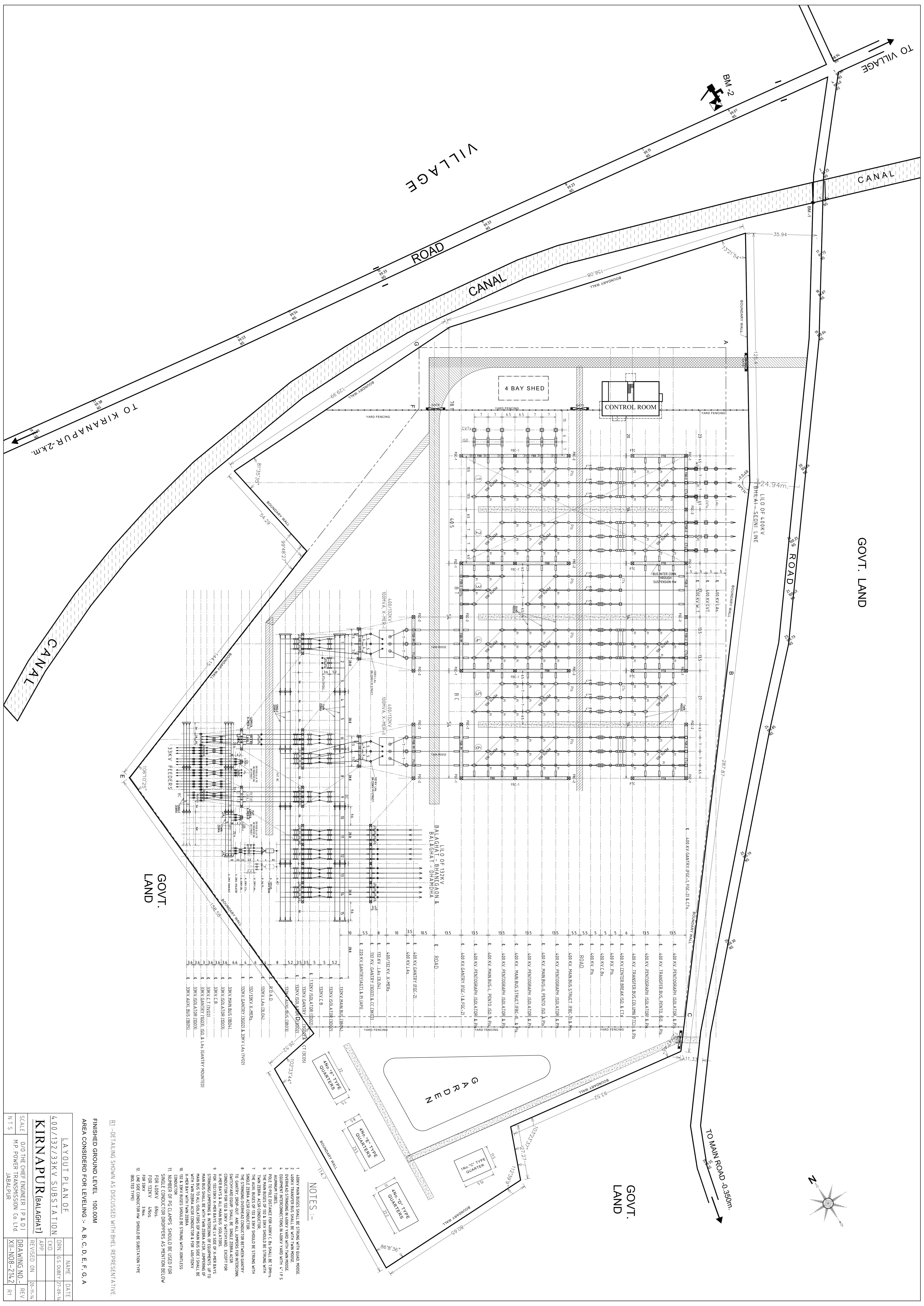
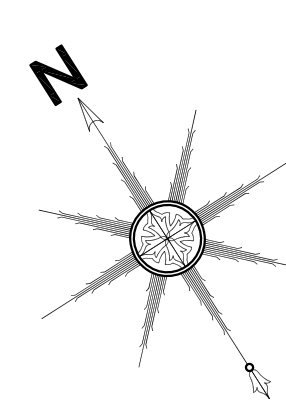


	Annexure 1			
	Drawing list for Balaghat (Kiranapur):			
S. No.	Title	Drawing No., Rev no.		Remarks
		Balaghat (Kiranapur)		
1	Layout Plan	XII-NO8-2142, R1		Attached
2	Elevation	XII-NO8-2145, R1		Attached
3	Foundation plan & cable Trench	XII-NO8-2143, R1		Attached
4	Earthmat arrangement	XII-N08-2144, R1		Attached
5	Equipment earthing details	TB-3-368-316-004,00		Attached
6	Single line diagram	TB-3-368-510-001A,00		Attached

Smb M

GOVT. LAND



NOTES :-

1. 400V MAIN BUSES SHALL BE STRUNG WITH OILD. MOOSE
2. 400V TRANSFER BUS SHALL BE WITH TWIN HOUSE
3. 400V TRANSFER BUS SHALL BE WITH TWIN HOUSE
4. EQUIPMENT INTERCONNECTING IN 400V YARD WITH 4" P.S
5. ALUMINIUM TUBES
6. THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH
7. THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH
8. THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH
9. THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH
10. THE MAIN BUSES OF 132 & 33KV SHOULD BE STRUNG WITH
11. NUMBER OF PG CLAMPS SHOULD BE USED FOR SINGLE CONDUCTOR DROPPERS AS MENTION BELOW
12. LINE SIDE CONDUCTOR T.W. SHOULD BE SUBSTATION TYPE (BUILT TYPE)

FINISHED GROUND LEVEL 100.00M

AREA CONSIDERED FOR LEVELING :- A, B, C, D, E, F, G, A

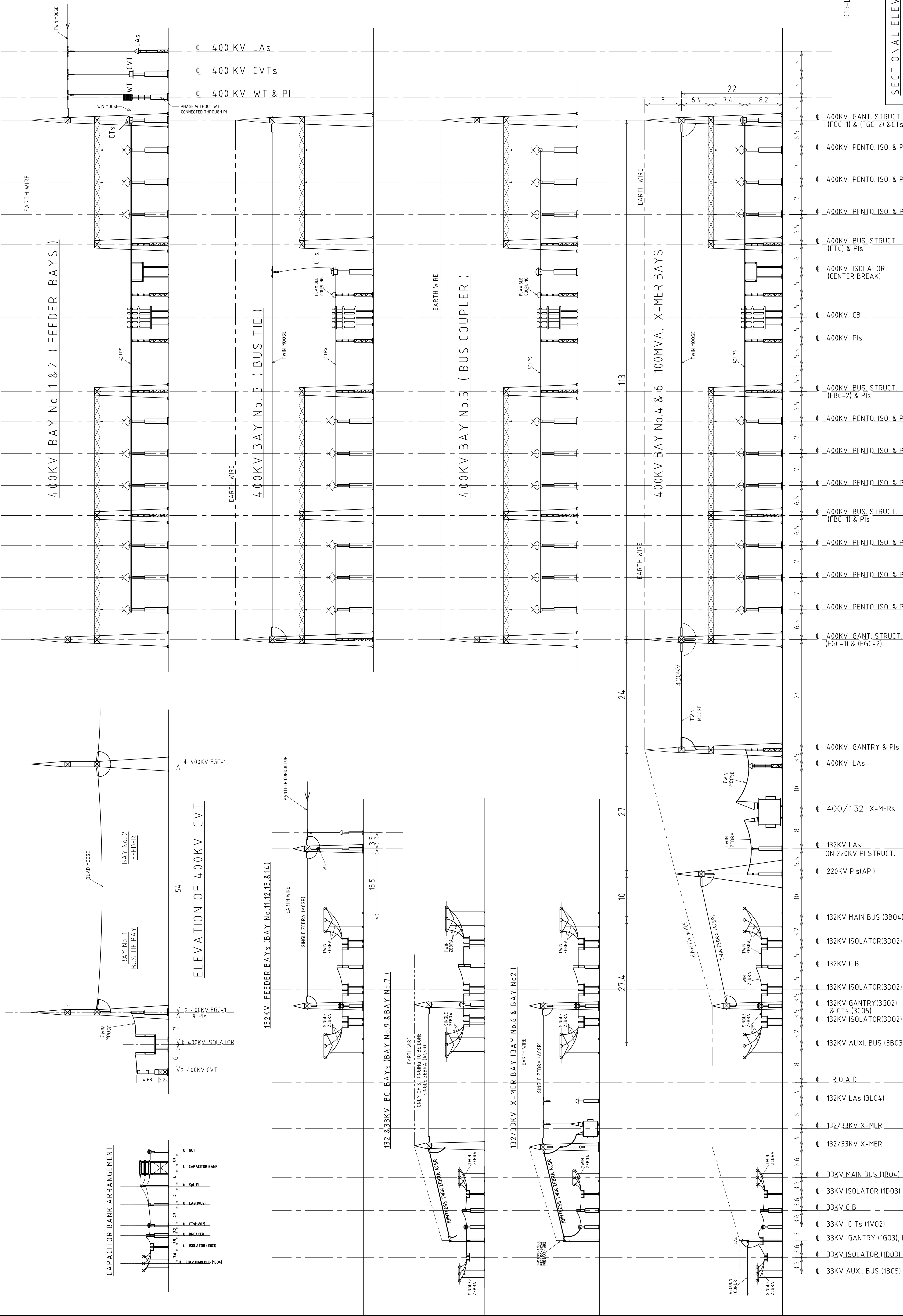
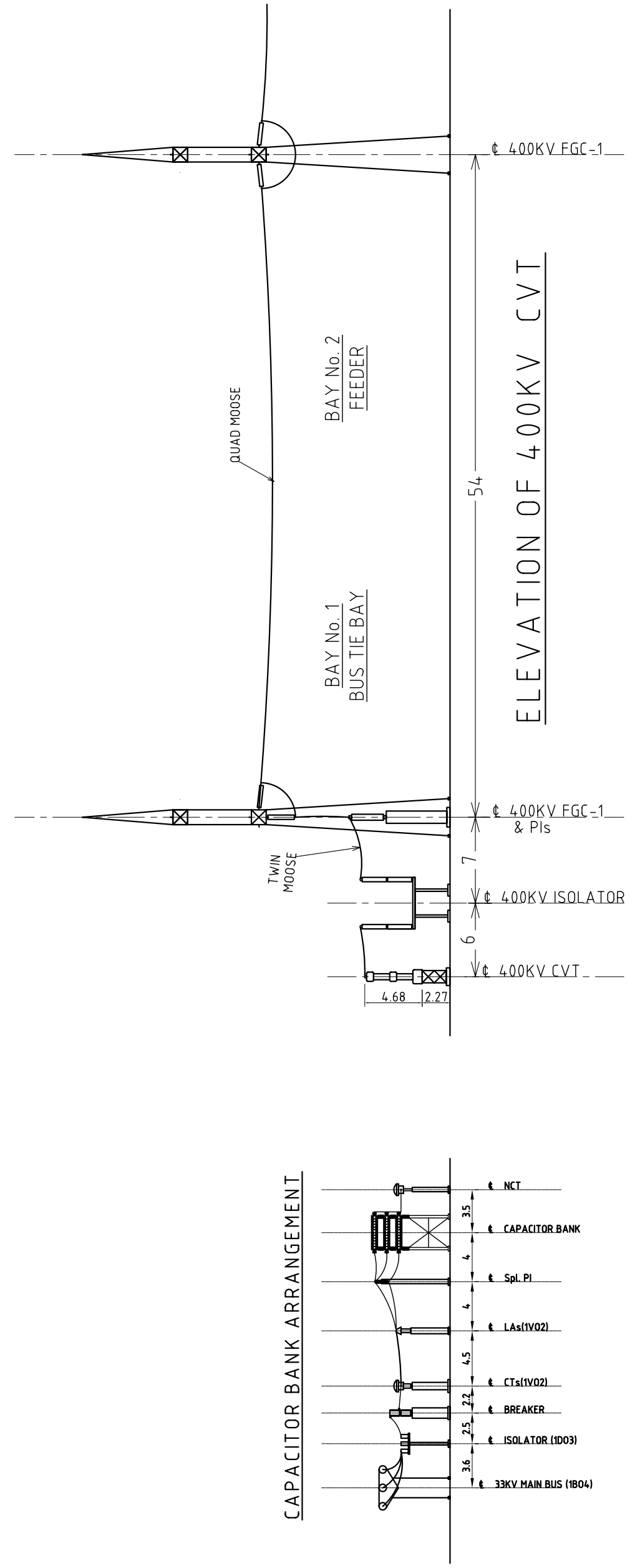
LAYOUT PLAN OF

400/132/33KV SUBSTATION

KIRANAPUR (BALAGHAT)

SCALE: 1:1000
DATE: 20-11-14
DRAWING NO. - XII-NDB-27142
REV: R1

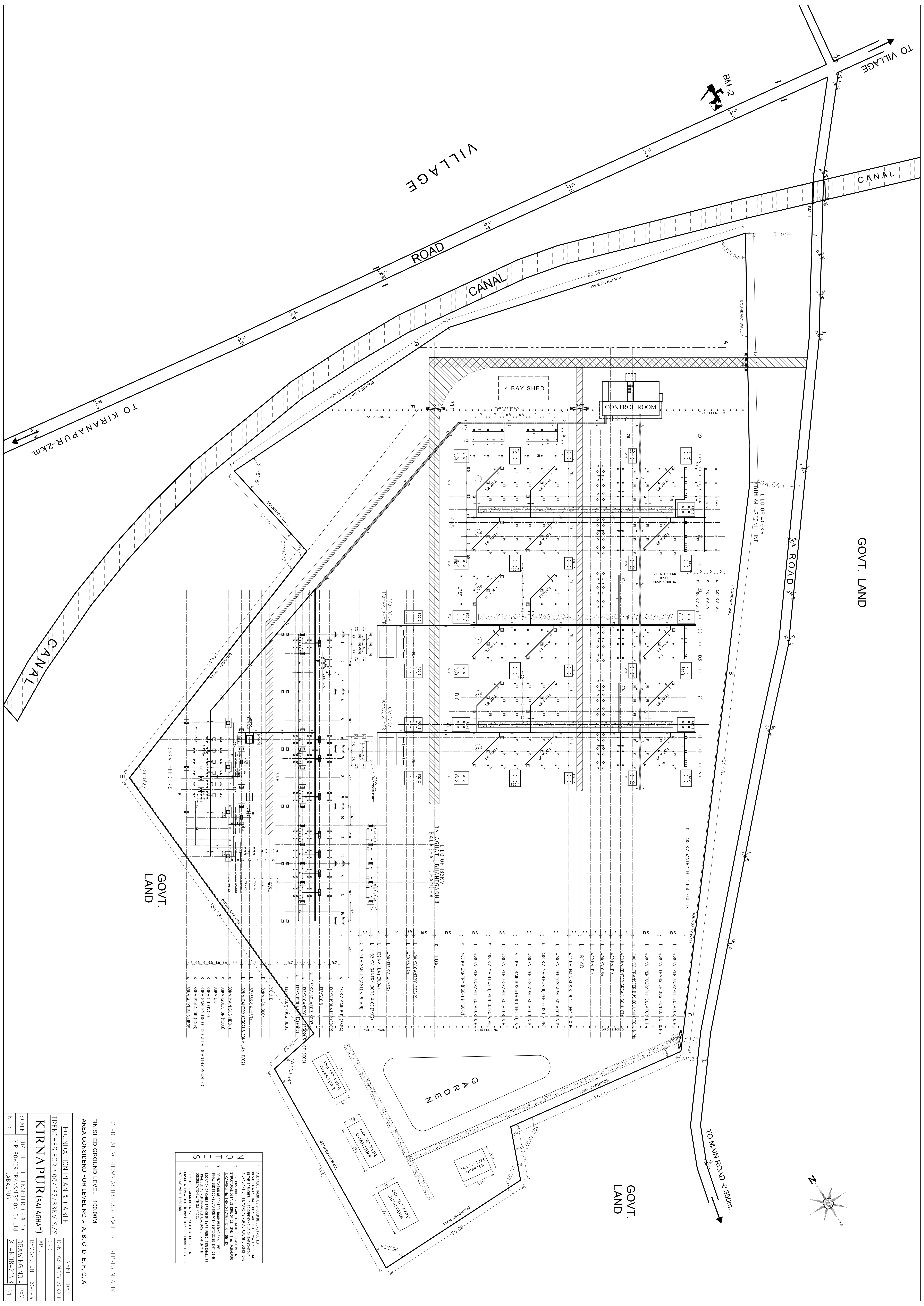
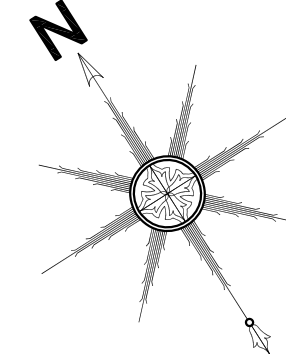
SCALE: 1:1000
DATE: 20-11-14
DRAWING NO. - XII-NDB-27142
REV: R1



RI :-DETAILING SHOWN AS DISCUSSED WITH
BHIL REPRESENTATIVE.

SECTIONAL ELEVATION OF				KIRNAPUR (BALAGHAT)			
400/132/33KV SUBSTATION				DRN.	NAME	DATE	REV
				CKD.	I.G.S. DUBEY	27-09-14	XII-N08-21/5
				APP.			RT.
				REVISED ON	20-11-14		
				SCALE	O/O THE CHIEF ENGINEER (P & D)		
				NT S	M.P. POWER TRANSMISSION Co. Ltd.		
					JABALPUR		

GOVT. LAND

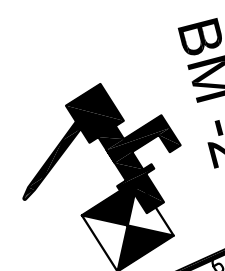
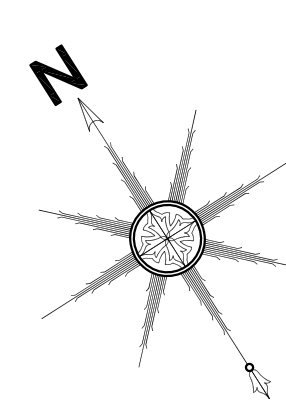


1. ALL CABLE TRENCHES SHOULD BE CONSTRUCTED IN THE TRENCHES. ALSO PROVIDE 30 CM BEDDING & GRAVEL ON THE YARD AS PER ACTUAL SITE CONDITIONS & GRAVEL ON THE YARD AS PER ACTUAL SITE CONDITIONS. DRAWING NO. DN/ST/143/D1/28-08-12
2. THE CONSTRUCTION OF CABLE TRENCHES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWING NO. DN/ST/143/D1/28-08-12
3. THE CONSTRUCTION OF CABLE TRENCHES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWING NO. DN/ST/143/D1/28-08-12
4. THE LOCATION OF CABLE TRENCHES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWING NO. DN/ST/143/D1/28-08-12
5. THE CONSTRUCTION OF CABLE TRENCHES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWING NO. DN/ST/143/D1/28-08-12

FINISHED GROUND LEVEL 100.00M
AREA CONSIDERED FOR LEVELING :- A, B, C, D, E, F, G, A

FOUNDATION PLAN & CABLE TRENCHES FOR 400/132/33KV S/S			KIRNAPUR (BALAGHAT)	
SCALE	O/O THE CHIEF ENGINEER (P & D)			
TS	MP POWER TRANSMISSION Co. Ltd.			
	JABALPUR			
	NAME	DATE	DRN	CKD
			APP	
	REVISED ON	20-11-14		
	DRAWING NO -	REV		
	XII-NDB-2143	R1		

GOVT. LAND



BM-2

CANAL

ROAD
CANAL
VILLAGE

TO KIRANAPUR 2km.

CANAL

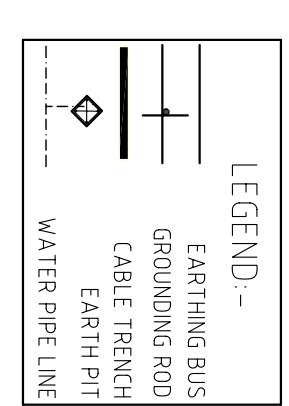
L.I.O OF 400KV
BHILAI - SEONI LINE

ROAD

TO MAIN ROAD 0.360m.

GOVT.
LAND

GOVT.
LAND



- NOTES:-
1. WORKING MS FLAT
 2. 250 300mm LONG
 3. 250 300mm LONG
 4. 250 300mm LONG
 5. 250 300mm LONG
 6. 250 300mm LONG
 7. 250 300mm LONG
 8. 250 300mm LONG
 9. 250 300mm LONG
 10. 250 300mm LONG

FINISHED GROUND LEVEL 100.00M

AREA CONSIDERED FOR LEVELING :- A, B, C, D, E, F, G, A

EARTH MAT ARRANGEMENT OF

KIRNAPUR (BALAGHAT)

SCALE

DRAWING NO. -

REV

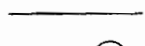
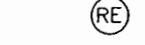
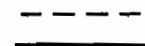
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It must not be used directly or indirectly in anyway detrimental to the interest of the company.

20 SEP 2015

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

ADDITIONAL INFORMATION W.O.No. 86012			400 kV S/s, T/s lines at Balaghat, Badnawar, Bhopal, Chhhegaon and Nagda (Lot no. 1)														
STATUS OF DRAWING DISTRIBUTION OF PRINTS			LOA No. 04-01/ADB-III/MPPTCL/TR501/LOT-1/TK-11/06802-3														
 भारत हेवी इलेक्ट्रिकल्स लिमिटेड ट्रांसमिशन परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION			<table border="1"> <tr> <th>REVISION</th> <th>DATE</th> <th>BY</th> <th>DATE</th> </tr> <tr> <td>1</td> <td>10/06/14</td> <td>SK</td> <td>SK</td> </tr> <tr> <td>2</td> <td></td> <td>RS</td> <td></td> </tr> </table>			REVISION	DATE	BY	DATE	1	10/06/14	SK	SK	2		RS	
REVISION	DATE	BY	DATE														
1	10/06/14	SK	SK														
2		RS															
REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED												
ZONE			ZONE														
प्रमाण टीएम DEPI कोड 422 कोड			जगुपत / SCALE 														
प्रमाण टीएम DEPI कोड 422 कोड			गैर कोड CARD CODE														
प्रमाण टीएम DEPI कोड 422 कोड			EQUIPMENT & STRUCTURE EARTHING DETAILS														
प्रमाण टीएम DEPI कोड 422 कोड			डाटा. नं./DRAWING NO. TB-4-368-318-004														
प्रमाण टीएम DEPI कोड 422 कोड			प्रमाण टीएम SHEET 30														

LEGEND

	CONNECTION TO GROUND MAT THROUGH RISER.
	EARTH MAT (100X12mm MS FLAT)
	TREATED EARTH PIT
	50X6mm MS FLAT
	RISER (75X8mm MS FLAT)

GENERAL NOTES:

1. EARTH STRIP WELDED TO LATTICE TYPE STRUCTURE AT AN INTERVAL OF 1000mm.
2. ALL ELECTRICAL EQUIPMENTS SHALL BE EARTHED BY TWO SEPARATE AND DISTINCT EARTH CONNECTIONS AND SHALL BE CONNECTED TO DIFFERENT CONDUCTORS OF EARTHING GRID.
3. 75X8 mm MS FLAT RISERS SHOULD BE BROUGHT CLOSE TO EQUIPMENTS FOUNDATION.
4. ALL WELDED CONNECTION SHALL BE MADE BY ELECTRIC ARC WELDING.
5. THE MAIN EARTH MAT (100X12 mm MS FLAT) SHALL BE 500mm BELOW FGL.
6. ALL WELDED AND BRAZED JOINTS OF RISER/CONDUCTOR SHALL BE COATED WITH BITUMINOUS PAINT.
7. CABLE RACKS AND SUPPORTS SHALL BE PAINTED AFTER INSTALLATION WITH TWO COATS OF METAL PRIMER (COMPRISING OF RED OXIDE AND ZINC CHROMATE IN A SYNTHETIC MEDIUM) FOLLOWED BY TWO FINISHING COATS OF ALUMINIUM PAINT.
8. EARTHING SHALL BE DONE IN ACCORDANCE WITH IS:3043 UNLESS OTHERWISE AS STATED IN TECHNICAL SPECIFICATION.

SHEET NO. DESCRIPTION

01. LEGEND, NOTES & DESCRIPTION
02. 400KV SF6 CIRCUIT BREAKER
03. 220/132/33KV CIRCUIT BREAKER
04. 400/220KV CVT
05. 132KV COUPLING CAPACITOR
06. 220/132/33KV PT
07. 40KV SURGE CAPACITOR
08. 400/220/132/33KV POST INSULATOR (SOLID CORE TYPE)
09. LIGHTNING ARRESTER (390/198KV)
10. LIGHTNING ARRESTER (120/36/30KV)
11. 400/220/132/33KV CURRENT TRANSFORMER
12. 400KV WAVE TRAP
13. 400KV HCB ISOLATOR (TYPICAL) WITH EARTH SWITCH
14. 400KV PANTOGRAPH ISOLATOR WITH 1 E/S
15. 220/132/33KV HDB ISOLATOR (TYPICAL) WITH EARTH SWITCH

SHEET NO. DESCRIPTION

16. 33KV DROP OUT FUSE
17. BUS SHUNT REACTOR
18. POWER TRANSFORMER
19. LT TRANSFORMER
20. MARSHALLING KIOSK
21. LT SWITCHGEAR / CHARGER / RELAY & CONTROL PANEL
22. TOWER WITH EARTH WIRE
23. TOWER WITHOUT EARTH WIRE
24. FENCE POST
25. CABLE TRENCH
26. TYPICAL ARRANGEMENT OF BOLTED JOINTS
27. RAIL BONDING
28. TREATED EARTH PIT DETAILS
29. WELDING DETAILS
30. WELDING DETAILS

Executive Engineer
O/o Chief Engineer (Procurement) (P&D)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE, EARTHING, DETAILS

LEGEND, NOTES & DESCRIPTION

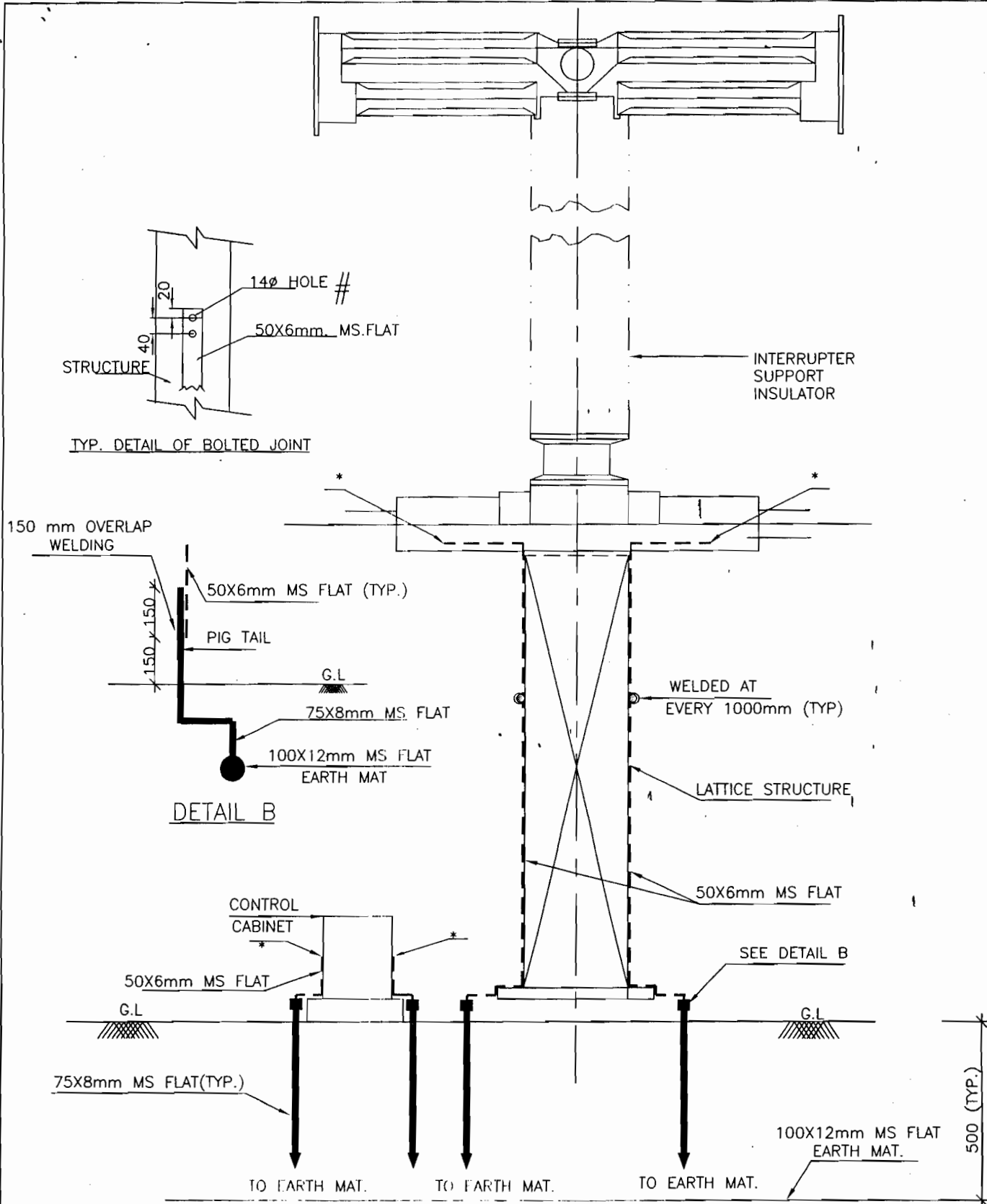
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
01



NOTE:

- 1) # BOLT SIZE AND HOLE SIZE SHALL BE TO SUIT RESPECTIVE EQPT./STRUCTURE.
- 2) NO. OF RISERS PER CIRCUIT BREAKER = 2 NOS./PHASE
- 3) NO. OF RISERS FOR CONTROL CABINET = 2 NOS.
- 4) * BOLTED JOINTS

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS 400kV SF6 CIRCUIT BREAKER

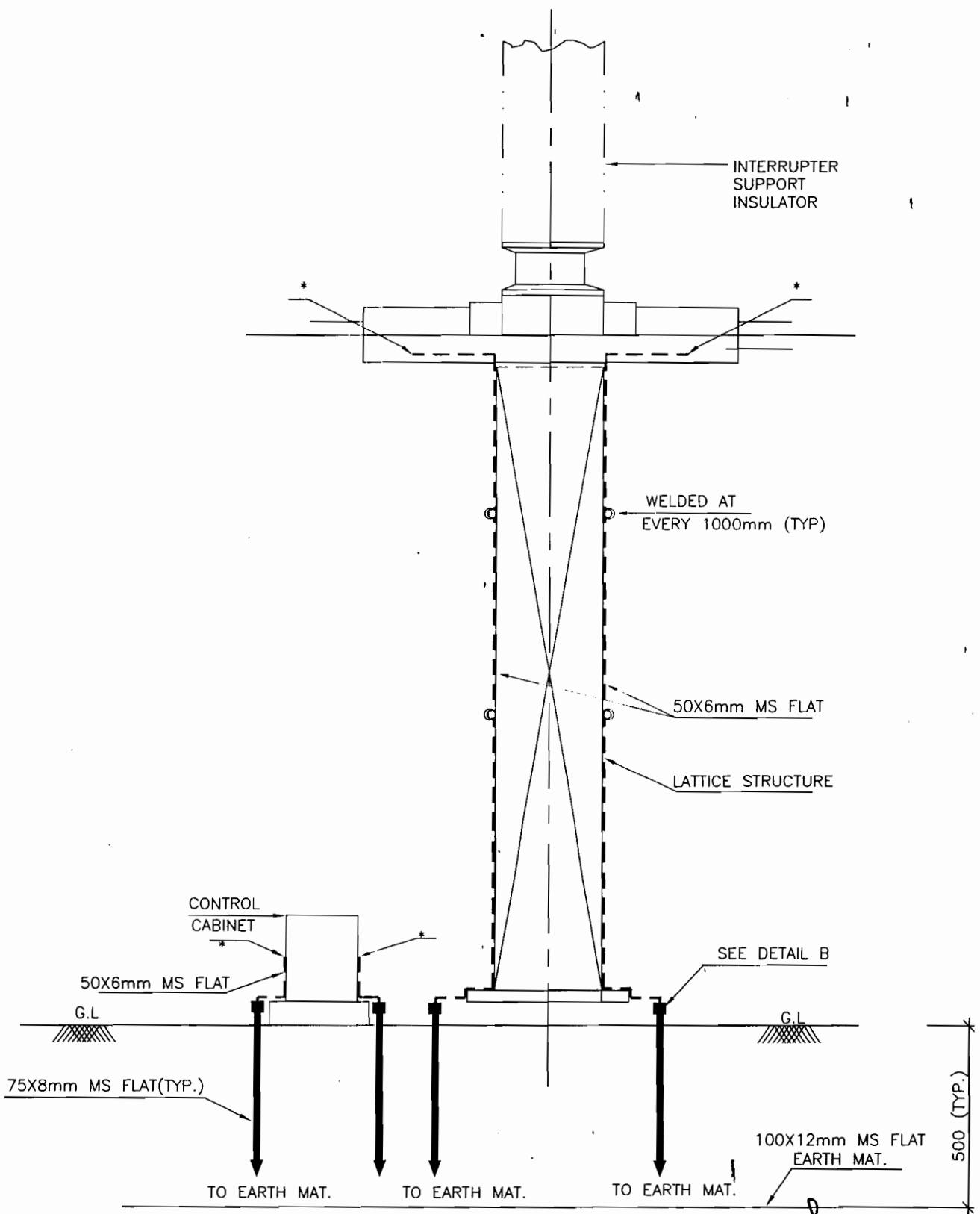
COMPUTER REF. NO.

DRG. No.

TB--4--368--316--004

REV. 00

SHEET No.
2



NOTE:

- 1) NO. OF RISERS PER CIRCUIT BREAKER = 2 NOS./PHASE
- 2) NO. OF RISERS FOR CONTROL CABINET = 2 NOS.
- 3) * BOLTED JOINTS

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS 220/132/33kV CIRCUIT BREAKER

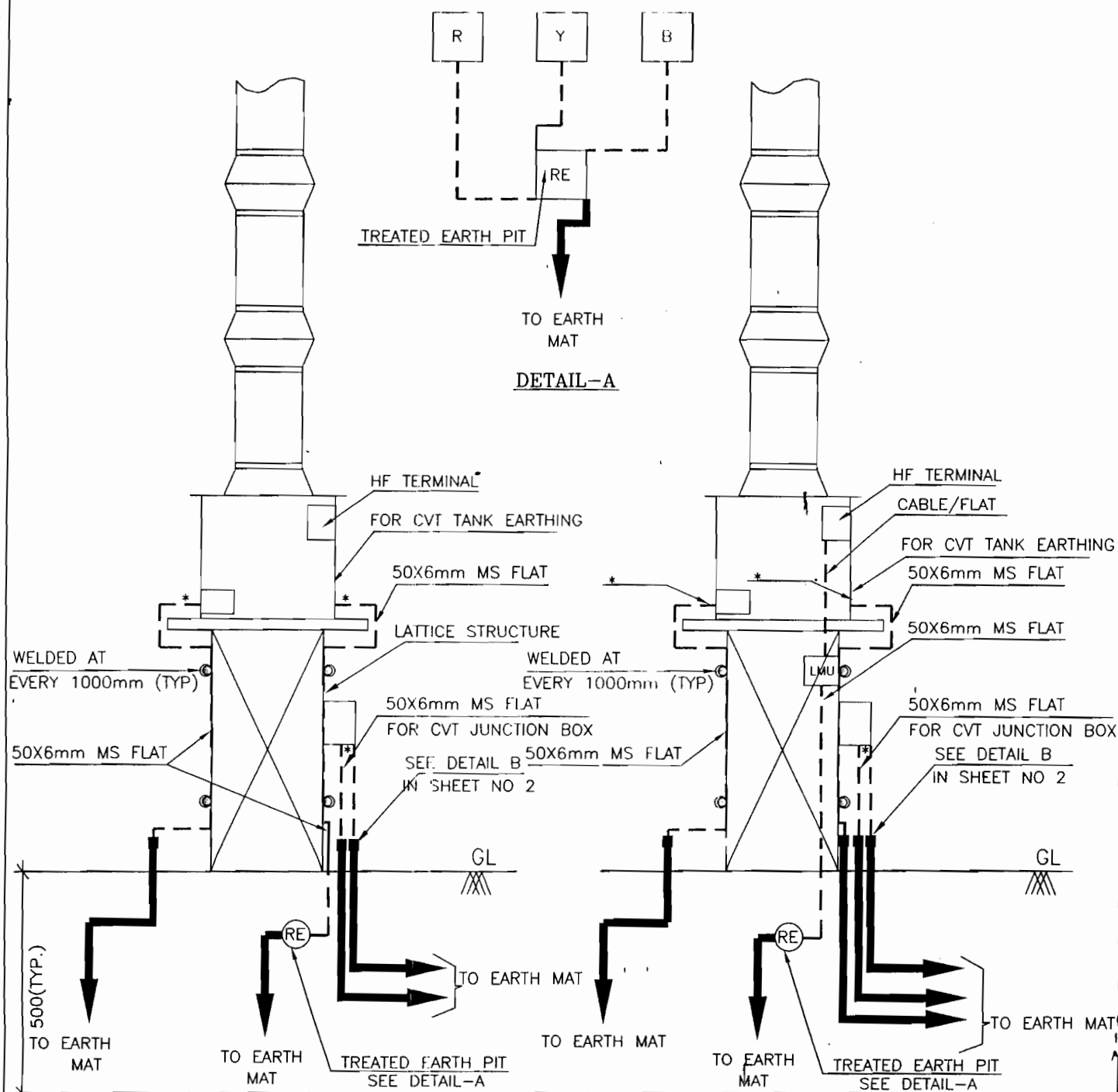
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
3



(CVT WITHOUT LINE MATCHING UNIT CONNECTION)

(CVT WITH LINE MATCHING UNIT CONNECTION)

NOTE:

- (1) 1 NO. TREATED EARTH PIT SHALL BE PROVIDED FOR 3 PH. OF CVT.
- (2) NO. OF RISERS = 1 NOS PER PHASE FOR CVT WITHOUT LMU.
- (3) NO. OF RISERS = 2 NOS PER PHASE FOR CVT WITH LMU.
- (4) NO. OF RISERS FOR CVT JUNCTION BOX = 2 NOS.
- (5) NO. OF RISERS FOR TREATED EARTH PIT = 1 NO.
- (6) * BOLTED JOINTS

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

400/220KV CVT

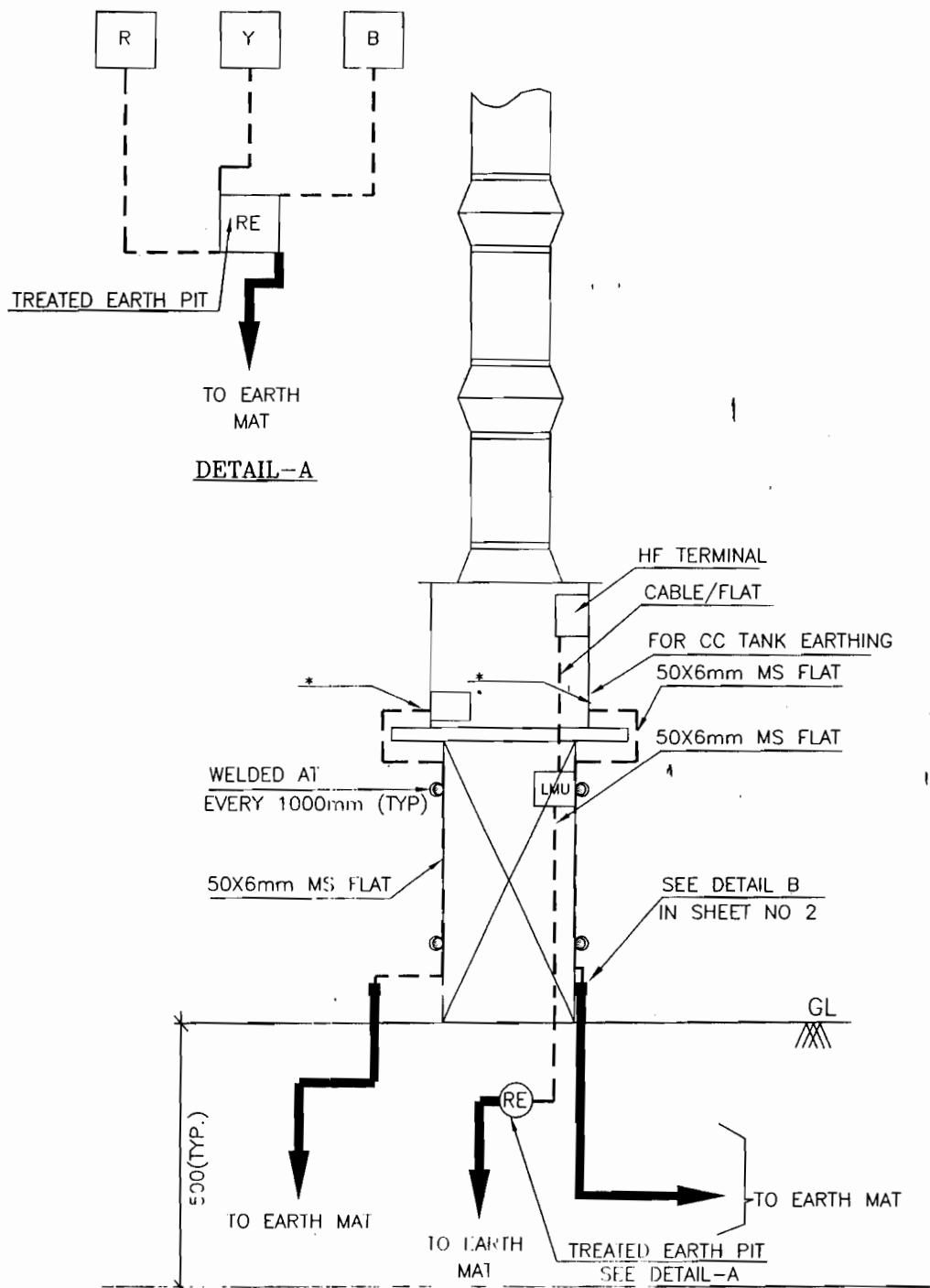
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
4



NOTE:

- (1) 1 NO. TREATED EARTH PIT SHALL BE PROVIDED FOR 3 P.H. OF CC.
- (2) NO. OF RISERS = 2 NOS PER PHASE FOR CC WITH LMU.
- (3) NO. OF RISERS FOR TREATED EARTH PIT = 1 NO.
- (4) * BOLTED JOINTS


Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

132KV COUPLING CAPACITOR

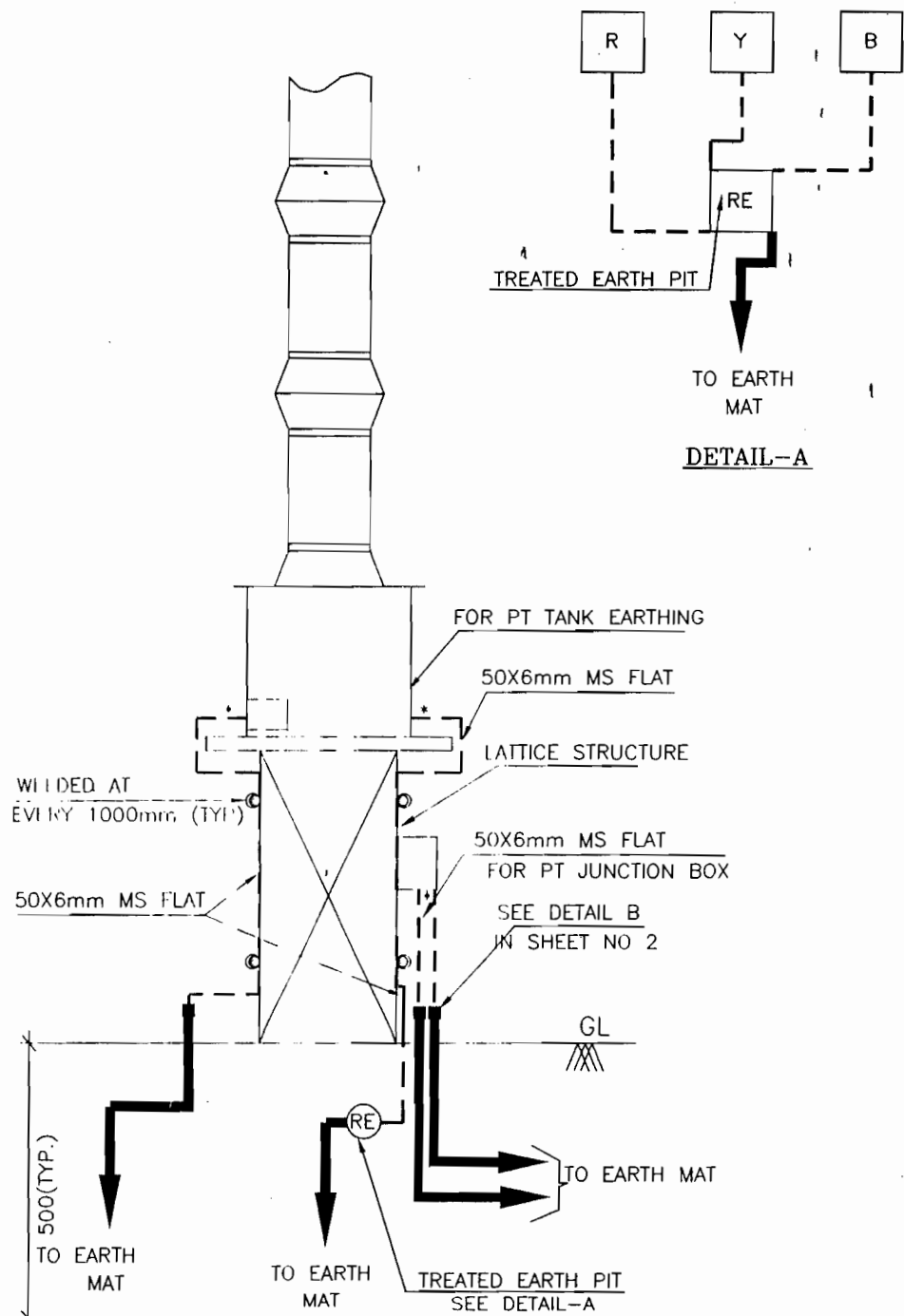
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
5



NOTE:

- (1) 1 NO. TREATED EARTH PIT SHALL BE PROVIDED FOR 3 PH. OF PT.
- (2) NO. OF RISERS = 1 NOS PER PHASE FOR PT
- (3) NO. OF RISERS FOR PT JUNCTION BOX = 2 NOS.
- (4) NO. OF RISERS FOR TREATED EARTH PIT = 1 NO.
- (5) * BOLTED JOINTS

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

220/132/33KV PT

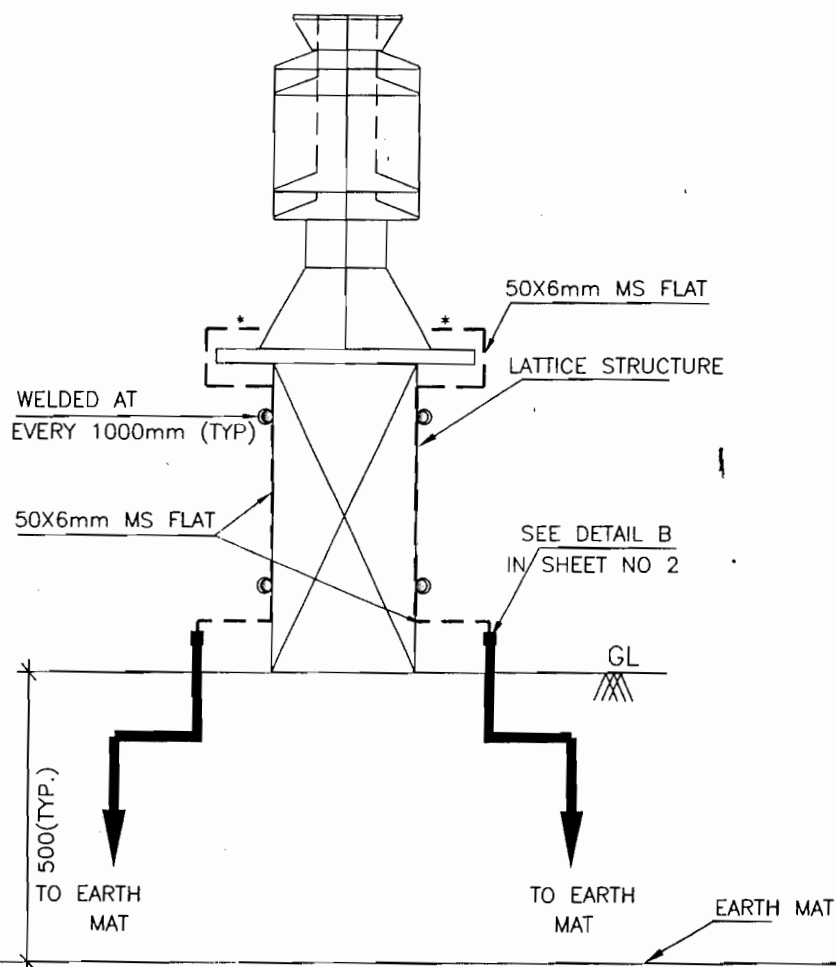
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
6



NOTE:

- (1) NO. OF RISERS = 2 NOS PER PHASE FOR SURGE CAPACITOR
- (2) * BOLTED JOINTS

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS 40KV SURGE CAPACITOR

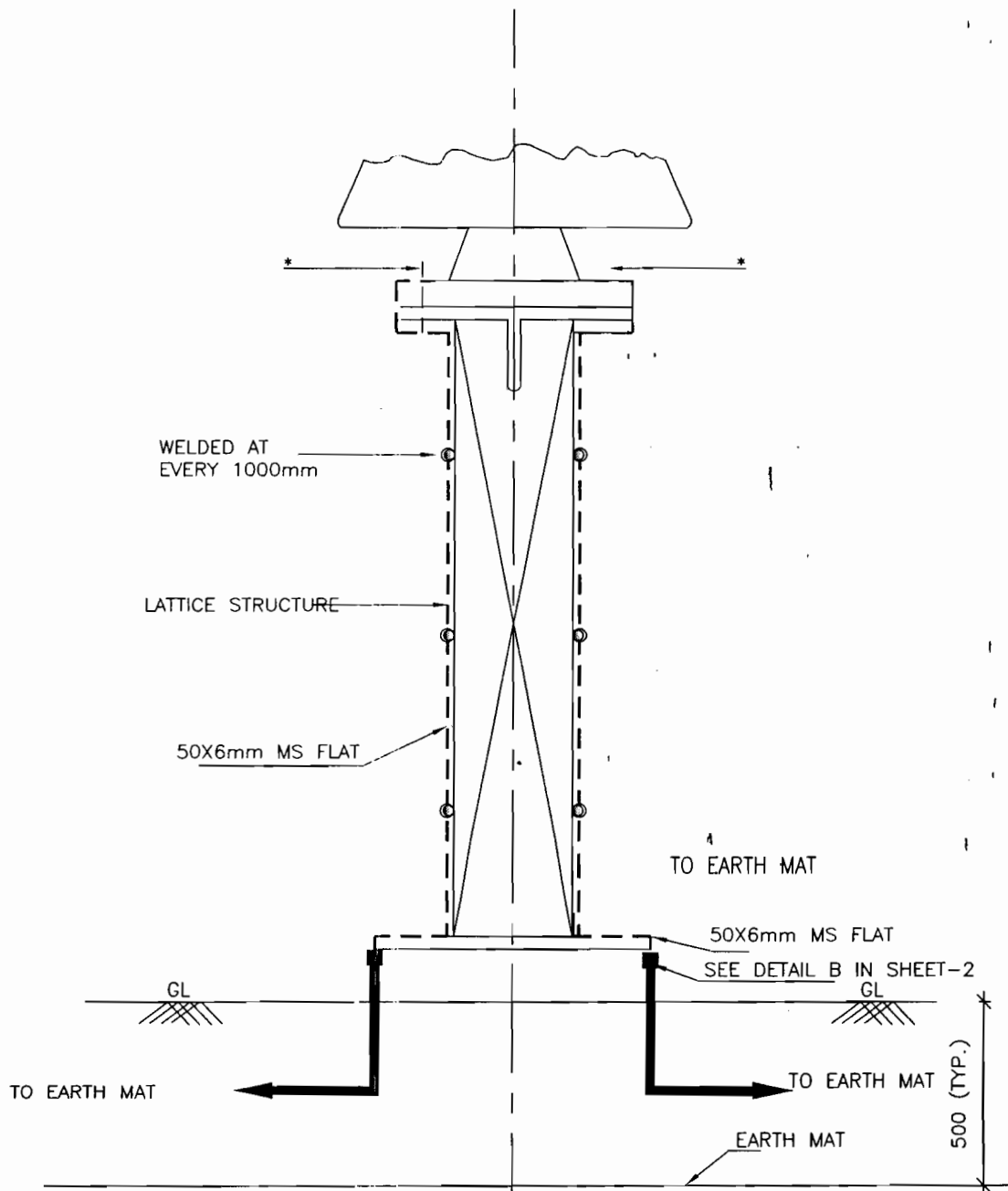
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
7



NOTE:

- (1) NO. OF RISERS :: 2 NOS./PHASE
- (2) * BOLTED JOINTS.

(Signature)
Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR

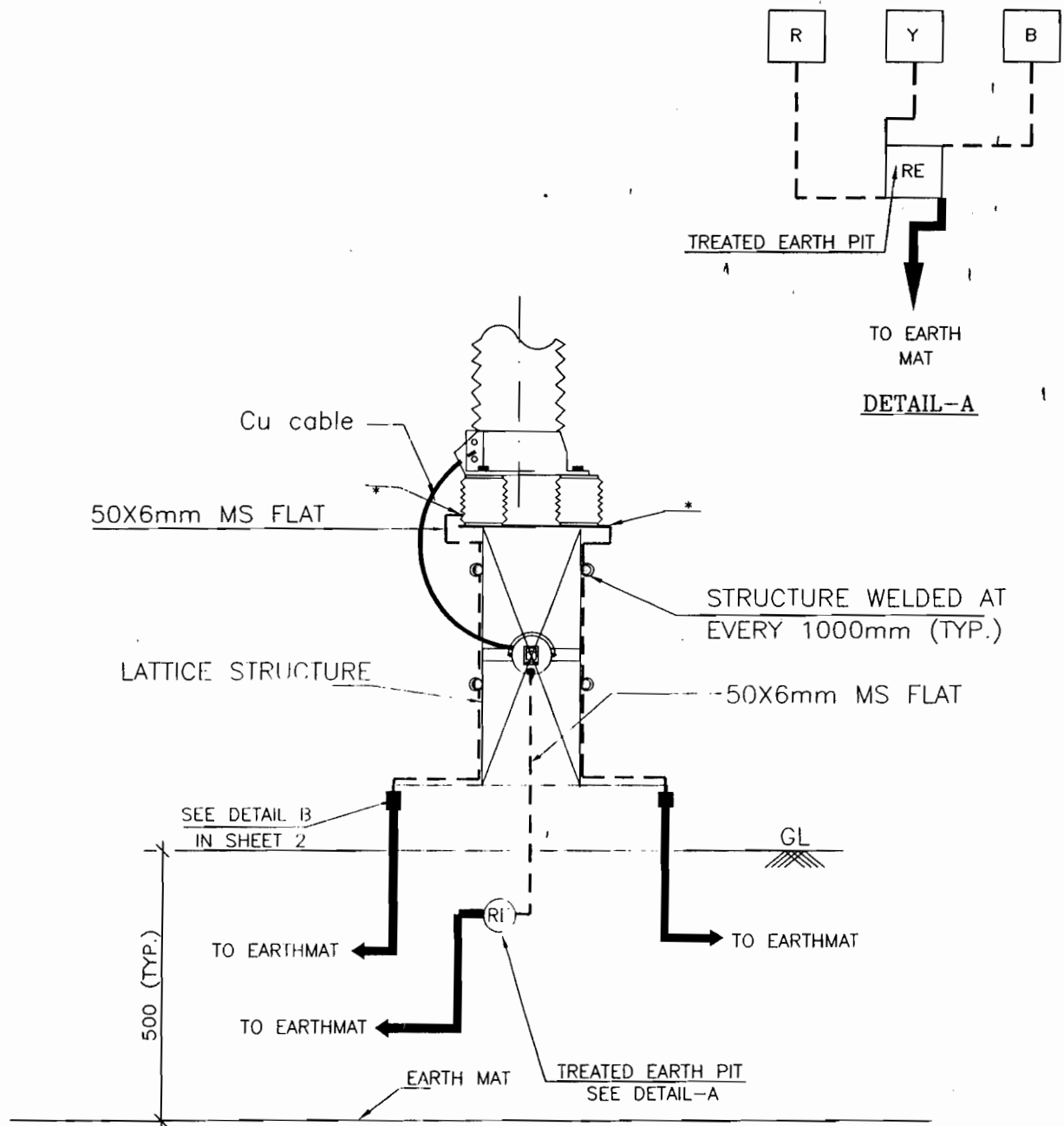


EQUIPMENT & STRUCTURE EARTHING DETAILS 400/220/132/33KV POST INSULATOR (SOLID CORE TYPE)

DRG. No. TB-4-368-316-004

REV. 00

SHEET No. 8



NOTES;

1. LA SHALL BE EARTHED THROUGH EARTH TERMINAL OF SURGE COUNTER
2. 1 NO. TREATED EARTH PIT SHALL BE PROVIDED FOR 3 PH. OF LA.
3. * BOLTED JOINTS.
4. NO. OF RISERS= 2 NOS. PER PHASE
5. NO. OF RISERS FOR TREATED EARTH PIT =1 NO.

[Signature]
 Executive Engineer (P&D)
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS LIGHTNING ARRESTER(390/198kv)

COMPU. DRG. REF.

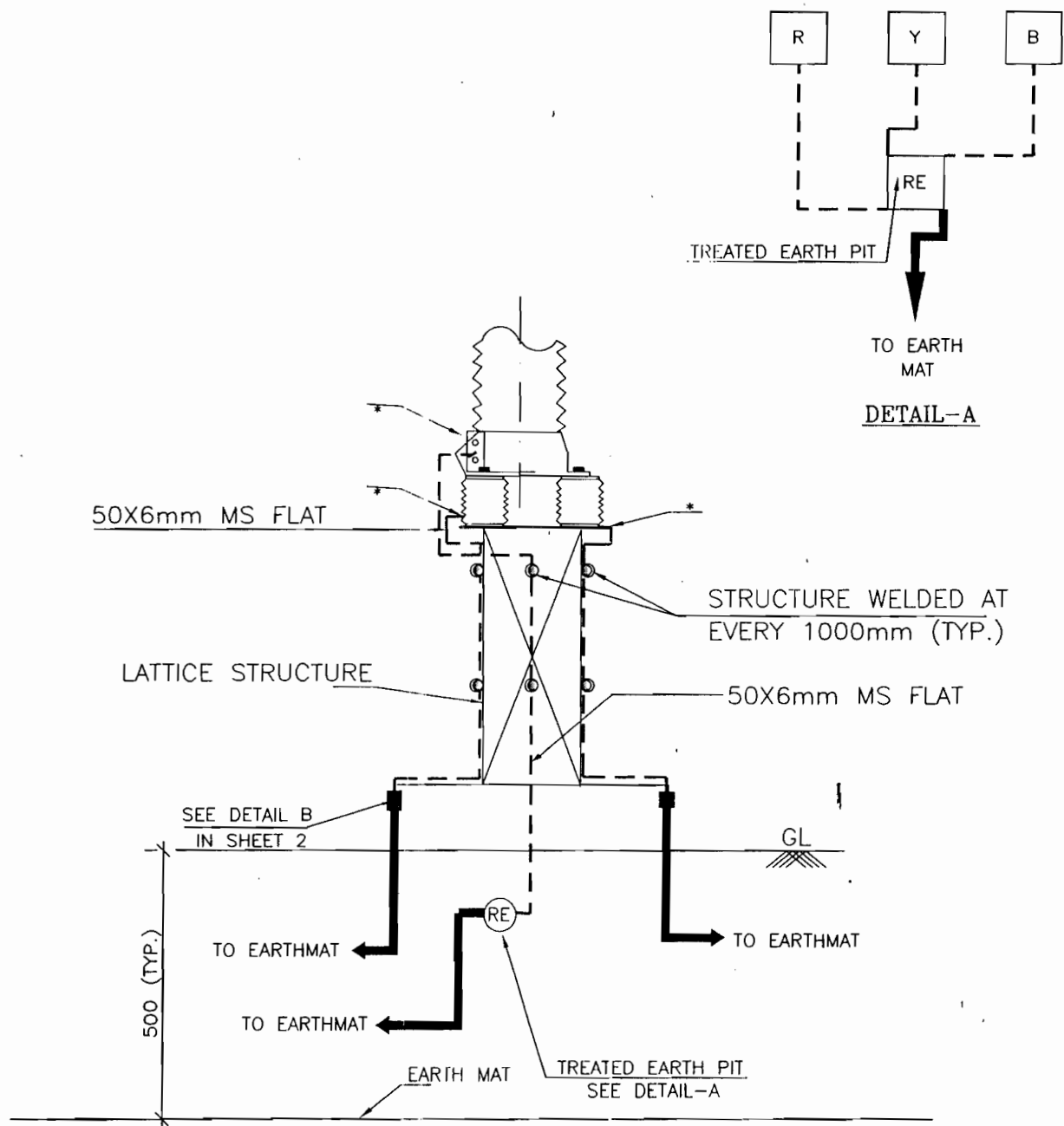
DRG.NO.

TB--4--368--316--004

REV. 00

SHEET No.

9



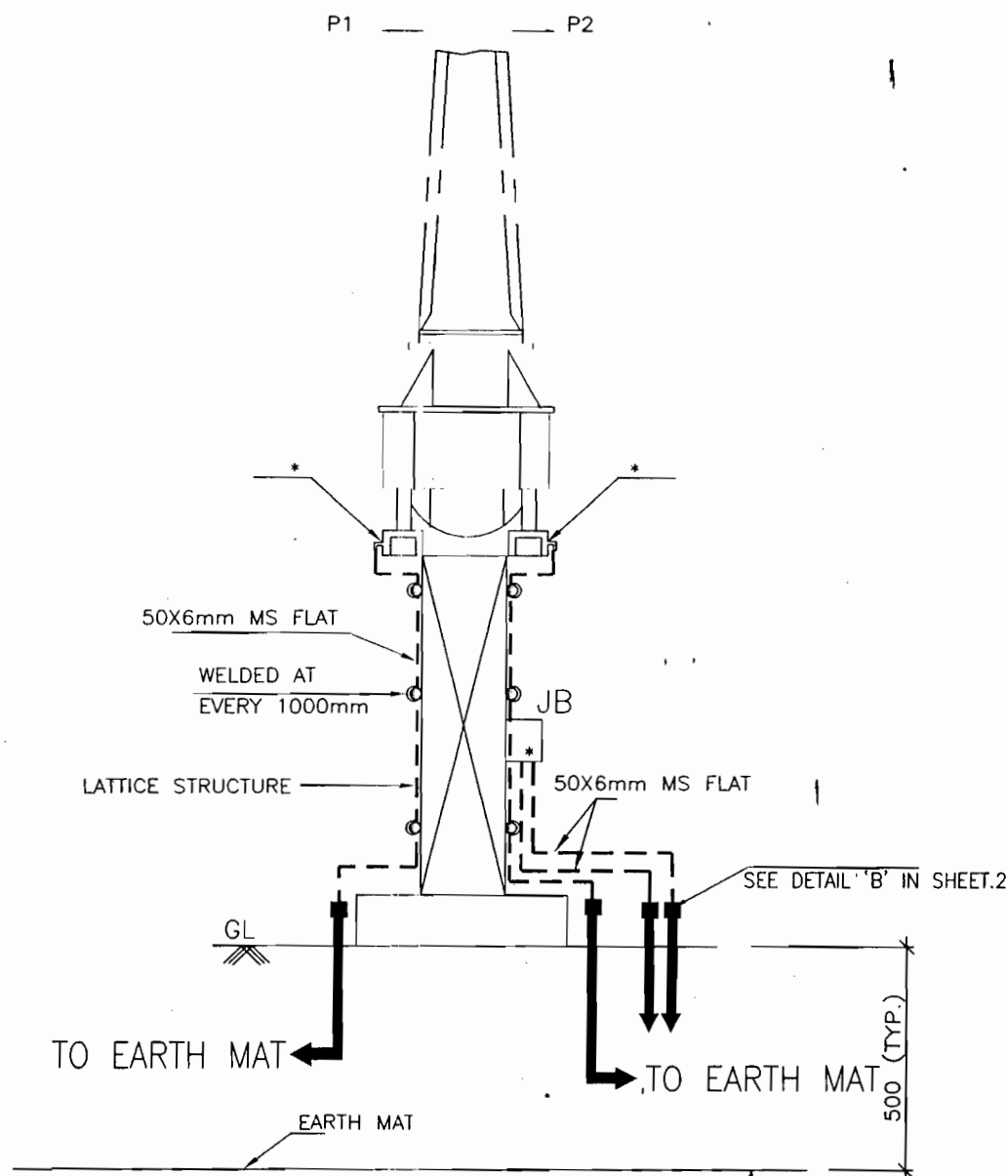
NOTES;

1. 1 NO. TREATED EARTH PIT SHALL BE PROVIDED FOR 3 PH. OF LA.
2. * BOLTED JOINTS.
3. NO. OF RISERS= 2 NOS. PER PHASE
4. NO. OF RISERS FOR TREATED EARTH PIT =1 NO.

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS LIGHTNING ARRESTER(120/36/30kV)



NOTE:

1. NO. OF RISERS=2 NOS./PHASE
2. NO. OF RISERS FOR JUNCTION BOX=2 NOS.
3. * BOLTED JOINTS.


 Executive Engineer (P&D)
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

400/220/132/3.3KV CURRENT TRANSFORMER

COMPU. DRG. REF.

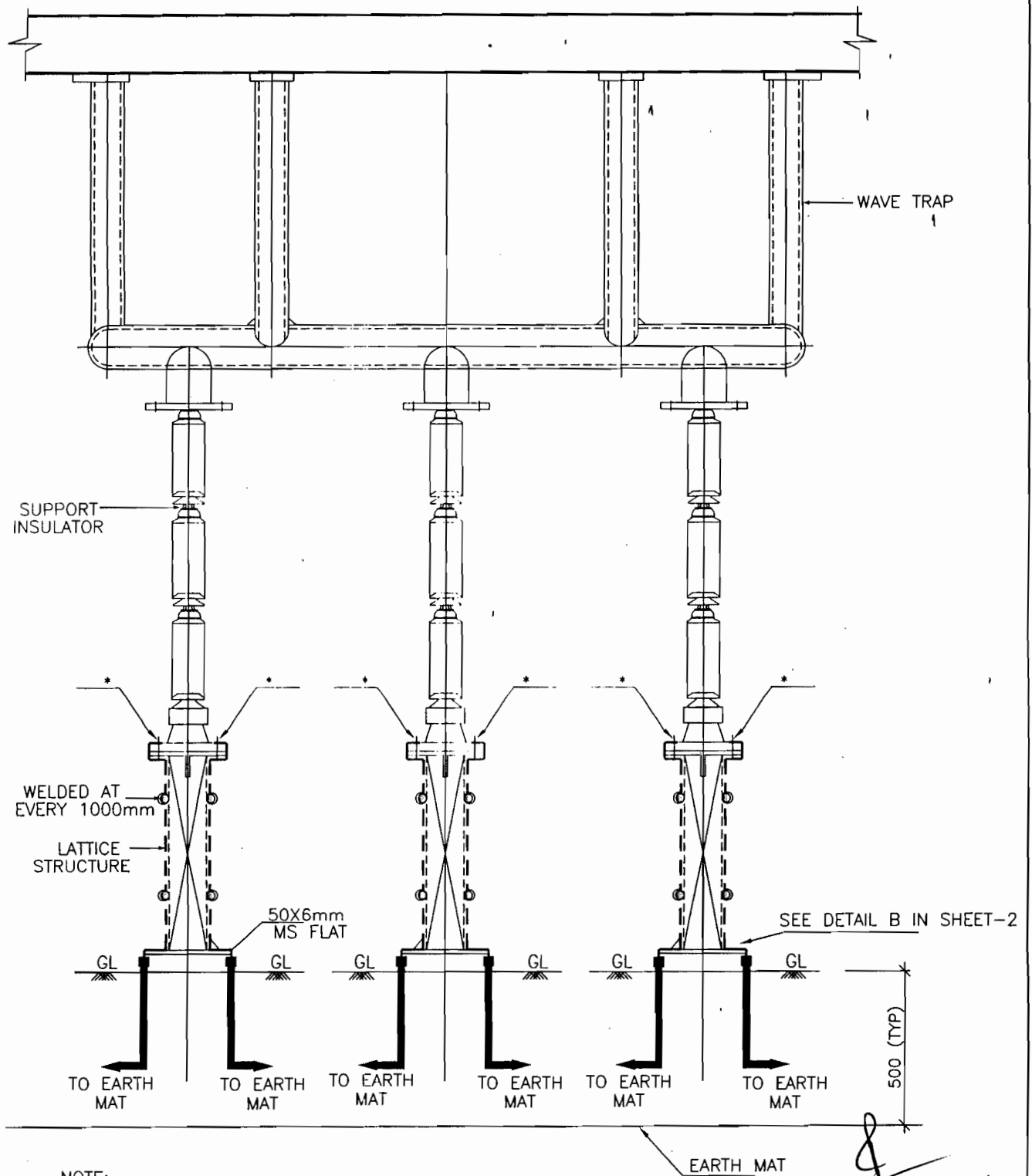
DRG.NO.

TB-4-368-316-004

REV. 00

SHEET No.

11



NOTE:

1. NO. OF RISERS : 6 NOS. PER PHASE.
2. * BOLTED JOINTS.

Executive Engineer (P&D)
 b/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS 400kV WAVE TRAP

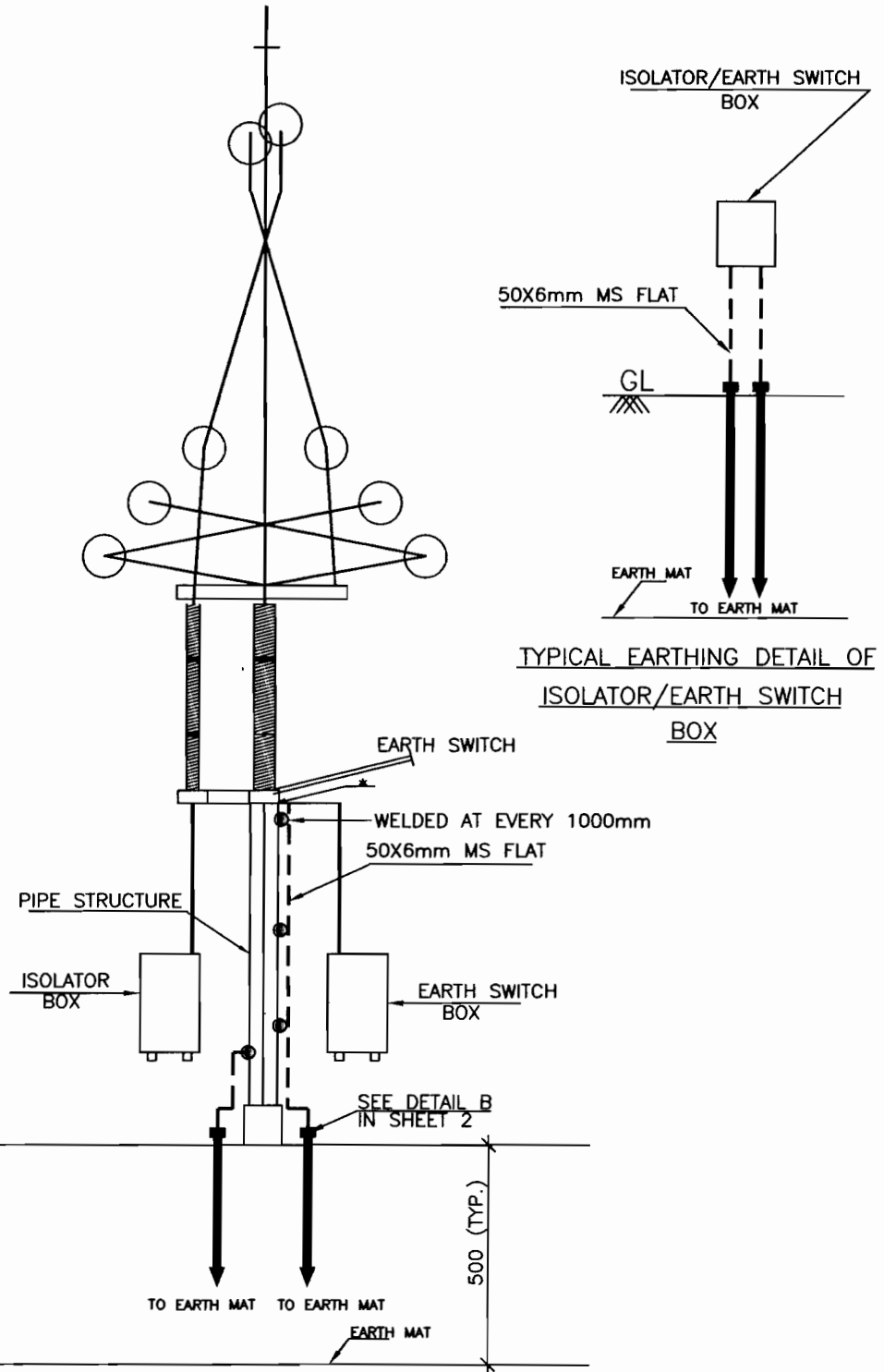
COMPUTER REF. NO.

DRG. No.

TB-4-368-316--004

REV. 00

SHEET No.
 12



NOTES

1. NO. OF RISERS FOR ISOLATOR = 2 NOS./PHASE
2. NO. OF RISERS FOR MAIN ISOLATOR MECHANISM BOX = 2 NOS.
3. NO. OF RISERS FOR EARTH SWITCH MECHANISM BOX = 2 NOS.
4. * BOLTED JOINTS.

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT EARTHING DETAILS

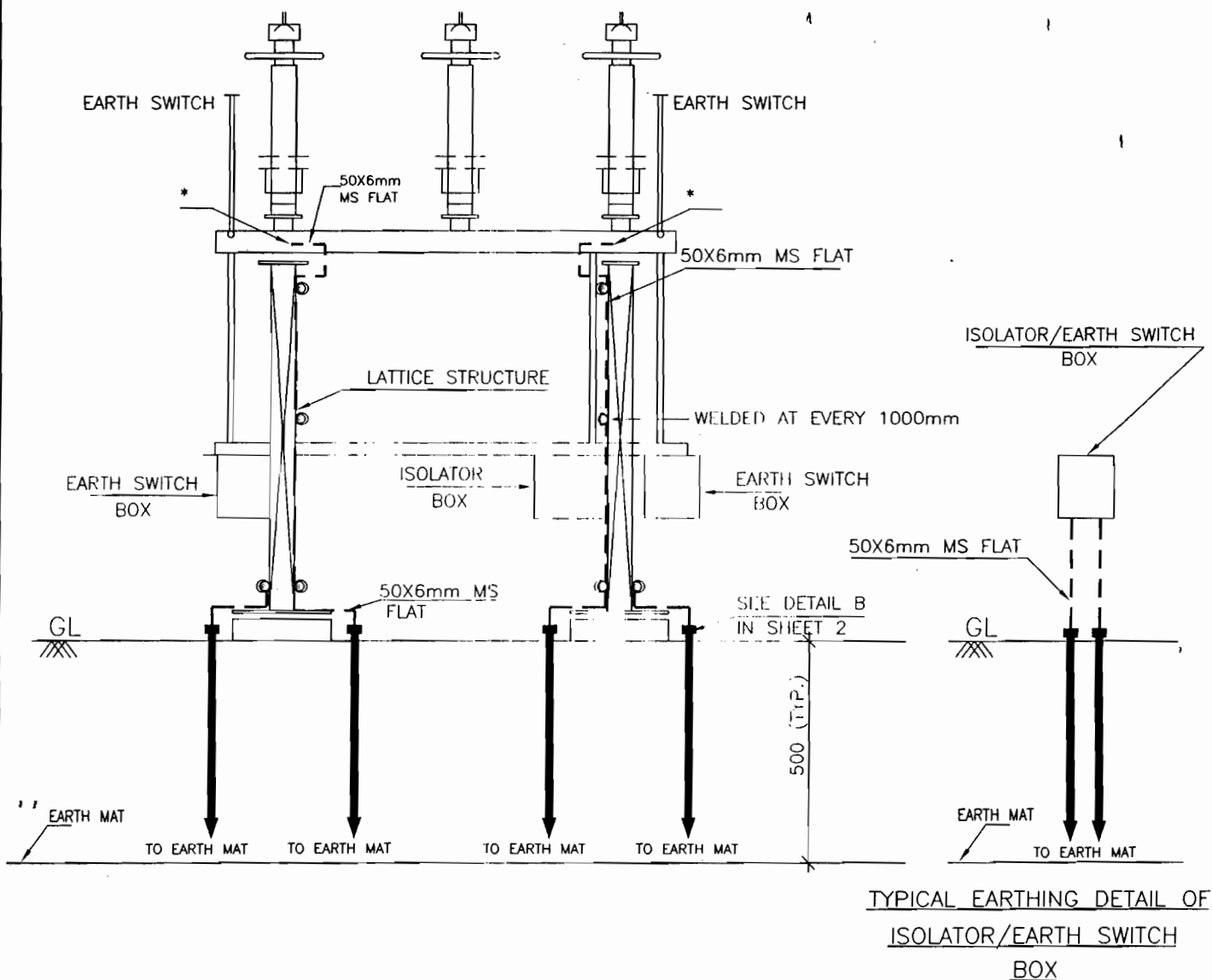
400KV PANTOGRAPH ISOLATOR WITH 1 E/S

COMPUTER REF. NO.

DRG. No. TB-4-368-316-004

REV. 00

SHEET No.
14



NOTES

1. NO. OF RISERS FOR 220/132kV ISOLATOR = 4 NOS./PHASE
2. NO. OF RISERS FOR 33kV ISOLATOR = 4 NOS./THREE PHASE
3. NO. OF RISERS FOR MAIN ISOLATOR MECHANISM BOX = 2 NOS.
4. NO. OF RISERS FOR EARTH SWITCH MECHANISM BOX = 2 NOS.
5. * BOLTED JOINTS.


 Executive Engineer (P&D)
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

220/132/33KV HDB ISOLATOR (TYPICAL) WITH EARTH SWITCH

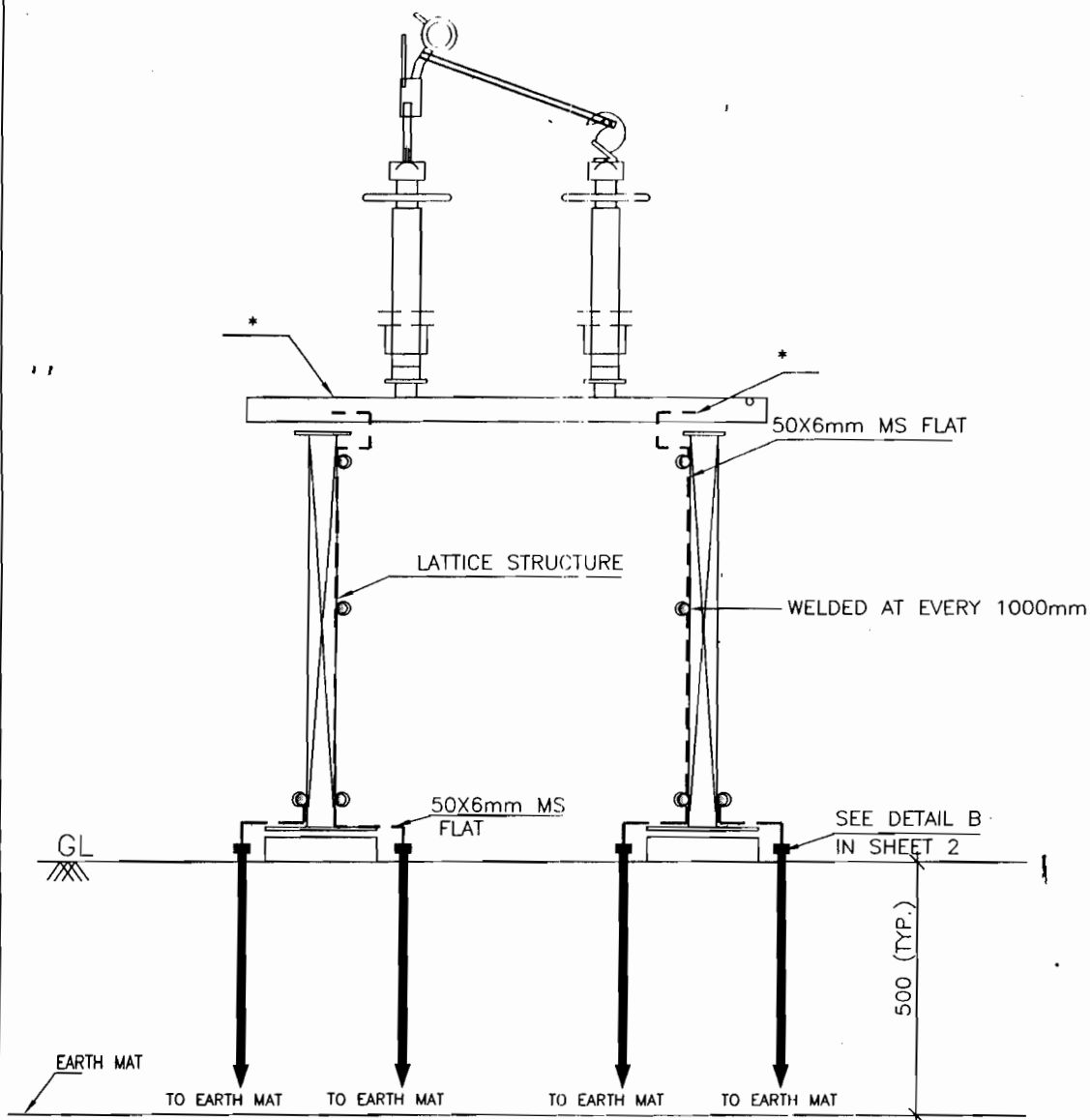
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
15



NOTES

1. NO. OF RISERS FOR 33KV DROP OUT FUSE = '4' NOS./THREE PHASE
2. * BOLTED JOINTS.


 Executive Engineer (P&D)
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

33KV DROP OUT FUSE

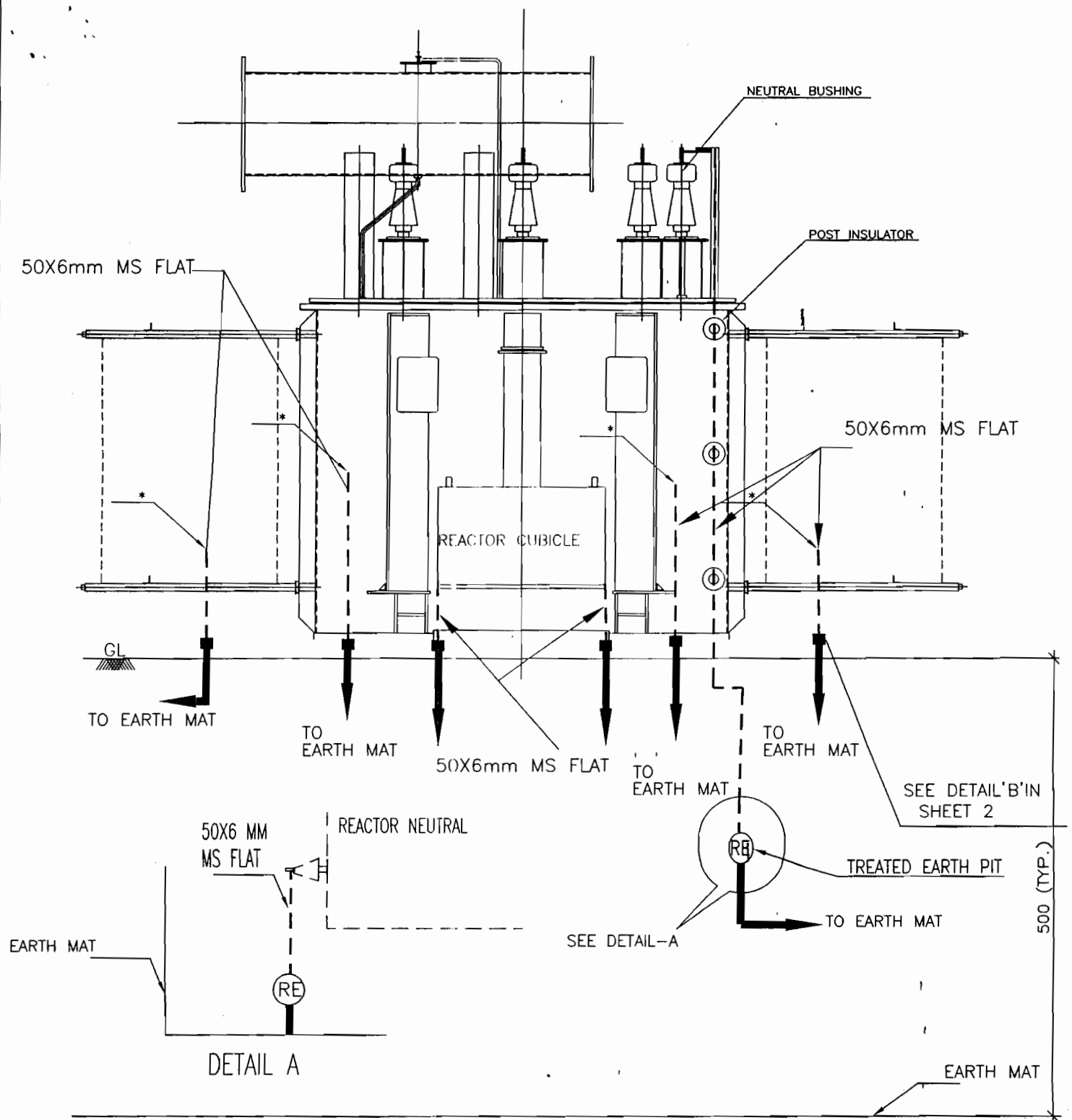
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DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
16



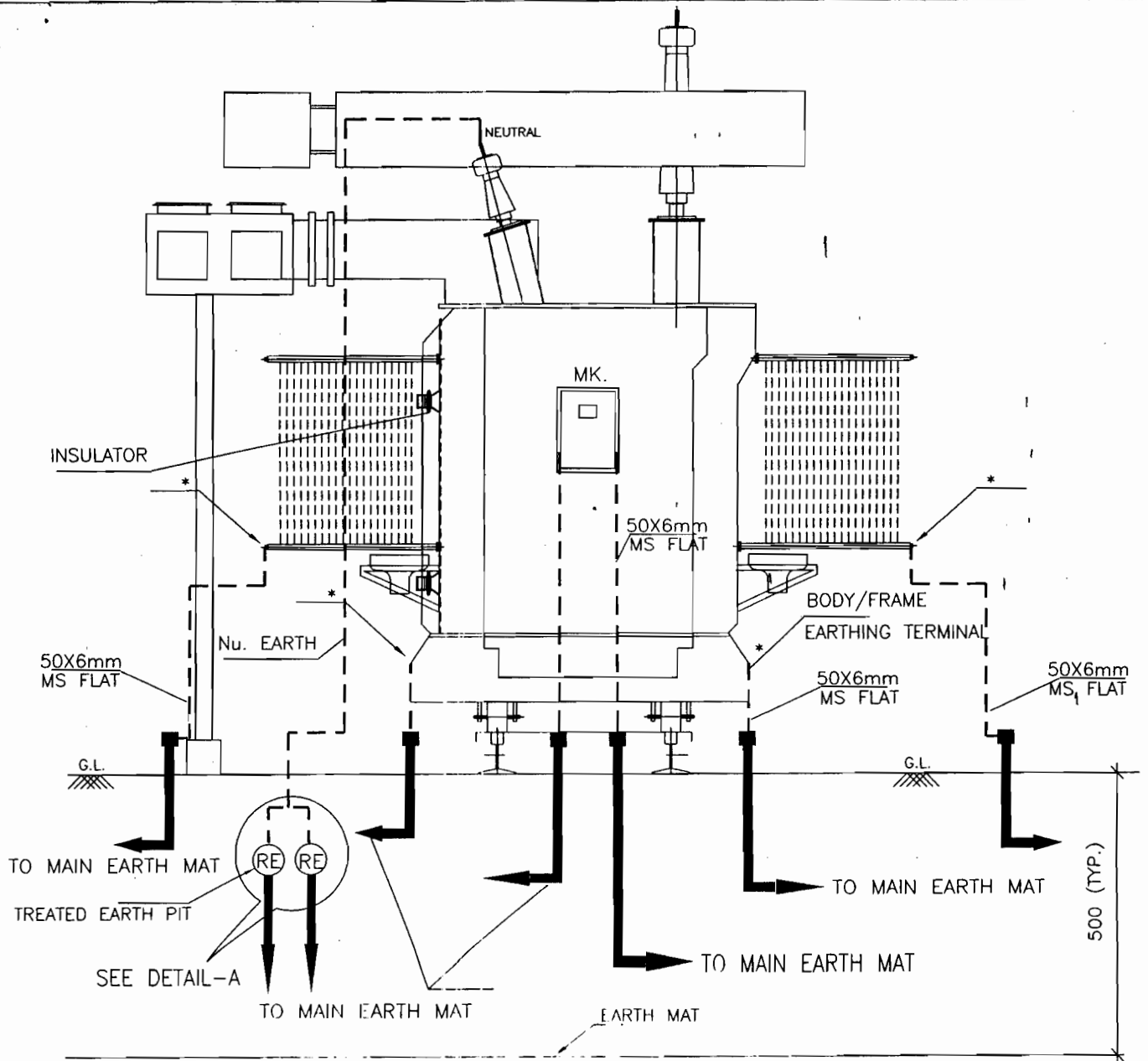
NOTE:

1. NO. OF RISERS FOR MAIN TANK = 2 NOS.
2. NO. OF RISERS FOR TREATED EARTH PIT = 1 NO.
3. NO. OF RISERS FOR RADIATOR = 2 NOS.
4. * BOLTED JOINTS.
5. NO. OF RISER FOR REACTOR CUBICLE=2 NOS.

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR

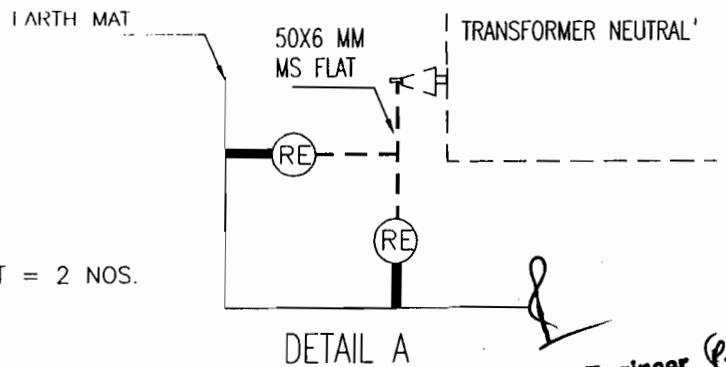


EQUIPMENT & STRUCTURE EARTHING DETAILS
BUS SHUNT REACTOR



NOTE:

1. NO. OF RISERS FOR MAIN TANK = 2 NOS.
2. NO. OF RISERS FOR 2 NOS. TREATED EARTH PIT = 2 NOS.
3. NO. OF RISERS FOR RADIATOR = 2 NOS.
4. * BOLTED JOINTS.
5. NO. OF RISER FOR MK OF TRANSFORMER=2 NOS.



Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



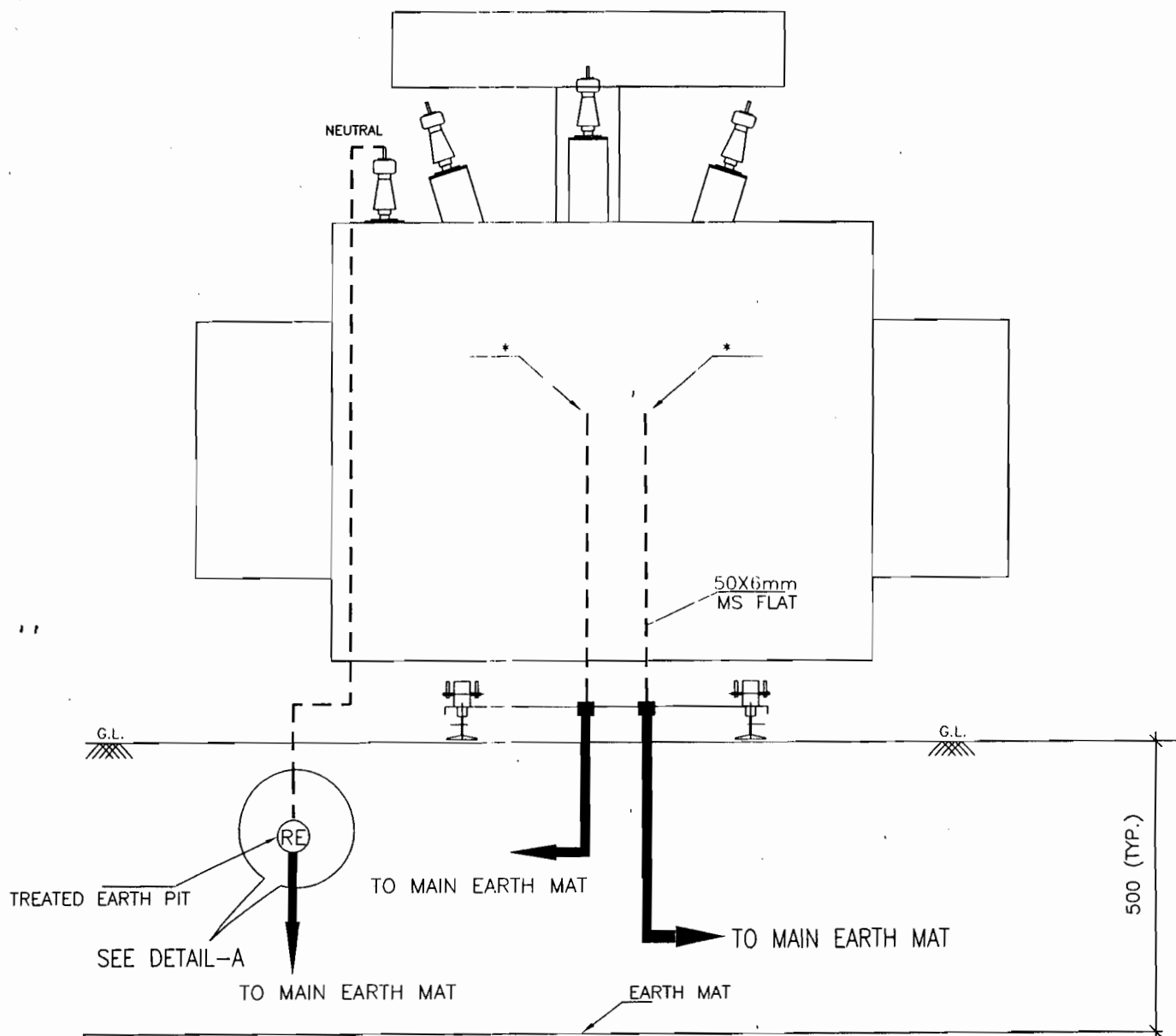
EQUIPMENT EARTHING DETAILS POWER TRANSFORMER

DRG. No.

TB-4-368-316-004.

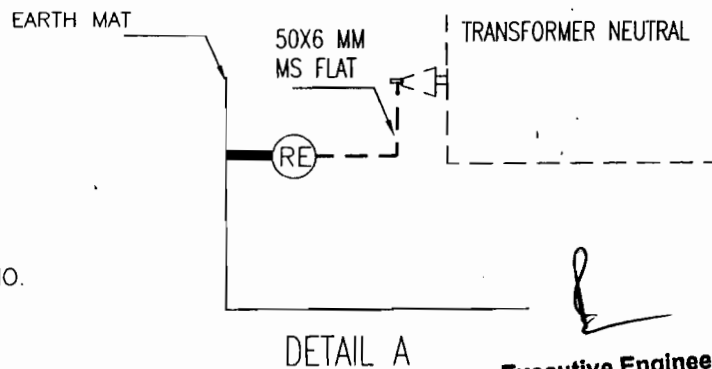
REV. 00

SHEET No.
18



NOTE:

1. NO. OF RISERS FOR MAIN TANK = 2 NOS.
2. NO. OF RISERS FOR TREATED EARTH PIT = 1 NO.
3. * BOLTED JOINTS.



Executive Engineer (P&M)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



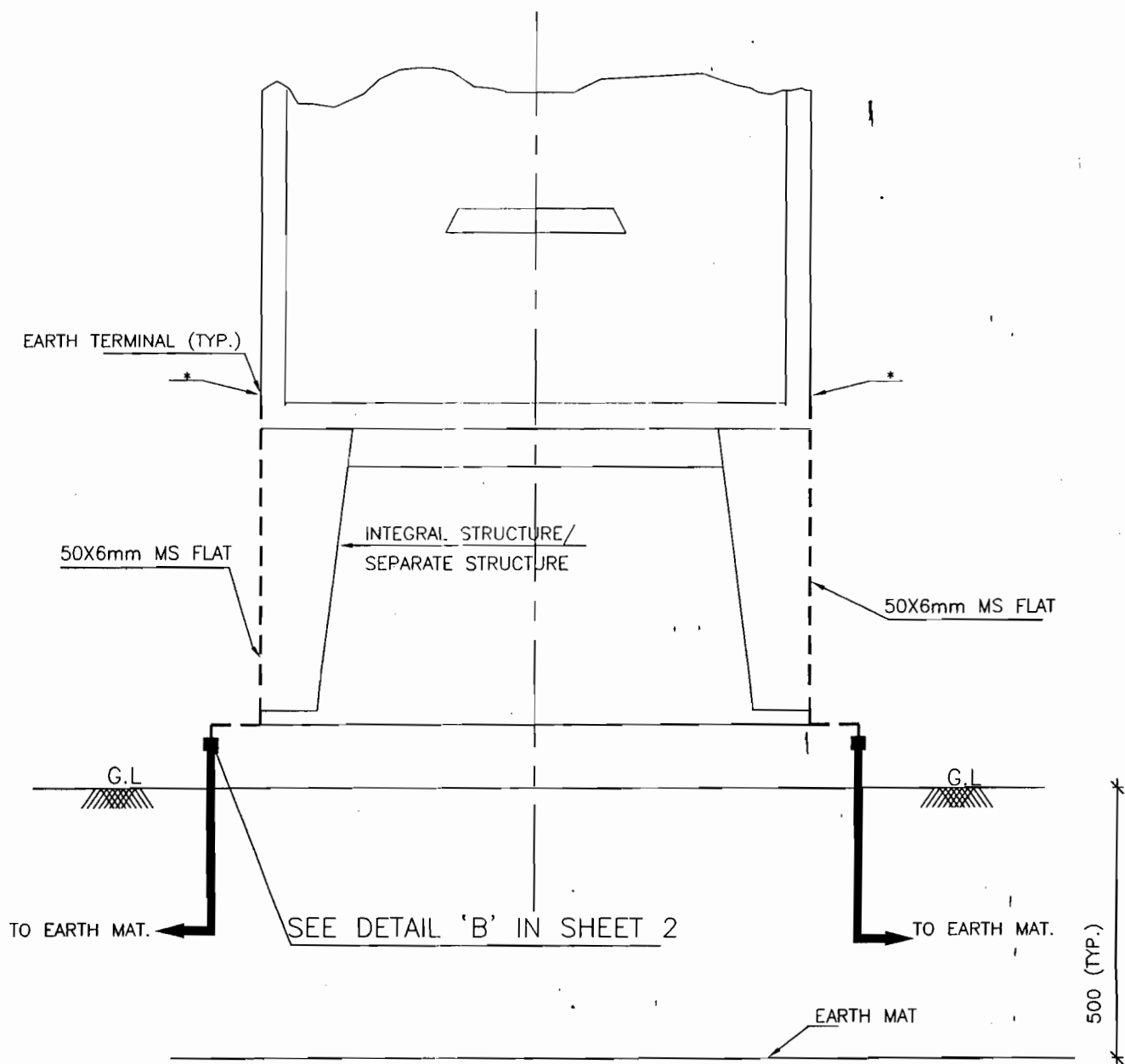
EQUIPMENT EARTHING DETAILS LT TRANSFORMER

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
19



NOTES;

1. NO. OF RISERS= 2NOS.
2. * BOLTED JOINTS.

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS MARSHALLING KIOSK

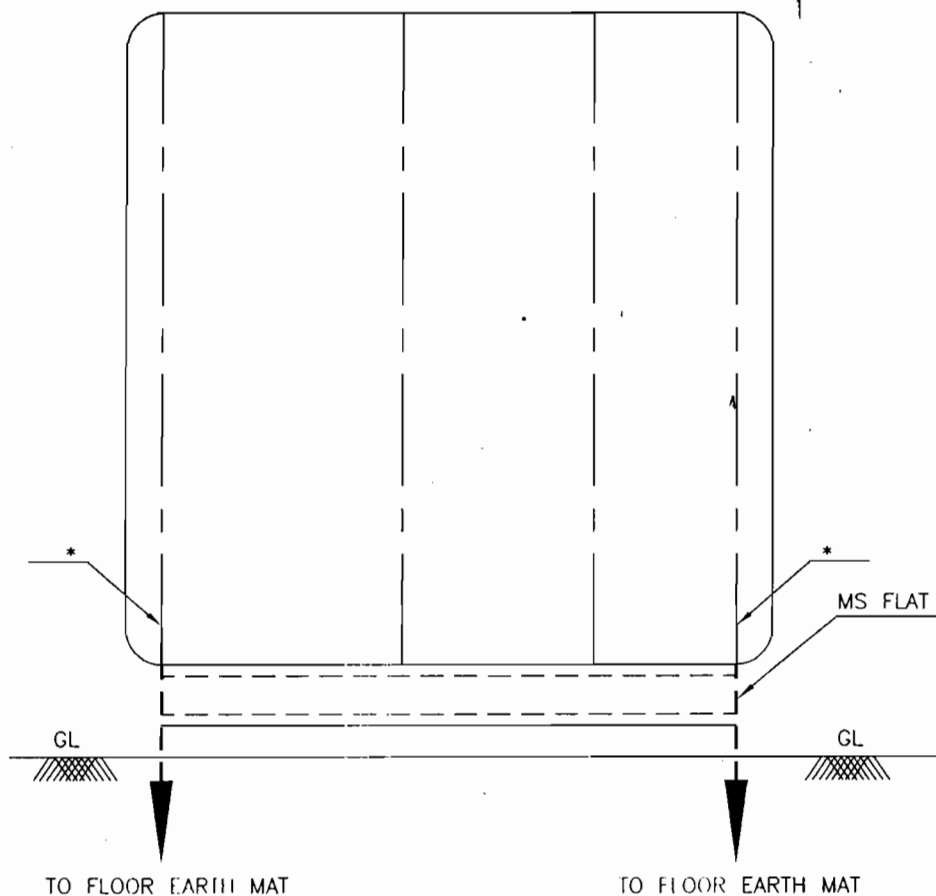
COMPUTERREF.NO.

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
20



EQUIPMENT

LT SWITCHGEAR

CHARGER

RELAY & CONTROL PANELS

FLAT SIZE

50X6 mm MS FLAT

50X6 mm MS FLAT

50X6 mm MS FLAT

NOTE:

1. * BOLTED JOINTS.

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



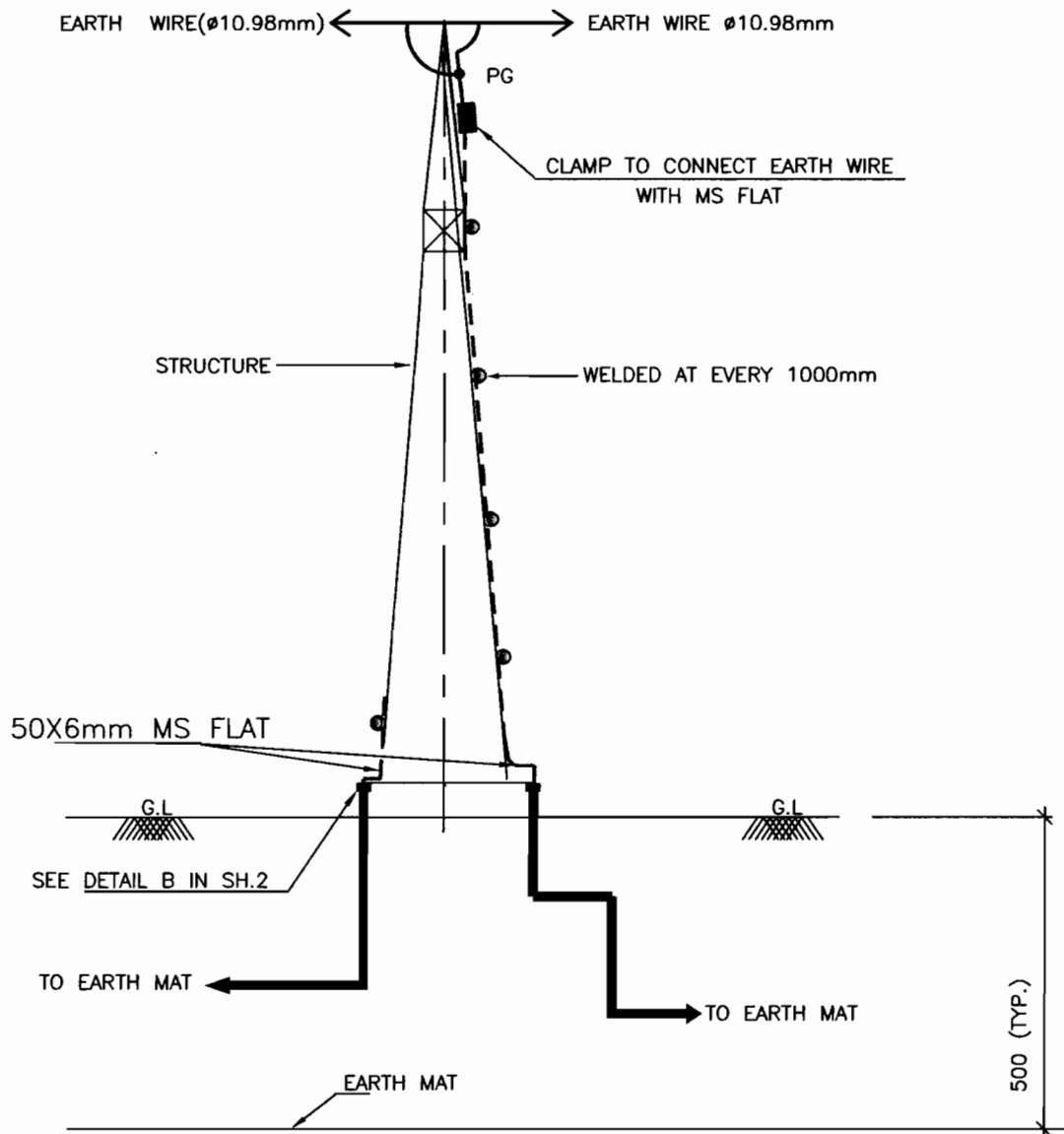
EQUIPMENT & STRUCTURE EARTHING DETAILS
LT SWITCHGEAR / CHARGER / RELAY & CONTROL PANEL

DRG. No.

TB-4-368-316-004

REV. 00

SHEET No.
21



NOTE:

1. NO. OF RISERS 2 NOS. / TOWER
2. CLAMP BETWEEN SHIELD WIRE & 50X6MM MS FLAT WILL WORK AS A TEST LINK.

Executive Engineer (R&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

TOWER WITH EARTH WIRE

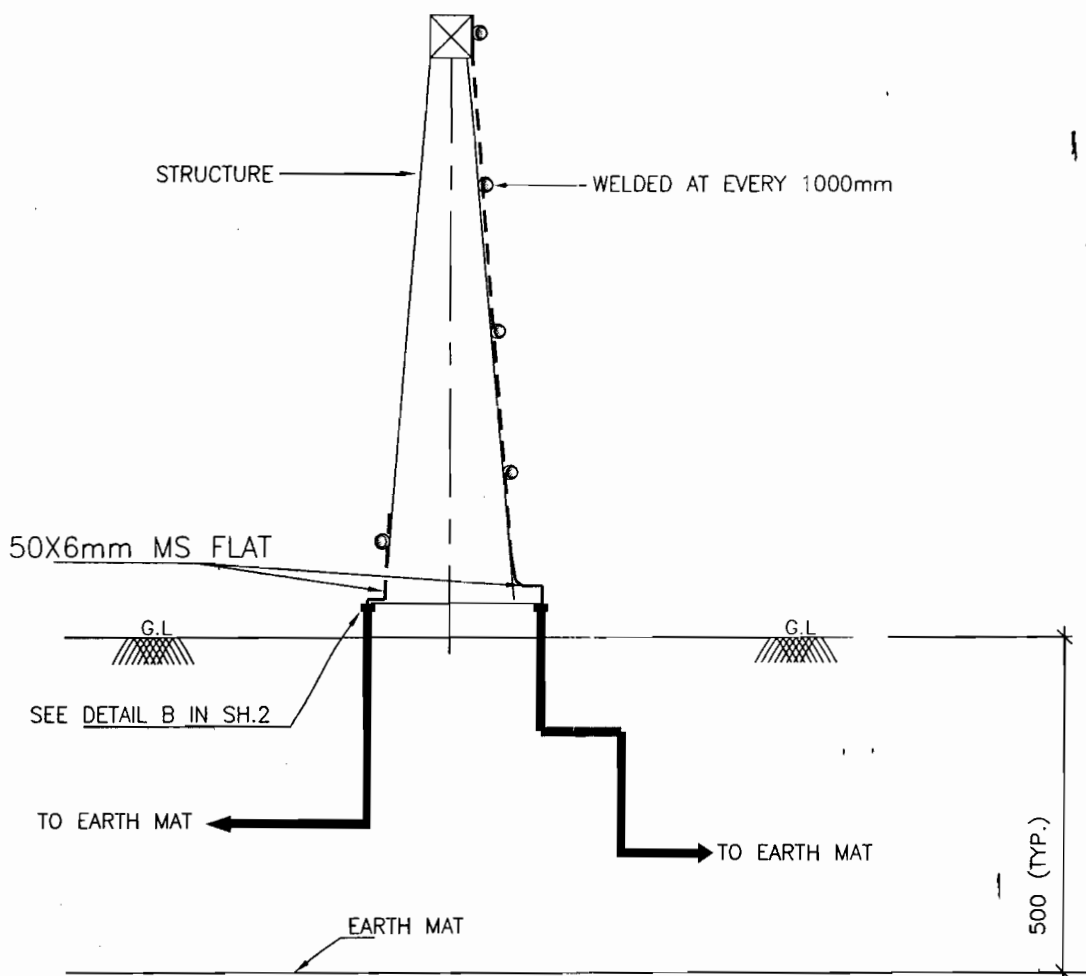
COMPUTER REF. NO.

DRG. No.

TB-4-368-316-004

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SHEET No.
22



NOTE:

1. NO. OF RISERS 2 NOS. / TOWER

(Signature)
 Executive Engineer
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

TOWER WITHOUT EARTH WIRE

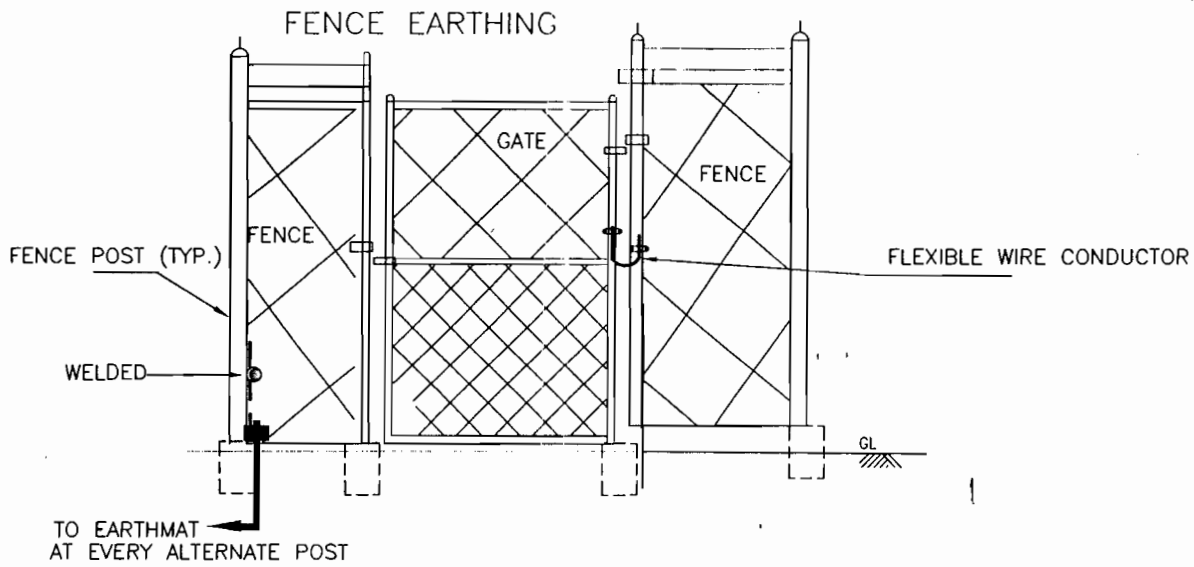
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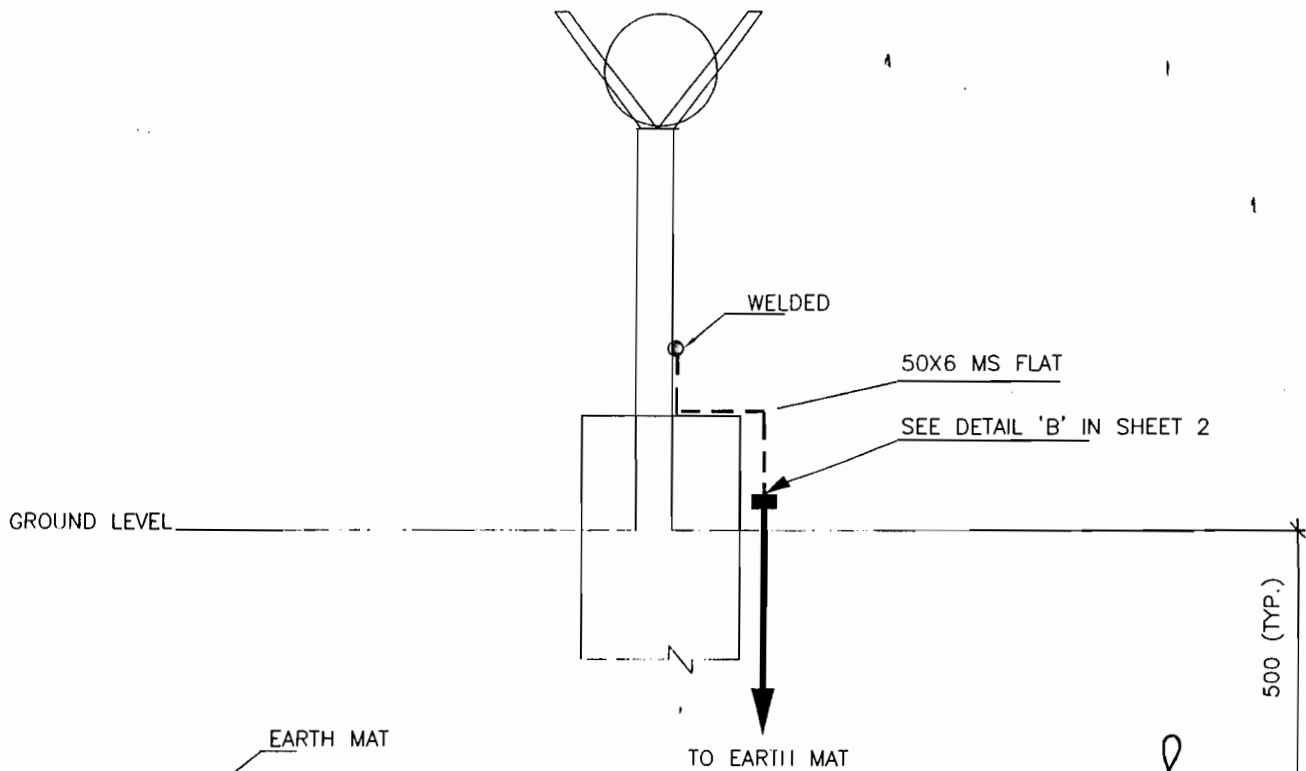
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REV. 00

SHEET No.
23



NOTE:- EVERY ALTERNATE FENCE POSTS SHALL BE EARTHED BY 50X6mm MS FLAT.



FENCE EARTHING

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



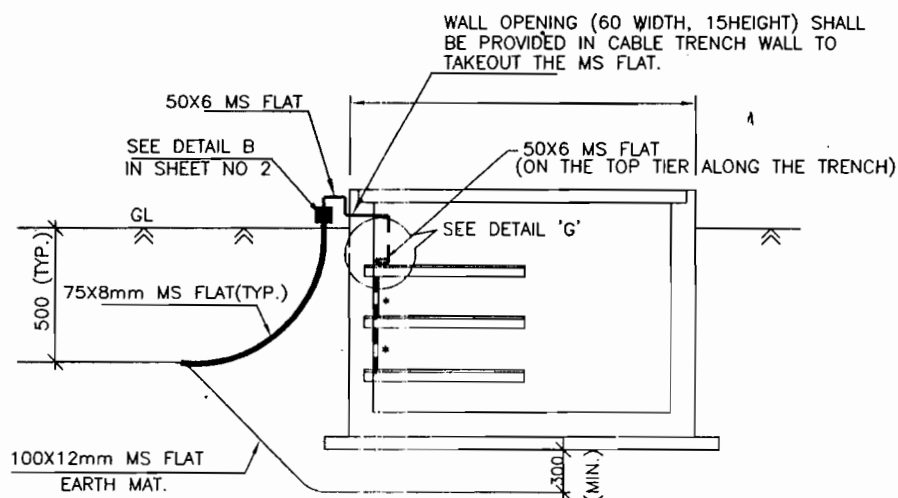
EQUIPMENT & STRUCTURE EARTHING DETAILS
FENCE POST

DRG. No.

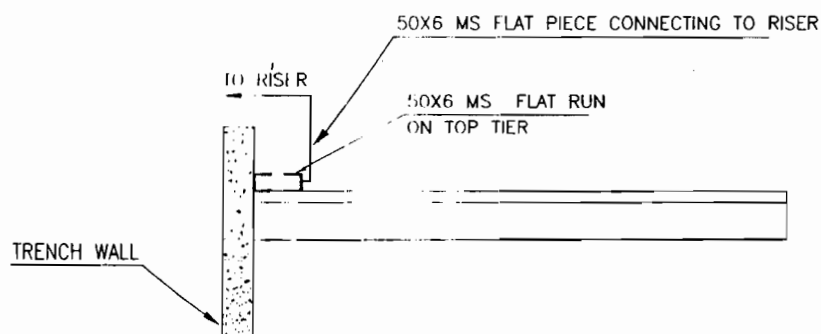
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REV. 00

SHEET No.
24



* NOTE- 50X6mm MS FLAT SHALL BE CONNECTED BETWEEN RACK ASSEMBLY.



DETAIL 'G'

DETAIL FOR CONNECTING MS FLAT RUNNING ON TOP TIER TRENCH TO RISER.

NOTE:

1. ALL TRENCHES SHALL BE EARTHED AT AN INTERVAL OF 30M ALONG THE LENGTH OF TRENCH.
2. THE EARTH STRIP (50X6 MS. FLAT) SHALL RUN ON THE TOP TIER ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACK AT EVERY 750mm INTERVAL.
3. WHERE THE CABLE RACKS ARE PROVIDED ON BOTH SIDES OF THE TRENCH, BOTH SIDES SHALL BE EARTHED.

Executive Engineer (P&M)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS CABLE TRENCH

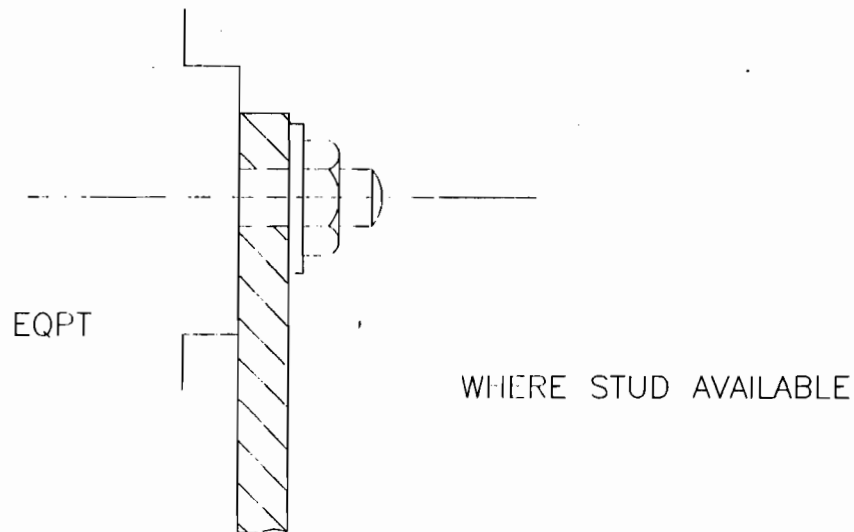
COMPU. DRG. REF.

DRG. NO.

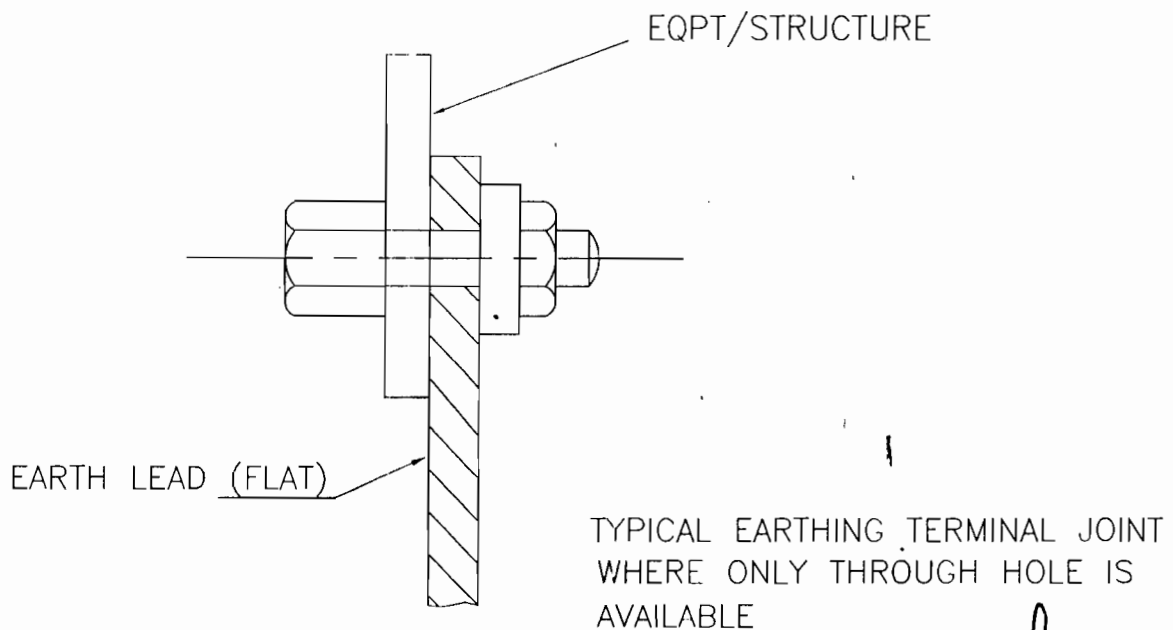
TB-4-368-316-004

REV. 00

SHEET
25



TYPICAL EARTHING TERMINAL JOINT



NOTE

1. THIS IS GENERAL TYPICAL BOLTING ARRANGEMENT APPLICABLE TO ALL PANELS, EQUIPMENT, ETC, WHERE BOLTING ARRANGEMENT IS PROVIDED.
2. IN CASE EARTHING TERMINAL COMPRISES ONLY A TAPPED HOLE SUITABLE BOLT/ SCREW WITH WASHER MAY BE USED FOR EARTHING CONDUCTOR TERMINATION


 Executive Engineer (P&D)
 O/o Chief Engineer (Procurement)
 MPPTCL, JABALPUR



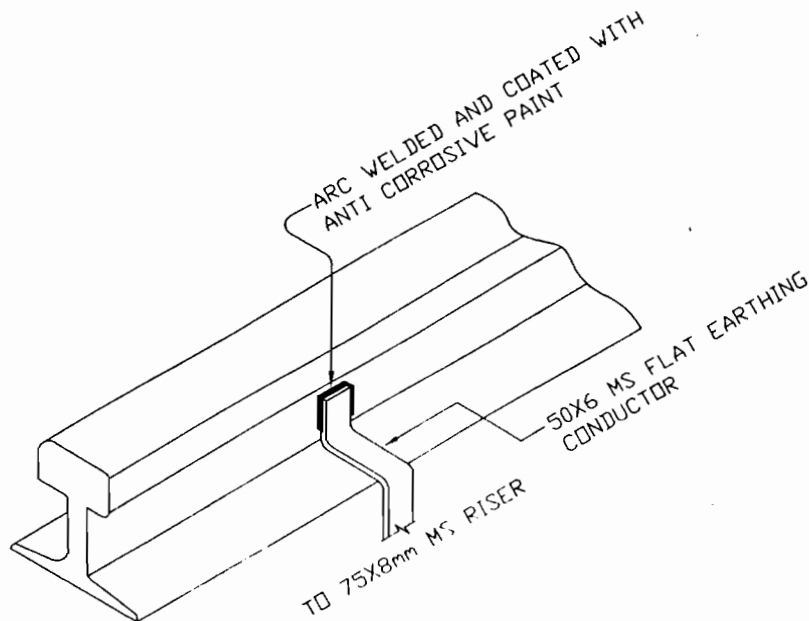
EQUIPMENT & STRUCTURE EARTHING DETAILS
TYPICAL ARRANGEMENT OF BOLTED JOINTS

DRG. No.

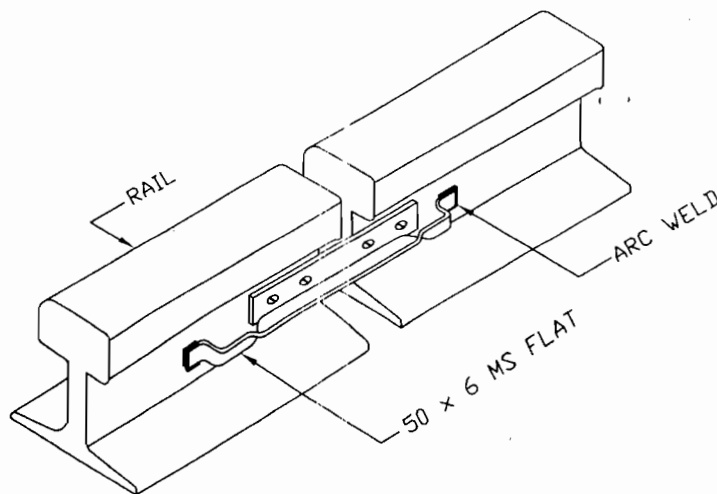
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SHEET No.
26



RAIL EARTHING



RAIL BONDING

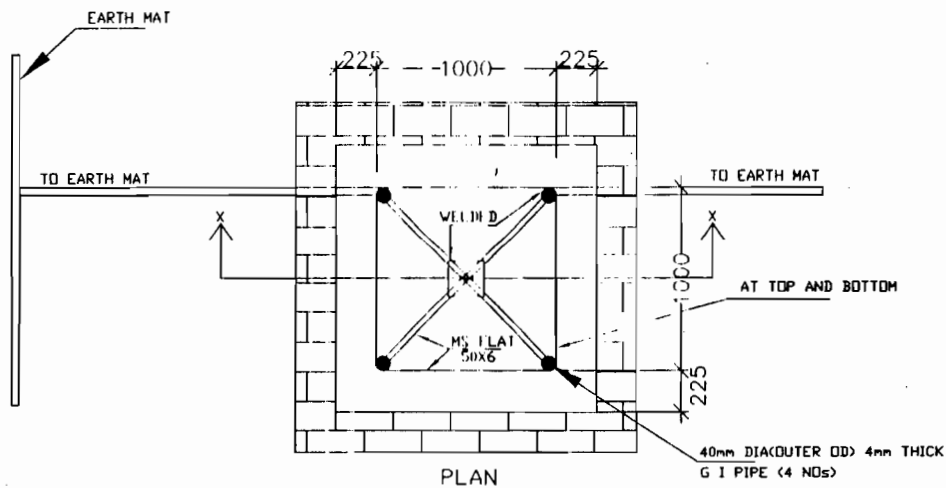
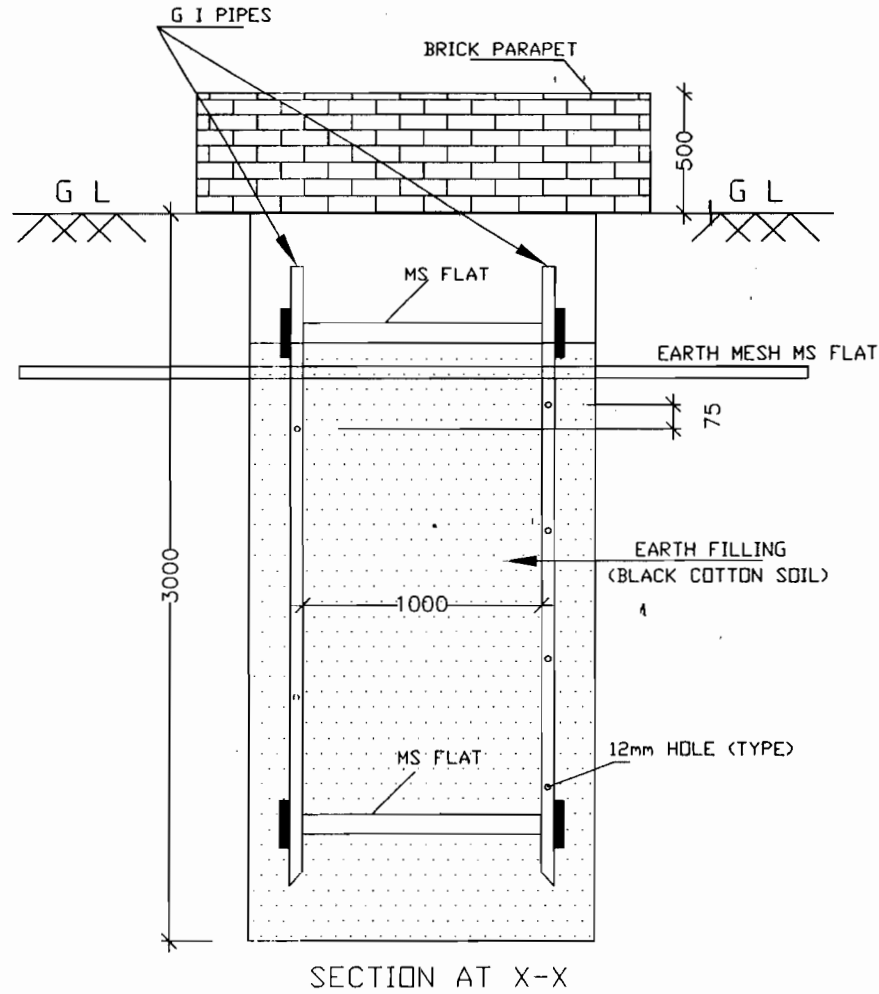
Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR

NOTE:-

1. RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE EARTHED AT A SPACING OF 30 m AND ALSO AT BOTH ENDS.



EQUIPMENT & STRUCTURE EARTHING DETAILS RAIL BONDING



DETAILS OF TREATED EARTH PIT

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

TREATED EARTH PIT DETAILS

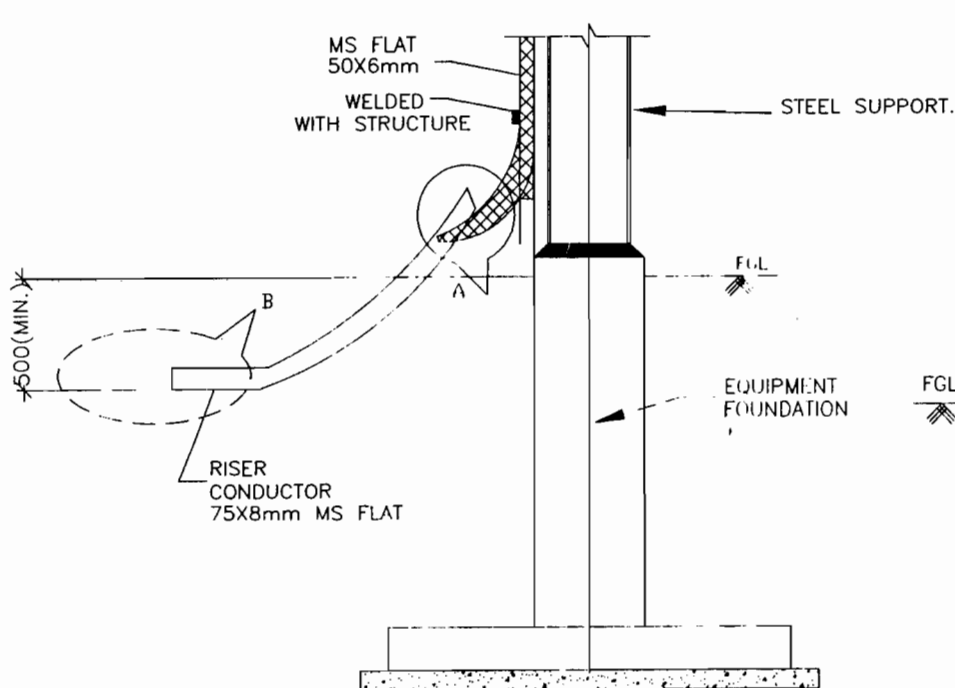
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DRG. No.

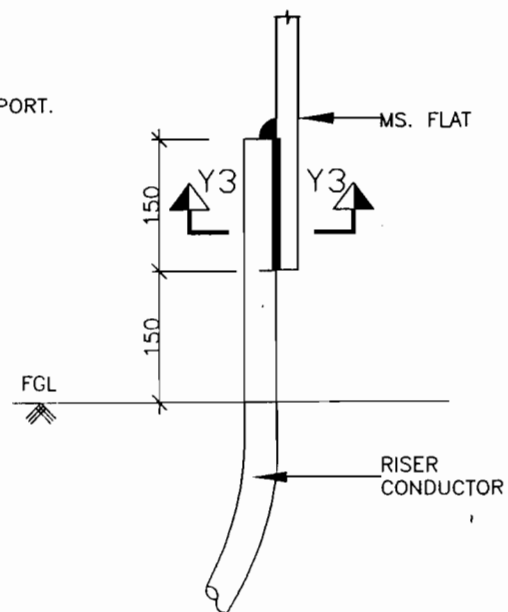
TB-4-368-316-004

REV. 00

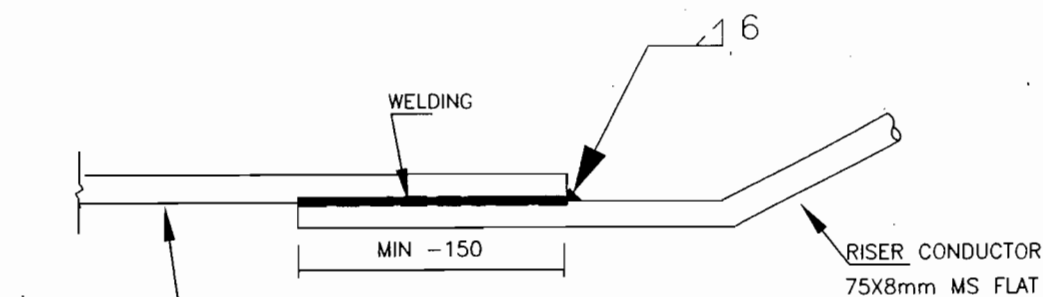
SHEET No.
28



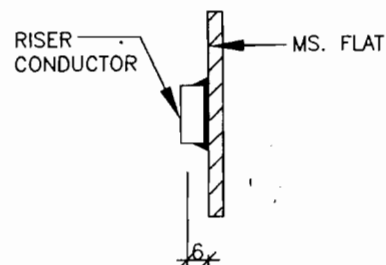
TYPICAL DETAILS OF RISER



ELEVATION
DETAIL-A



ELEVATION
DETAIL-B



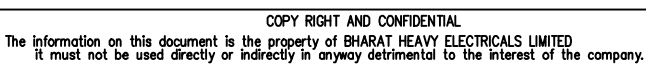
SECTION Y3-Y3

Executive Engineer (P&D)
O/o Chief Engineer (Procurement)
MPPTCL, JABALPUR



EQUIPMENT & STRUCTURE EARTHING DETAILS

WELDING DETAILS



बीएसडीएल
रहीम

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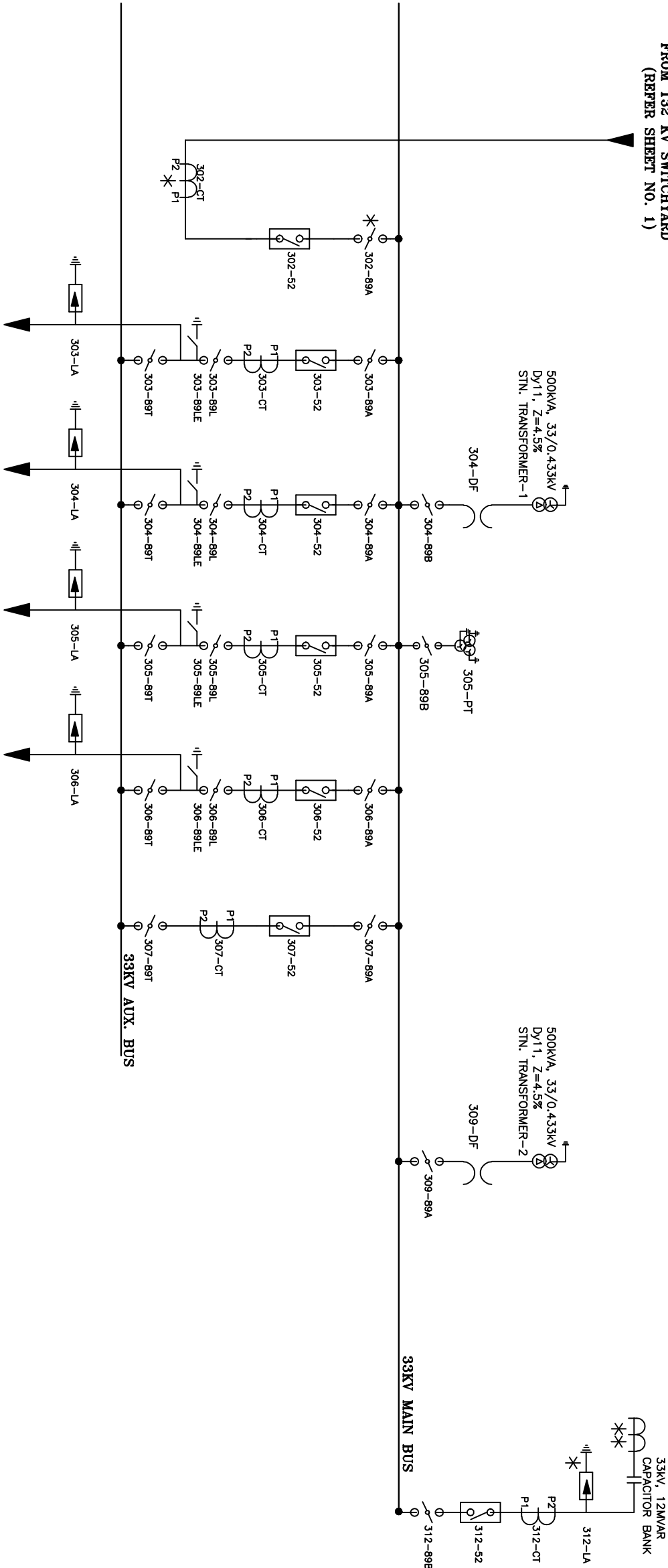
DEPT.422 कोडCODE

SHIRAZ/TITLE

SINGLESUBST3

V100-015-886-6-BL. ON GROUND

FROM 132 KV SWITCHYARD
(REFER SHEET NO. 1)



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COMPUTER DRG. PATH NAME :

INVENTORY No.	SIGN. & DATE	REF. DRG. No.	COMPUTER DRG. PATH NAME :		COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in anyway detrimental to the interest of the company.	
A			F			
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8			7			
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REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED			CHECKED			CHECKED
		APPROVED			APPROVED			APPROVED			APPROVED
ZONE			ZONE			ZONE			ZONE		

ADDITIONAL INFORMATION		W.O.No. 88012		STATUS OF DRAWING		DISTRIBUTION OF PRINTS		LOA No. 04-01/ADB-III/MPPTCL/TR601/LOT-1/TK-11/06802-3 DATED 28.02.2014		MADHYA PRADESH POWER TRANSMISSION COMPANY LTD. NAME OF CUSTOMER/PROJECT 400 kv S/s, T/s lines at Balaghat, Badnawar, Bhopal, Chhedaon and Nagda (Lot no. 1)	
BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION		BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION		BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION		BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION		BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION		BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION	
SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)		SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)		SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)		SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)		SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)		SINGLE LINE DIAGRAM FOR 400/132/33kv SUBSTATION AT KIRANPUR (BALAGHAT)	
TB-3-388-510-001A		TB-3-388-510-001A		TB-3-388-510-001A		TB-3-388-510-001A		TB-3-388-510-001A		TB-3-388-510-001A	
31/10/14		31/10/14		31/10/14		31/10/14		31/10/14		31/10/14	

VT00-015-886-6-BL. ON GNMVRD

BILL OF QUANTITY

S.NO	400KV EQUIPMENT DESCRIPTION	SYMBOL	QTY.	DESIG.
1	100MVA, 400/132/33kV 3 PH. AUTO TRANSFORMER		02	-
2	400KV, 2500A, 3 PH., 40KA FOR 3S SPRING OPERATED SF6 GAS CIRCUIT BREAKER		03	52
3	400KV, 2500A, 3 PH., 40KA FOR 3S SPRING OPERATED SF6 GAS CIRCUIT BREAKER		03	52
4	400KV, 2000A, 3 PH., 40KA FOR 1S PANTOGRAPH ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH 1 E/S (INDIVIDUAL MANUALLY OPERATED)		17	89
5	400KV, 2000A, 3 PH., 40KA FOR 1S HCB ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH 1 E/S (INDIVIDUAL MANUALLY OPERATED).		04	89
6	400KV, 2000A, 3 PH., 40KA FOR 1S HCB ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH 2 E/S (INDIVIDUAL MANUALLY OPERATED).		02	89
7	400KV, 2000-1000-500/-1-1-1-1 A, 40KA FOR 1S CT , 1 PH.		18	CT
8	400KV, 4400pf, 3 CORE, CVT 1-PH		12	CVT
9	390KV, 20KA, CLASS-4, SURGE ARRESTER 1-PH		12	LA
10	WAVE TRAP (2000A, 1mh) 40KA FOR 1 SEC., 1 PH. PEDESTAL TYPE.		04	WT

400KV CT PARAMETERS

Core No.	RATIO	Output Burden (VA) at lowest Tap	Min KVP (V)	Max Rct (Ohms)	Acc Class as per IEC 185
1	2000-1000-500/1 A	NA	2000/1000/500	30 on 2000/1 tap 60 on 1000/1 tap 120 on 500/1 tap	PS
2	2000-1000-500/1 A	NA	2000/1000/500	30 on 2000/1 tap 60 on 1000/1 tap 120 on 500/1 tap	PS
3	2000-1000-500/1 A	20	NA	NA	0.2s, ISF < 5
4	2000-1000-500/1 A	NA	4000/2000/1000	30 on 2000/1 tap 60 on 1000/1 tap 120 on 500/1 tap	PS
5	2000-1000-500/1 A	NA	4000/2000/1000	60 on 1000/1 tap 120 on 500/1 tap	PS

100MVA, 400/132/33kV ICT BUSHING CT (NEUTRAL Side)

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class
1	800/1	-	1000V	100mA	PS

100MVA, 400/132/33kV ICT BUSHING

CT (HV, IV Side)

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class
1	800/1	-	1000V	100mA	PS
2	800/1	-	1000V	100mA	PS
3	800/1	-	1000V	100mA	PS

33kV PT PARAMETERS

	RATIO	ACCURACY CLASS	BURDEN (VA)
SEC-1	33kV/43V/110V/43	3P	100
SEC-2	33kV/43V/110V/43	0.2	100

100MVA, 400/132/33kV ICT BUSHING

CT (Tertiary Side)

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class
1	400/1	-	-	250	ISF < 5
2	400/1	15	-	1	ISF < 5

400KV CVT PARAMETERS

	RATIO	ACCURACY CLASS	BURDEN (VA)
SEC-1	400KV/3/110V/3	3P	100
SEC-2	400KV/3/110V/3	3P	100
SEC-3	400KV/3/110V/3	0.2	100

132kV, 400/1-1-1-1A CT PARAMETERS

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class
1	400/1A	-	1100	50	PS
2	400/1A	30	300	50	5P/10
2	400/1A	15	-	50	0.2S, ISF < 5

132kV, 800/1-1-1-1A CT PARAMETERS

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class
1	800/1A	-	1100	50	PS
2	800/1A	30	300	50	5P/10
2	800/1A	15	-	50	0.2S, ISF < 5

40MVA, 132/33kV ICT BUSHING CT (HV, LV & NEUTRAL Side)

Core No.	RATIO	Output Burden at lowest Tap (VA)	Min KVP (V)	Max Rct (Ohms)	Acc Class	Remarks
1	200/1	-	1000V	100mA	PS	HV side
2	800/1	-	1000V	100mA	PS	LV side
3	800/1	-	1000V	100mA	PS	LV neutral side
4	200/1	-	1000V	100mA	PS	HV neutral side

132kV PT PARAMETERS

	RATIO	132kV / 43V / 110V / 43
Sec1	Class: 3P, 100VA	
Sec2	Class: 0.2, 100VA	

33kV, 1200A/1-1-1-1-1A CT PARAMETERS

Core No.	Current Ratio	Output Burden	Accuracy class	Min. Knee Point Voltage VK	Max. CT Secondary winding resistance	Max. exciting current at KVP
1	1200/1 A	-	PS	1100 V	6 Ω	50 mA
2	1200/1 A	30 VA	5P/10	-	3 Ω	100 mA
3	1200/1 A	15 VA	0.2s	-	-	-
4	1200/1 A	15 VA	0.2s	-	-	-

33kV, 400A/1-1-1A CT PARAMETERS

Core No.	Current Ratio	Output Burden	Accuracy class	Min. Knee Point Voltage VK	Max. CT Secondary winding resistance	Max. exciting current at KVP
1	400/1 A	30 VA	5P/10	0.2s	3 Ω	100 mA
2	400/1 A	15 VA	ISF < 5	-	-	-

33kV, 5A/1A CT PARAMETERS

Core No.	Current Ratio	Output Burden	Accuracy class	Min. Knee Point Voltage VK	Max. CT Secondary winding resistance	Max. exciting current at KVP
1	5/1 A	15 VA	5P/10	-	-	-

INVENTORY No.

SIGN. & DATE

REF. DRG. No.

COMPUTER DRG. PATH NAME :

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