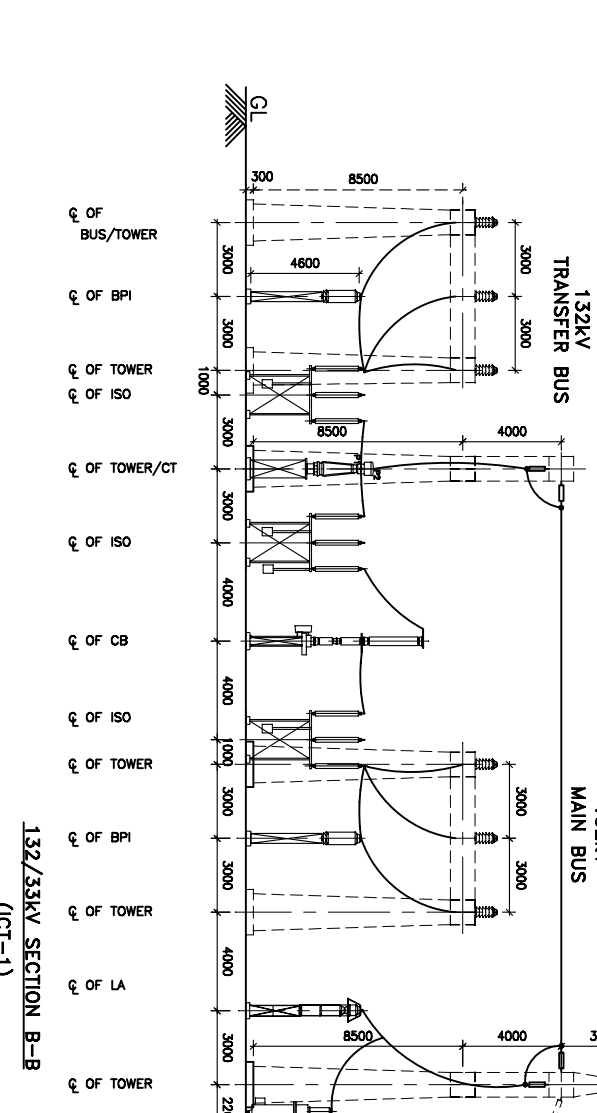
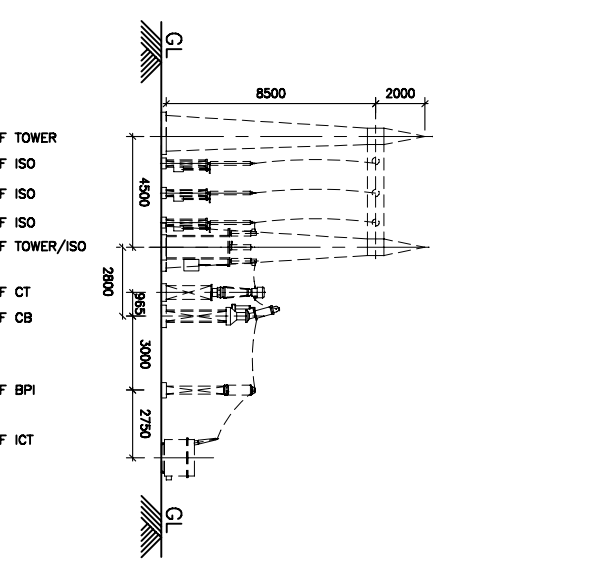
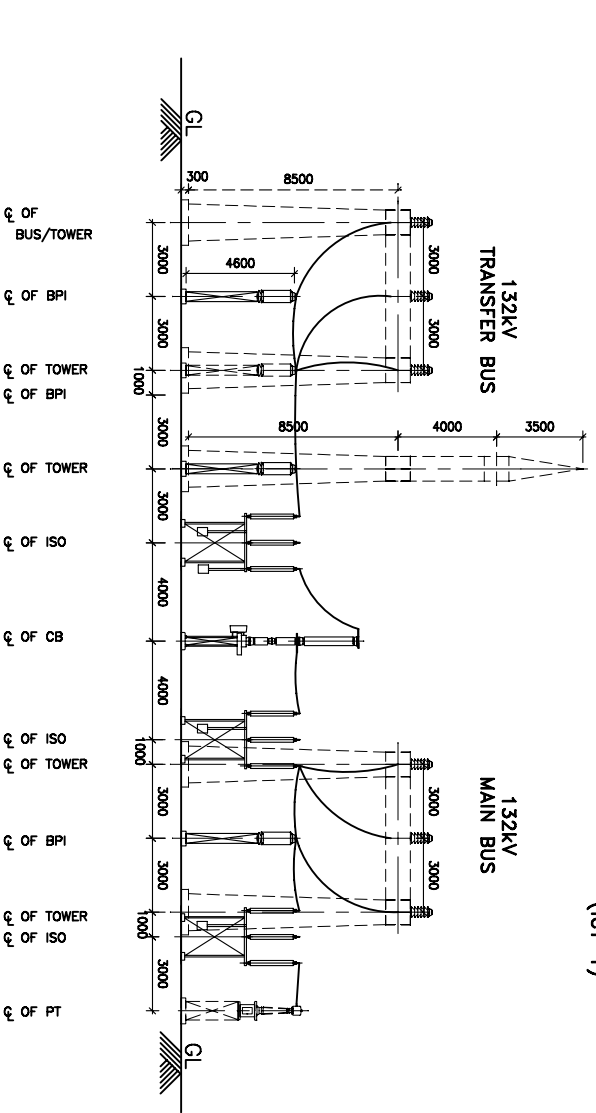
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INVENTORY No.	SGN. & DATE	REF. DRG. No.	COMPUTER DRG. FILE NAME :

REV.	DATE	BY	CHKD.	DESCRIPTION
01	28.11.11			
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				

ADDITIONAL REVISIONS DATE BY CHKD. DESCRIPTION 01 28.11.11 01 REVISION TO BROWNSHAW ADDITIONAL SCOPES	PROJECT RENOVATION AND AUGMENTATION OF 132/33KV EXISTING SUB-STATION AT TORRENSHAW CUSTOMER: MANITRA ELECTRICITY DEPARTMENT (MED) TRANSMISSION PRODUCTS DIVISION	SECTIONAL ELEVATION FOR 132/33KV SWITCHYARD	SHEET NO. / TOTAL SHEETS TB-1-311-316-002 01
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NOTE:
 - - - - - INDICATES NOT IN BHEL SCOPE

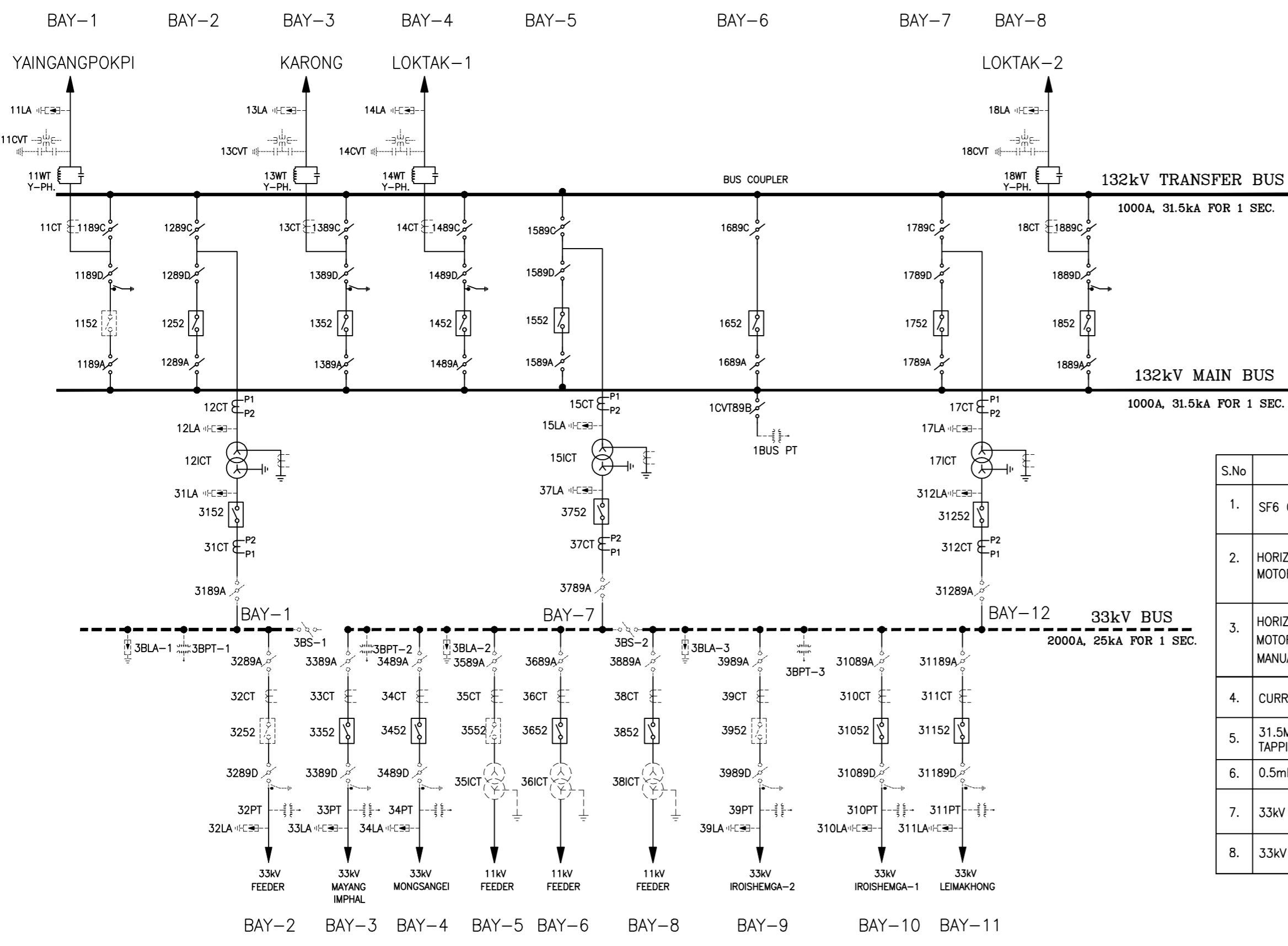


FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM)

DRG. NO. TB-3-311-510-001

1 2 3 4 5 6 7

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OUTDOOR EQUIPMENT DETAILS

S.No	DESCRIPTION	LEGEND	IDENTIFICATION	VOLTAGE CLASS (kV)	QTY. No.
1.	SF6 CIRCUIT BREAKER, 3-POLE 1250A, 3-PH		1252, 1352, 1452, 1552, 1652, 1752, 1852.	145	07
2.	HORIZONTAL DOUBLE BREAK ISOLATOR (MECHANICALLY GANGED MOTOR OPERATED) WITHOUT E/S 1250A, 3-PH		1189A, 1289A, 1389A, 1489A, 1589A, 1689A, 1789A, 1889A, 1289D, 1589D, 1789D, 1189C, 1289C, 1389C, 1489C, 1589C, 1689C, 1789C, 1889C, 1CVT89B.	145	20
3.	HORIZONTAL DOUBLE BREAK ISOLATOR (MECHANICALLY GANGED MOTOR OPERATED WITH ONE E/S (MECHANICALLY GANGED MANUALLY OPERATED)), 1250A, 3-PH		1189D, 1389D, 1489D, 1889A.	145	04
4.	CURRENT TRANSFORMER 200-150/1/1/1/1/1A, 1-PH		12CT, 15CT, 17CT.	145	09
5.	31.5MVA, 132/33kV, Yyn0, % IMPEDANCE 10%±10%, TAPPING +10% TO -10% IN STEPS OF 1.25%		12ICT, 15ICT, 17ICT.	132/33	03
6.	0.5mH, 1250A WAVE TRAPS, 1-PH		11WT, 13WT, 14WT, 18WT.	132	04
7.	33kV OUTDOOR VACUUM CIRCUIT BREAKER. 3-PH		3252, 3352, 3452, 3652, 3752, 3852, 31052, 31152, 31252.	36	09
8.	33kV CURRENT TRANSFORMER 600/1A, 1-PH		31CT, 37CT, 312CT.	36	09

NOTE:-
----- NOT IN SCOPE

PROJECT RENOVATION AND AUGMENTATION OF 132/33kV EXISTING SUB-STATION AT YUREMBAM
CUSTOMER MANIPUR ELECTRICITY DEPARTMENT (MED)

COMPUTER DRG. PATH NAME :

SIGN & DATE

INVENTORY NO.

REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.	NAME	SIGN.	DATE
01	19.09.08		KAPIL	MS/SK	SN					DRAWN	KAPIL	
										CHECKED	MS/SK/GC	-SD-
										APPROVED	SN	-SD-
DISTRIBUTION OF PRINTS												
Revised as per comments dated 26.08.08												

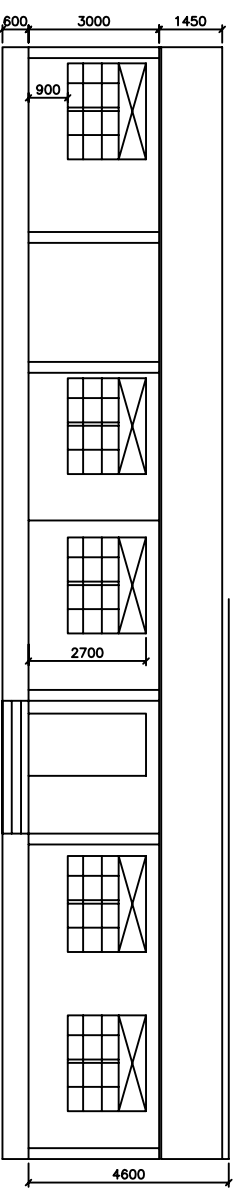
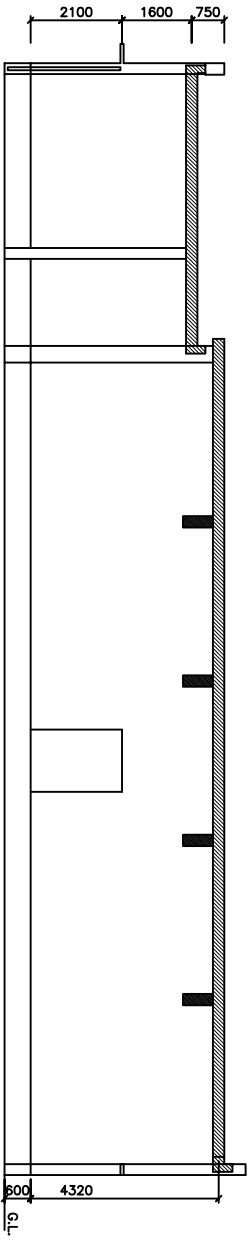
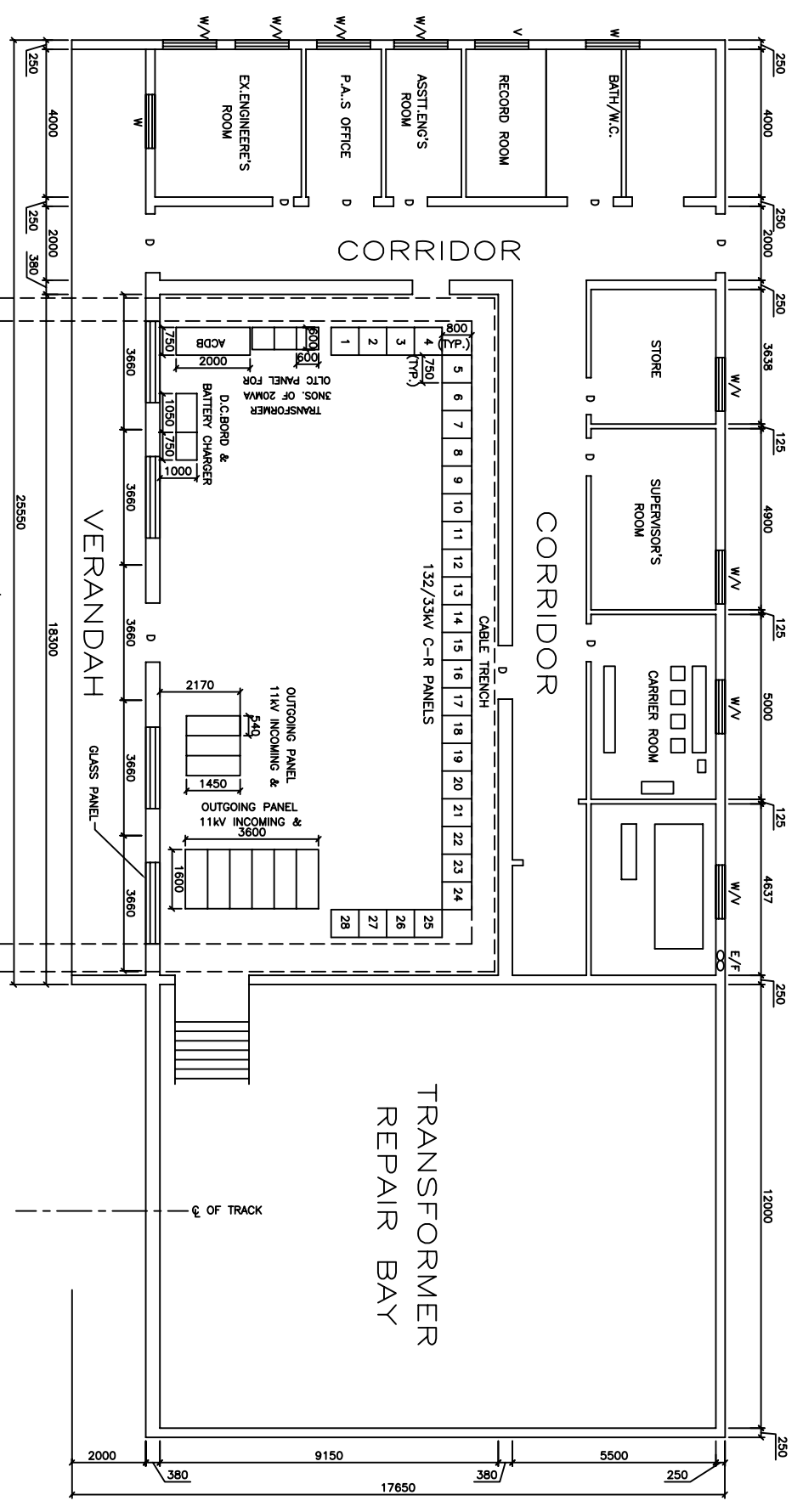


BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION PROJECTS DIVISION		CARD CODE
SINGLE LINE DIAGRAM		NEXT SHEET -
		SHEET No. 01
DEPT.	CODE	REV. 01
TBEM	422	
SCALE	W.O. No.	DRG. No. TB-2-311-510-001

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COMPUTER DRG. PATH NAME :

INVENTORY NO. SIGN & DATE



PANEL NO.	SIZE	PANEL NAME
1	800X750	132KV YAINGANGPPPKI LINE CONTROL PANEL
2	800X750	132KV YAINGANGPPPKI LINE RELAY PANEL
3	800X750	132KV SIDE OF 31.5MVA ICT-1 CONTROL PANEL
4	800X750	132KV SIDE OF 31.5MVA ICT-1 RELAY PANEL
5	800X750	132KV KARONG LINE CONTROL PANEL
6	800X750	132KV KARONG LINE RELAY PANEL
7	800X750	132KV LOKTAK-1 LINE CONTROL PANEL
8	800X750	132KV LOKTAK-1 LINE RELAY PANEL
9	800X750	132KV SIDE OF 31.5MVA ICT-2 CONTROL PANEL
10	800X750	132KV SIDE OF 31.5MVA ICT-2 RELAY PANEL
11	800X750	132KV BUS COUPLER LINE CONTROL PANEL
12	800X750	132KV BUS COUPLER LINE RELAY PANEL
13	800X750	132KV SIDE OF 31.5MVA ICT-3 CONTROL PANEL
14	800X750	132KV SIDE OF 31.5MVA ICT-3 RELAY PANEL
15	800X750	132KV LOKTAK-2 LINE CONTROL PANEL
16	800X750	132KV LOKTAK-2 LINE RELAY PANEL
17	800X750	33KV SIDE OF 31.5MVA ICT-1 CONTROL & RELAY PANEL
18	800X750	33KV FEEDER CONTROL & RELAY PANEL
19	800X750	33KV MAYANG IMPHAL CONTROL & RELAY PANEL
20	800X750	33KV MONGSANGEI CONTROL & RELAY PANEL
21	800X750	33KV SIDE OF 35ICT CONTROL & RELAY PANEL
22	800X750	33KV SIDE OF 36ICT CONTROL & RELAY PANEL
23	800X750	33KV SIDE OF 31.5MVA ICT-2 CONTROL & RELAY PANEL
24	800X750	33KV SIDE OF 38ICT CONTROL & RELAY PANEL
25	800X750	33KV IROSHENGA-2 CONTROL & RELAY PANEL
26	800X750	33KV IROSHENGA-1 CONTROL & RELAY PANEL
27	800X750	33KV LEMAKHONG CONTROL & RELAY PANEL
28	800X750	33KV SIDE OF 31.5MVA ICT-3 CONTROL & RELAY PANEL

PROJECT RENOVATION AND AUGMENTATION OF 132/33KV EXSTING SUB-STATION AT YURENBAM
CUSTOMER MAINPUR ELECTRICITY DEPARTMENT (MED)

BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION PROJECTS DIVISION



CONTROL ROOM PANEL LAYOUT

SCALE W.O. No. --- DRG. No. TB-3-311-510-001





REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.	NAME	SIGN.	DATE
										DRAWN KAPIL		
										CHECKED MS/SK		
										APPROVED SN		

DEPT.	CODE
TBEM	422

CARD CODE	NEXT SHEET
	01
REV.	00

REV.	DATE	ALTERED CHECKED	REV.	DATE	ALTERED CHECKED	REV.	DATE	ALTERED CHECKED	REV.	DATE	ALTERED CHECKED	REV.	DATE	ALTERED CHECKED
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LEGEND

-  CONNECTION TO GROUND MAT THROUGH RISER
-  E CONNECTION TO ROD ELECTRODE.
-  PE CONNECTION TO PIPE ELECTRODE
-  RISER

GENERAL NOTES:

- 1 ALL EARTH STRIPS SHALL BE TAKEN ALONG THE EDGE OF STRUCTURE. ALL DRAWING SHOWS TYPICAL ONLY.
- 2 REFER STANDARD PROCESS SPECIFICATION NO. TB 4 311 509 004 FOR WELDING (SHEET 13 & 14).
- 3 ALL EARTHING SHALL BE DONE IN ACCORDANCE WITH IS: 3043 UNLESS OTHERWISE STATED IN DRAWING.
- 4 ALL EQUIPMENT & STRUCTURE SHALL, IN GENERAL, BE GROUNDED AT TWO POINTS AT OPPOSITE CORNERS WHETHER SHOWN IN DRAWING OR NOT.

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COMPUTER DRG. PATH NAME :

INVENTORY NO. SIGN & DATE REF. DRG. NO.

NO.	DESCRIPTION
02A.	132kV CIRCUIT BREAKER
02B.	33kV CIRCUIT BREAKER
03.	132kV ISOLATER HORIZONTAL DOUBLE BREAK WITHOUT E/S
04.	132kV ISOLATER HORIZONTAL DOUBLE BREAK WITH ONE E/S
05.	132/33kV CURRENT TRANSFORMER
06.	132kV POST INSULATOR
07.	FIXING ARRANGEMENT OF EARTH STRIP CLAMP FOR TUBULAR TYPE STRUCTURE
08.	31.5MVA TRANSFORMER
09.	PIPE EARTH ELECTRODE DETAILS.
10.	MARSHALLING KIOSK EARTHING.
11.	PANELS EARTHING

JOB NO. 88002HYUR
STATUS CONTRACT
DRG./REF. NO.




CUSTOMER RENOVATION AND AUGMENTATION OF 132/33kV EXISTING SUB-STATION AT YUREMBAM
PROJECT MANIPUR ELECTRICITY DEPARTMENT (MED)

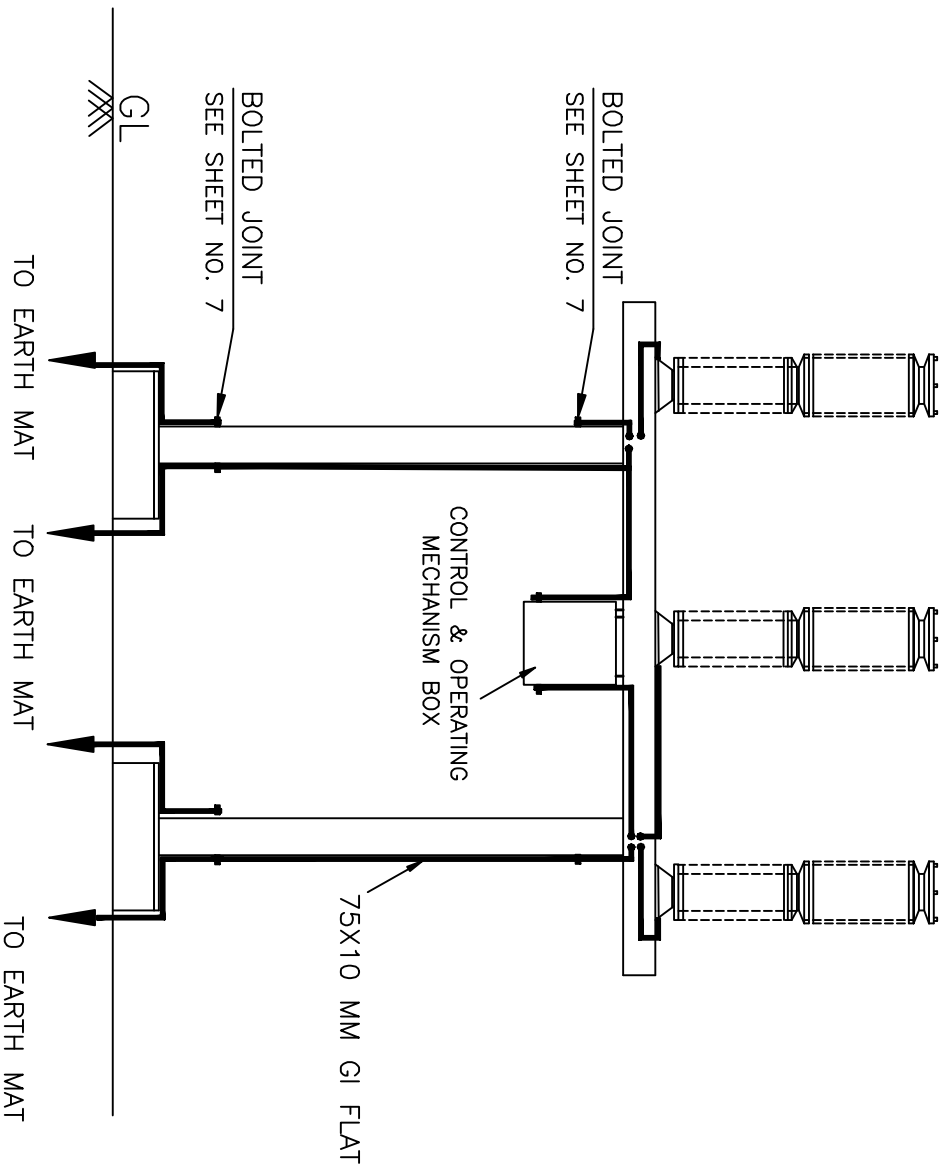
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

DEPT CODE	NAME	SIGN.	DATE
DRN	W/P/L	W/P/L	27.11.08
CHD	W/S/MK		
APPD	SN		

PRINT SCALE
REV. DATE ALTD CHD APPD

REV.	DATE	ALTD	CHD	APPD
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TITLE				
EQUIPMENT EARTHING DETAILS				
DEPT.	SCALE	DRAWING NO.	REV.	DATE
SIGN		TB-4-311-509-004	00	
DATE		SHEET 1		



EQUIPMENT EARTHING DETAILS
132kV CIRCUIT BREAKER

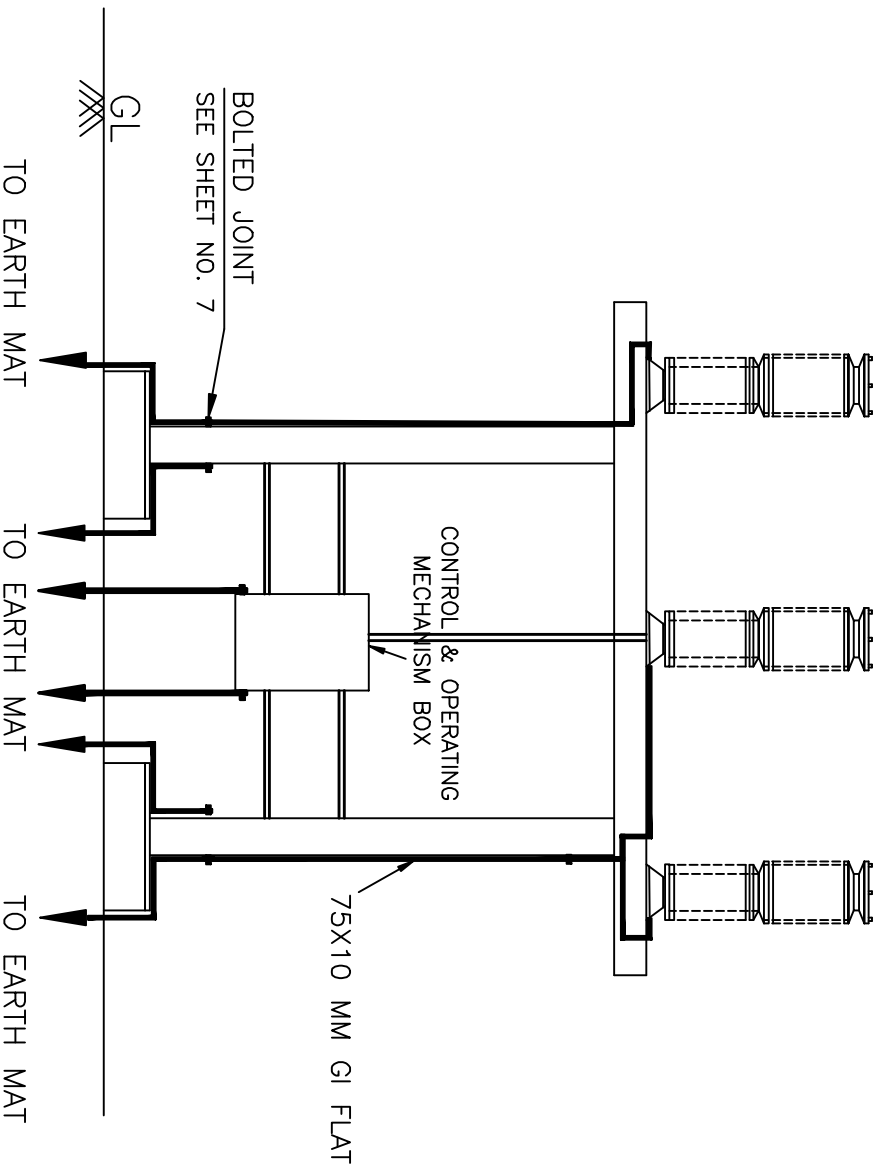
COMPUTER REF. NO.

DRG. No.

TB-4-311-509-004

REV. 00

SHEET No.
02A



EQUIPMENT EARTHING DETAILS
33kV CIRCUIT BREAKER

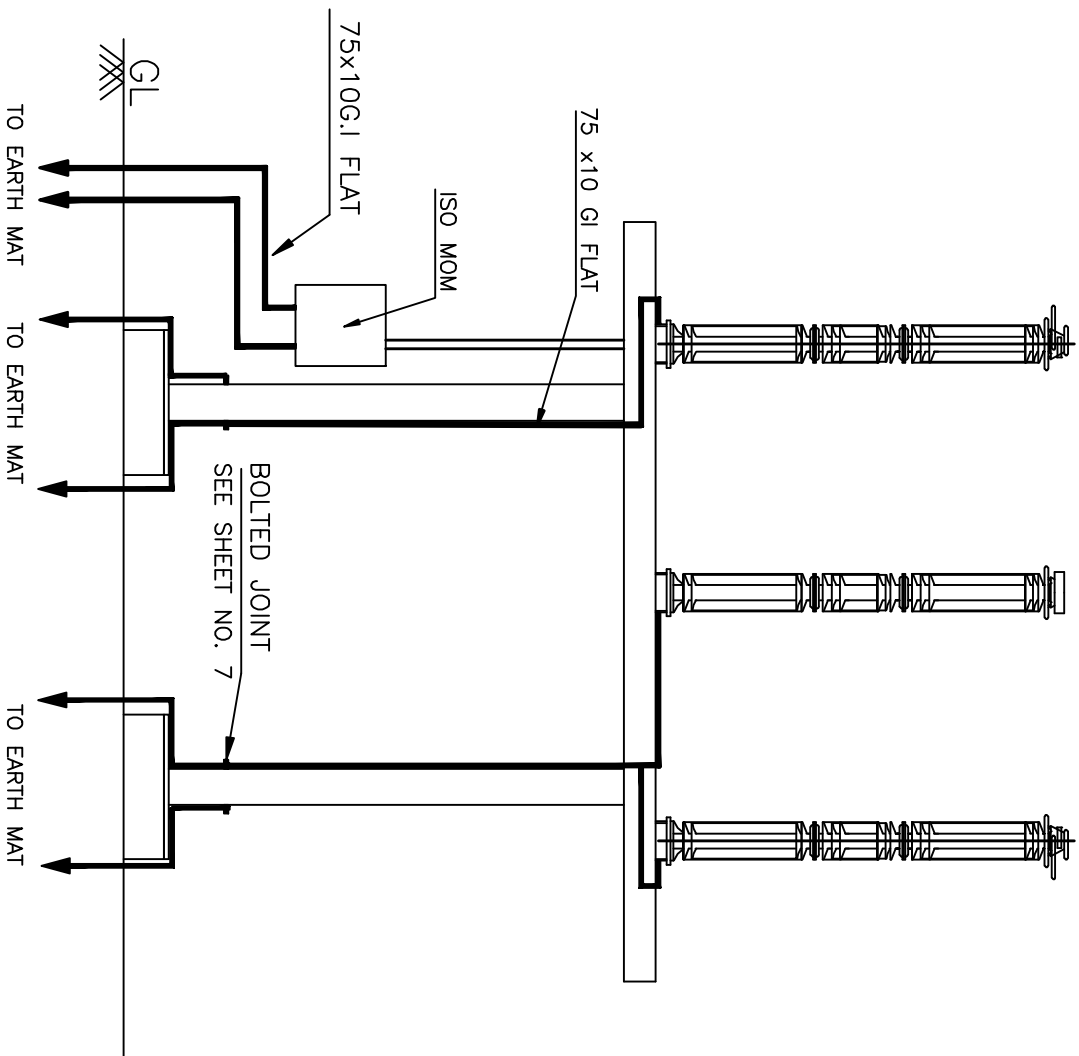
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TB-4-311-509-004

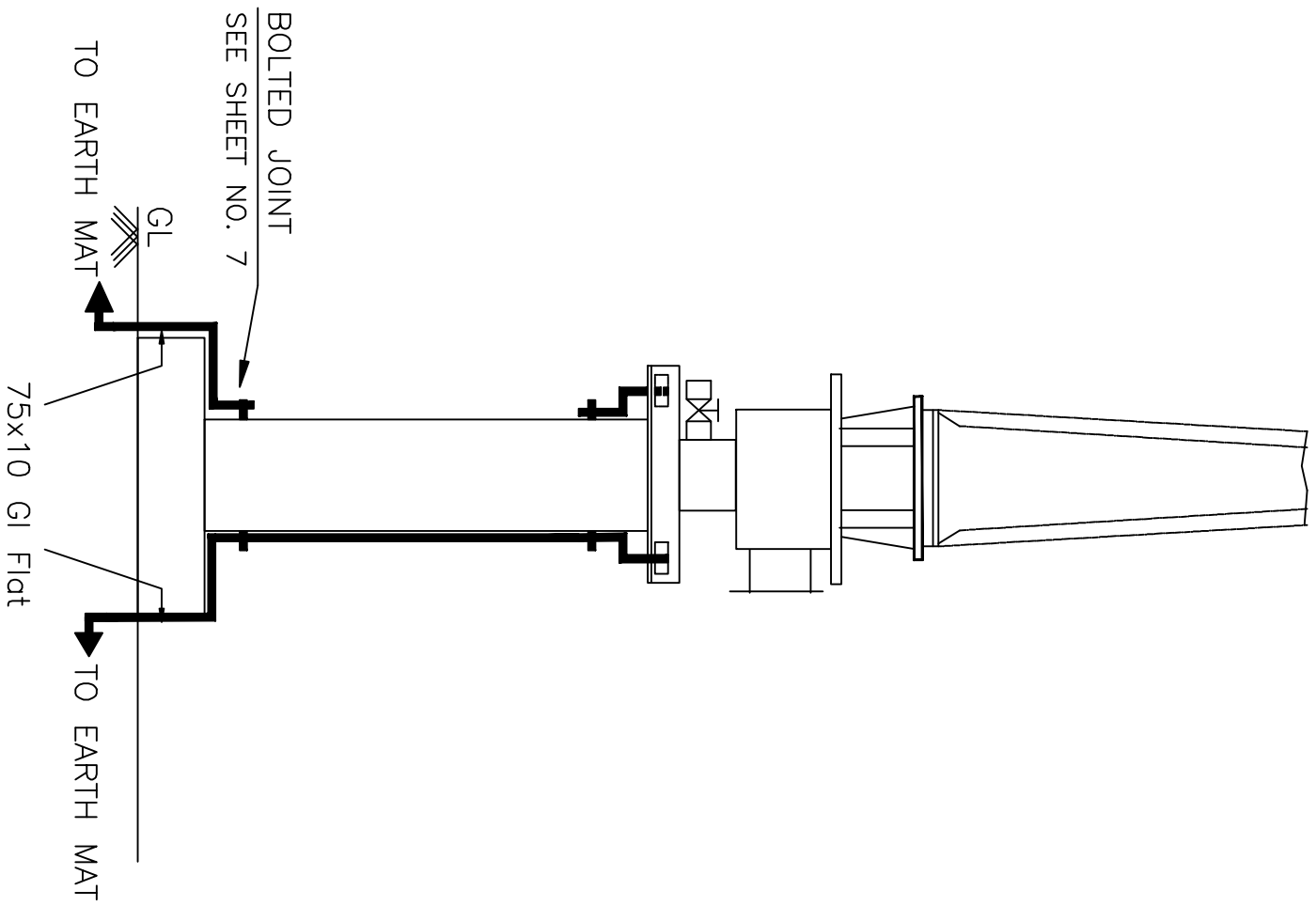
REV. 00

SHEET No.
02B



EQUIPMENT EARTHING DETAILS
132kV ISOLATER HORIZONTAL DOUBLE BREAK WITHOUT E/S

COMPUTER REF. NO.	DRG. No.	TB-4-311-509-004	REV. 00
			SHEET No. 03



EQUIPMENT EARTHING DETAILS
132/33KV CURRENT TRANSFORMER

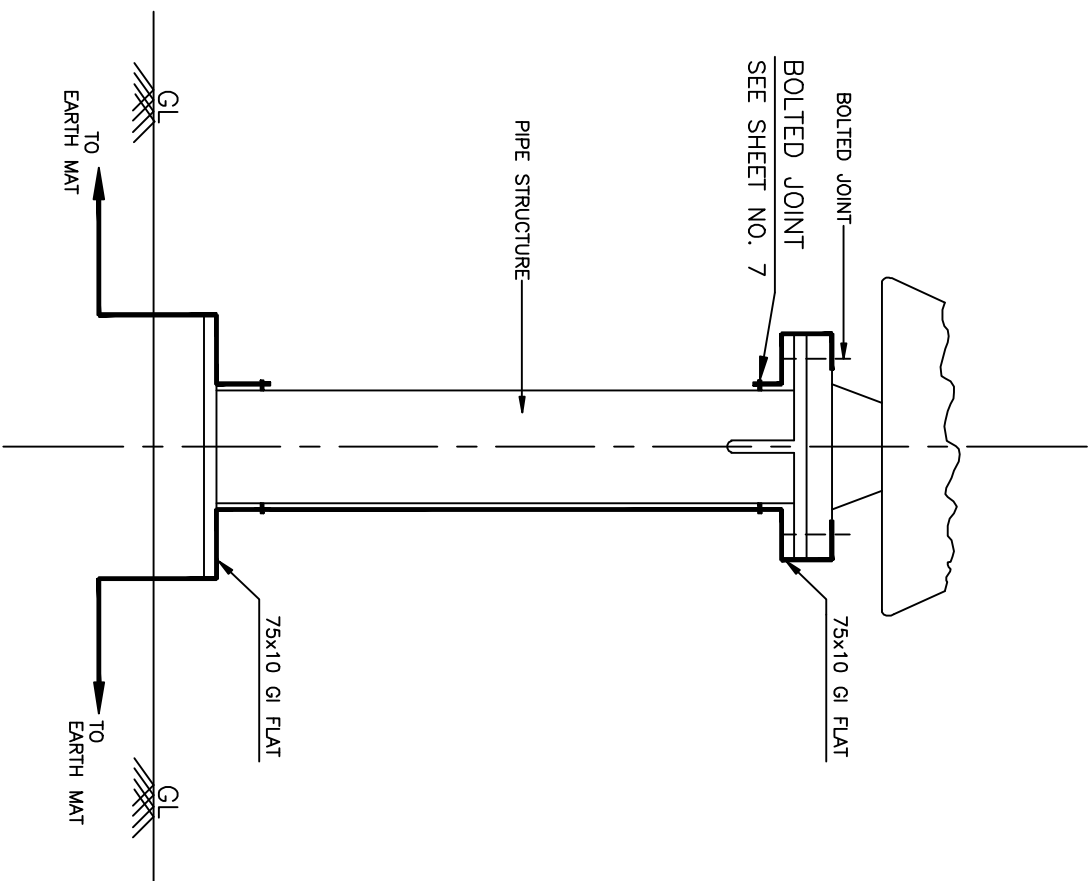
COMP. DRC. REF.

DRG. NO.

TB-4-311-509-004

SHEET No.

05



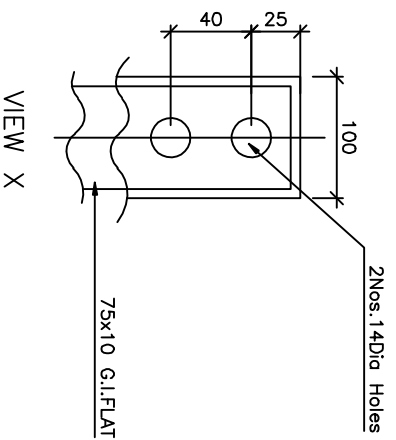
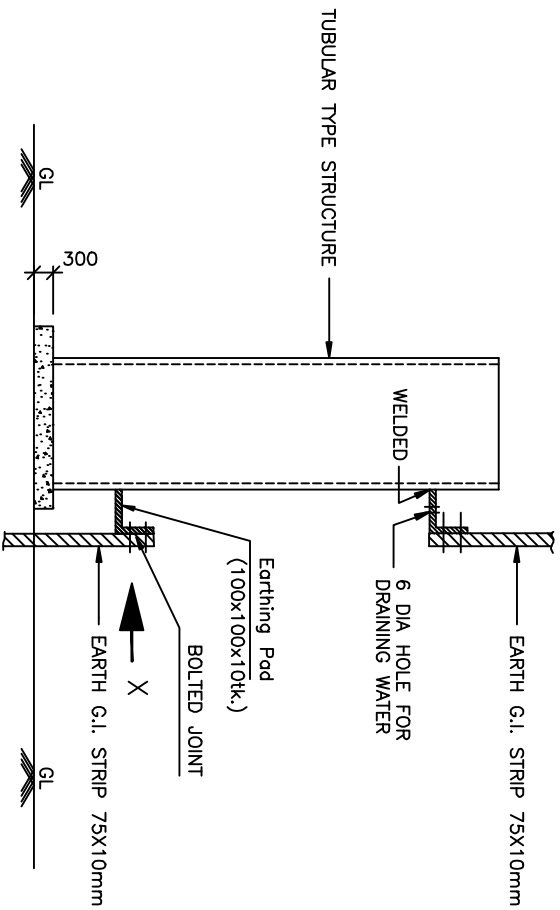
EQUIPMENT EARTHING DETAILS
 132kV POST INSULATOR

COMPUTER REF. NO.

DRG. No.

TB-4-311-509-004

SHEET No.
06



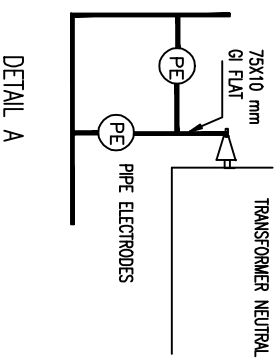
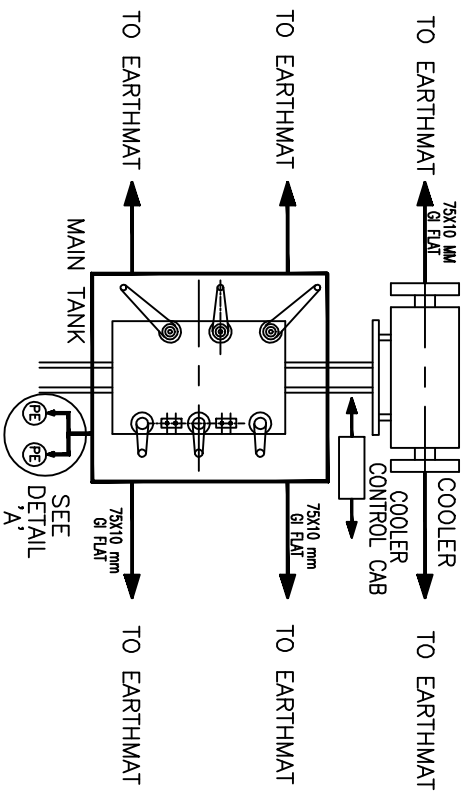
EQUIPMENT EARTHING DETAILS
 FIXING ARRANGEMENT OF EARTH STRIP
 CLAMP FOR TUBULAR TYPE STRUCTURE

COMPUTERREF. NO.

DRG. No.

TB-4-311-509-004

SHEET No.
07



NOTES:-

1. EARTH CONTINUITY ACROSS GASKETED JOINTS MUST BE ENSURED USING FLEXIBLE OR FLAT.
2. ALL ACCESSORIES ASSOCIATED WITH TRANSFORMER LIKE COOLING BANKS, RADIATORS, MAIN TANK, MARSHALLING KIOSK ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS.

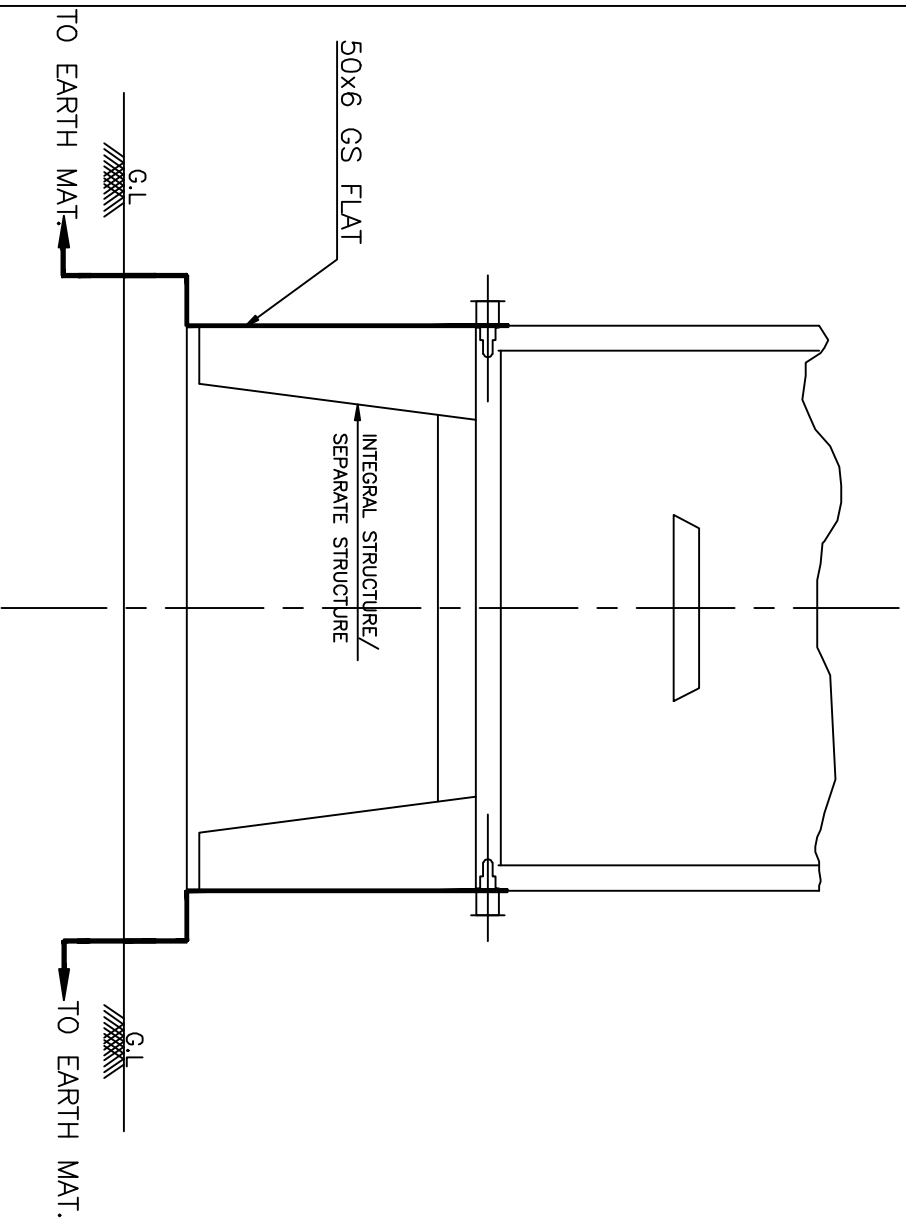


EQUIPMENT EARTHING DETAILS
31.5MVA TRANSFORMER

DRG. No. TB-4-311-509-004

REV. 00

SHEET No.
08



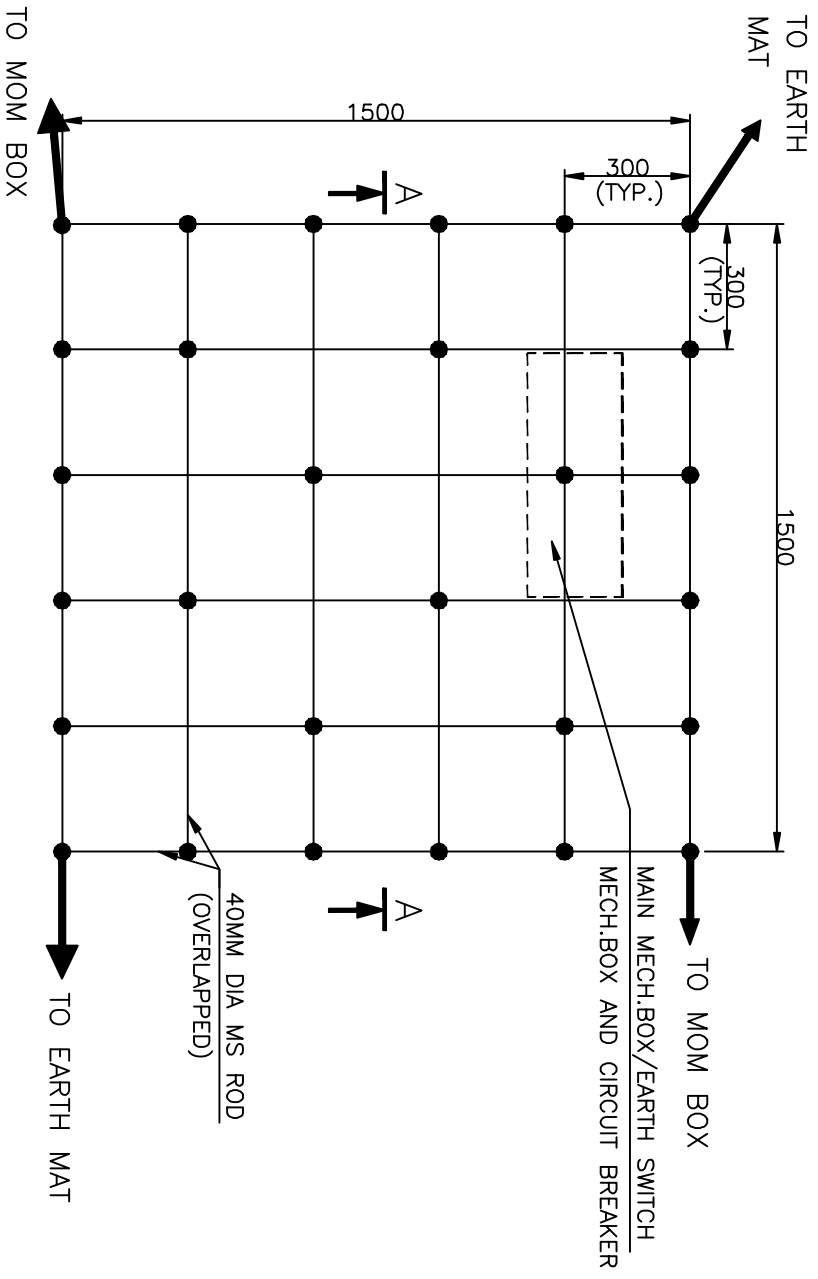
EQUIPMENT EARTHING DETAILS
MARSHALLING KIOSK EARTHING

COMPUTERREF. NO.

DRG. No.

TB-4-311-509-004

SHEET No.
10



NOTE:
 AUX: EARTH MAT SHALL BE SO POSITIONED THAT THE FOOT OF THE OPERATOR ALWAYS LIE OVER THE AUX. EARTH MAT AREA WHILE ATTENDING/OPERATING THE MECH. BOX.



EQUIPMENT EARTHING DETAILS

AUXILIARY EARTH MAT FOR ISOLATOR MOM ,E/S MOM & 33KV CB MOM

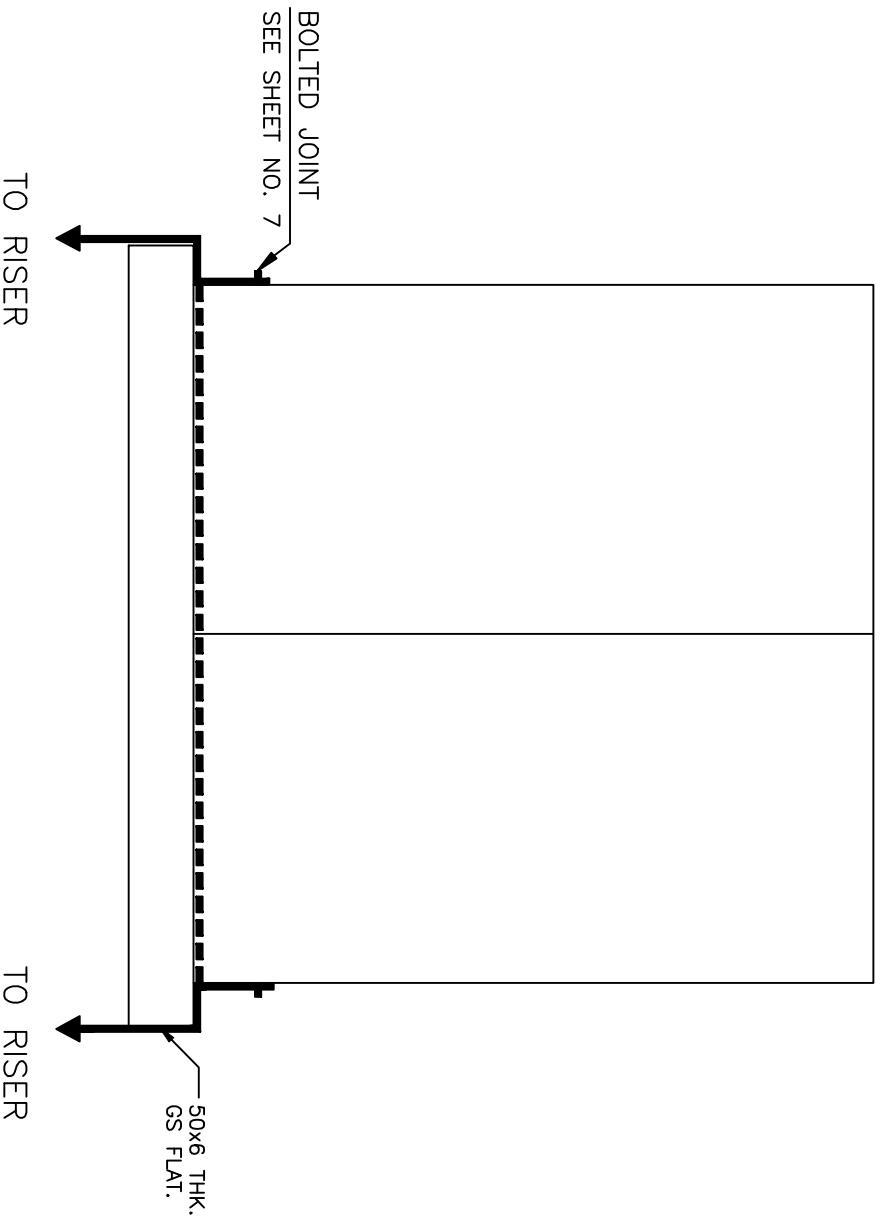
COMPU. DRC. REF.

Report No.

TB-4-311-509-004

SHEET No.

11



NOTE:
 FLEXIBLE EARTHING CONDUCTOR BETWEEN DOOR, PANEL &
 GLAND PLATE ARE SHOWN IN OGA DRAWINGS.

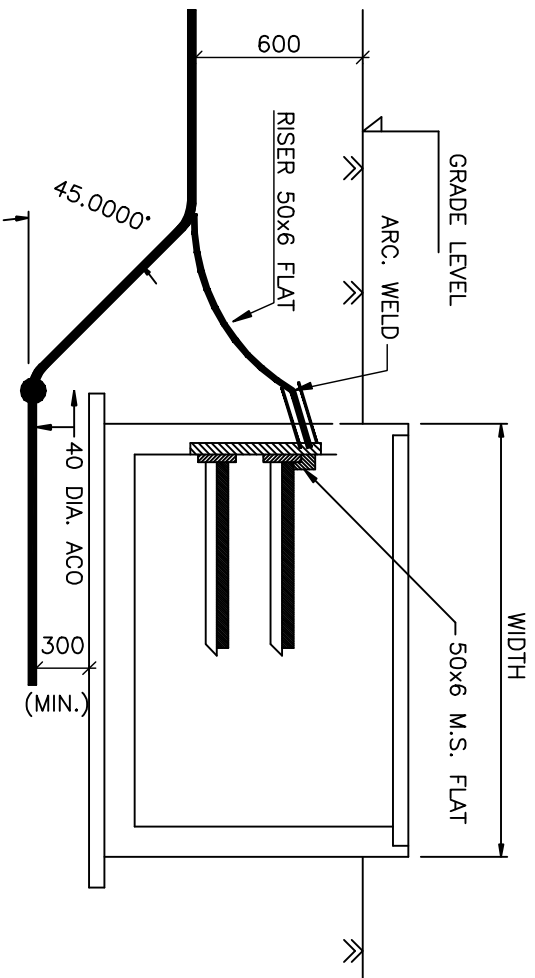


EQUIPMENT EARTHING DETAILS
 PANELS EARTHING

COMPUL. DRG. REF.

Report No. TB-4-311-509-004

SHEET No.
11



NOTE:

1. ALL TRENCHES SHALL BE EARTHED AT AN INTERVAL OF 10M ALONG THE LENGTH OF TRENCH & FREE ENDS.
2. THE EARTH STRIP (50x6 M.S. FLAT) SHALL BE WELDED TO EMBEDDED PLATE AT EVERY 0.75M INTERVAL & CONTROL ROOM AT EVERY 2M INTERVAL
3. THE CABLE RACKS ARE PROVIDED ON BOTH SIDES OF THE TRENCH, BOTH SIDES SHALL BE EARTHED AS PER ABOVE.
4. CABLE EARTHING WILL BE DONE AS PER SPECIFICATION.



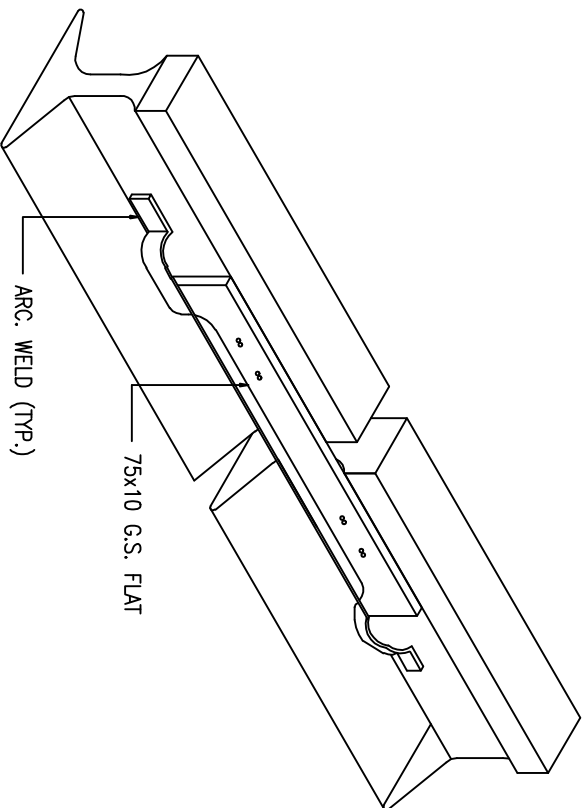
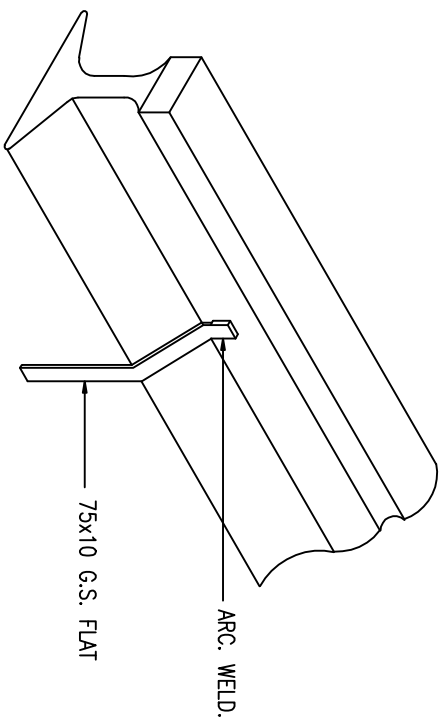
EQUIPMENT EARTHING DETAILS
CABLE TRENCH EARTHING

COMPU. DRG. REF.
E:RAWAT/BELLARY/EQP/SH12

DRG. NO.
TB 4 311 509 004

REV. 01

SHEET
12



NOTE:-
 EACH RAIL TRACKS WITHIN SWITCHYARD SHALL
 BE EARTHED AT BOTH ENDS.



EQUIPMENT EARTHING DETAILS
 RAIL BONDING

COMPU. DRG. REF.	DRG. NO.	TB 4 311 509 004	REV. 00	SHEET No. 13
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