

REV. DATE

ALTERED
CHECKED
APPD

REV. DATE

ALTERED
CHECKED
APPD

JOB No. -

LEGEND

CONNECTION TO GROUND MAT THROUGH RISER.

PE CONNECTION TO PIPE ELECTRODE.

RISER

GENERAL NOTES:

1 EARTH STRIP CLEATED TO LATTICE TYPE STRUCTURE AT AN INTERVAL OF 1.0M SUITABLE PROVISION SHALL BE MADE WITH SUPPORT STRUCTURE.

2 ALL EARTH STRIPS SHALL BE TAKEN ALONG EDGE OF STRUCTURE. ALL DRAWING SHOWS TYPICAL ARRANGEMENT ONLY.

3 ALL STRUCTURES/EQUIPMENTS SHALL BE EARTHED AS SHOWN IN THE FOLLOWING SHEETS.

4 BOLT SIZE FOR CONNECTING EARTHING FLAT TO THE EQPT/STRUCTURE SHALL BE TO SUIT RESPECTIVE HOLE SIZE.

5. ALL EARTHING SHALL BE DONE IN ACCORDANCE WITH IS:3034 UNLESS OTHERWISE STATED IN TECHNICAL SPECIFICATION

6 TWO EARTHING STRIPS SHALL BE CONNECTED TO ONE RISER.

7 EACH RISER OF A PARTICULAR EQUIPMENT SHALL BE CONNECTED TO A DIFFERENT EARTH FLAT.

8 FOR WELDING DETAILS REFER SHEET #18 .

9 E/WIRE DOWN CONDUCTOR SHALL BE CLEATED AT AN INTERVAL OF 2.0 M ALONG WITH STRUCTURE NO HOLES IN STRUCTURE IS ALLOWED FOR THIS PURPOSE

10 MS FLAT SIZE 75X10mm SHALL BE USED FOR MAIN CONDUCTOR OF EARTH/MAT AND 50X8mm SHALL BE USED FOR RISERS.

SHEET NO. DESCRIPTION

02. 400kV SF6 CIRCUIT BREAKER

02A. 220/33kV SF6 CIRCUIT BREAKER

03. 400 CVT & 220/33kV PT

04. 400/220/33kV POST INSULATOR (SOLID CORE TYPE)

05. 390/198/54/39/30kV LIGHTNING ARRESTER

06. MARSHALLING KIOSK

07. 400kV HORIZONTAL CENTER BREAK ISOLATOR WITH ONE EARTH SWITCH

7A. 400kV HORIZONTAL CENTER BREAK ISOLATOR WITH TWO EARTH SWITCH

7B. 400kV BUS EARTHING SWITCH

7C. 220kV HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH

7D. 220kV HORIZONTAL DOUBLE BREAK ISOLATOR WITHOUT EARTH SWITCH

08. SHIELD WIRE TOWER

08A. LIGHTING MAST

09. 400/220kV CURRENT TRANSFORMER

10. CABLE TRENCH

SHEET NO. DESCRIPTION

11. DETAIL OF PIPE EARTH ELECTRODE IN TREATED EARTH PIT (ET)

12. RAIL BONDING

13. LT TRANSFORMER

13A. AUTO TRANSFORMER

14. AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH./E/S MECH. BOX.

15. SWITCHGEAR / MCC / CONTROL AND RELAY BOARD/AC KIOSK

16. FENCE POST

17. TYPICAL ARRANGEMENT OF BOLTED JOINTS

18. WELDING DETAILS

19. 400/220kV WAVE TRAP

COMPUTER DRG. PATH NAME :

W.O.NO. 89001

STATUS

CUSTOMER

PROJECT

MAHARASHTRA STATE ELECTRICITY TRANS CO. LTD.

400/220kV CHANDRAPUR-II SUBSTATION

DEPT CODE

NAME

SIGN.

DATE

DESIGN

MS

CHD

DS

APPD

SIN

SIGN & DATE

REF. DRG. NO.

INVENTORY NO.

REV. DATE ALTD CHD APPD

TITLE

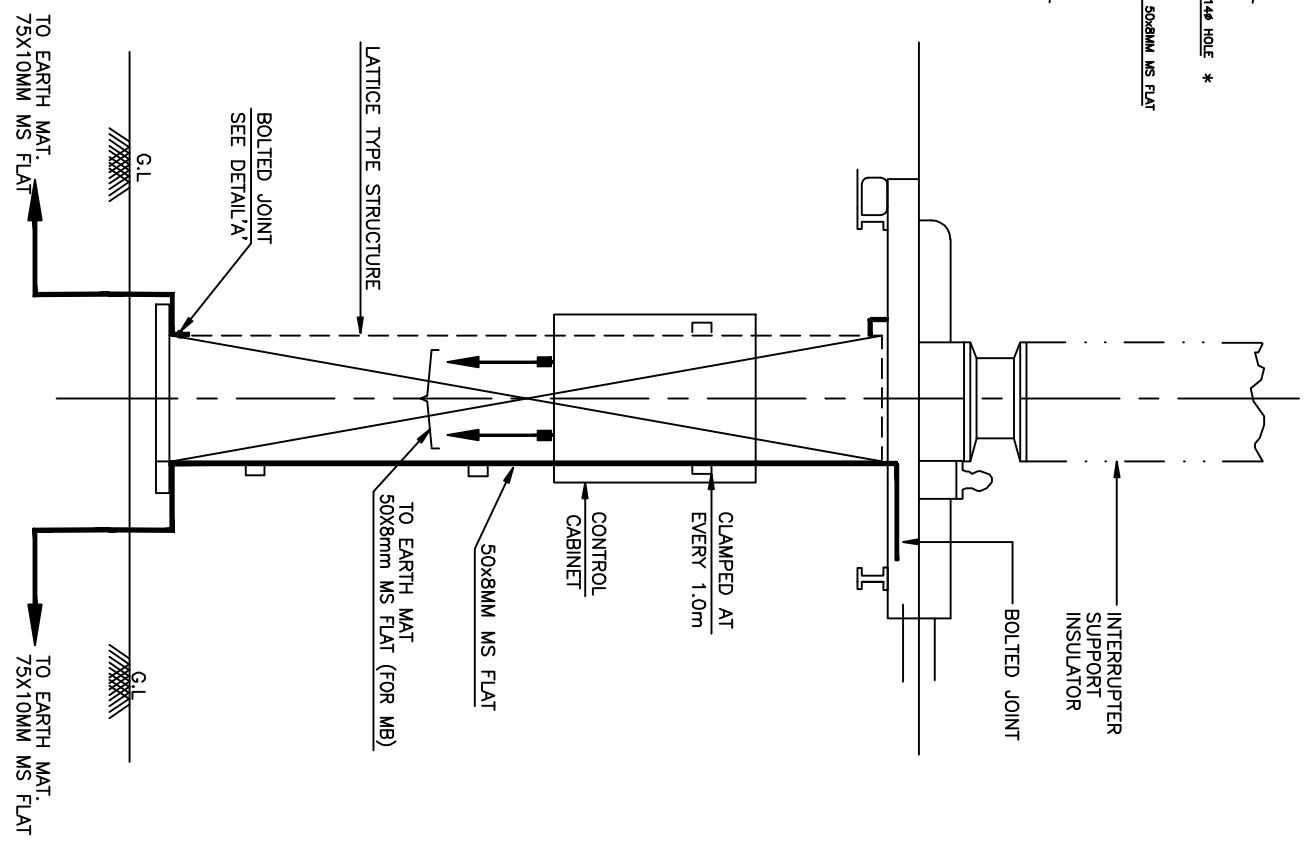
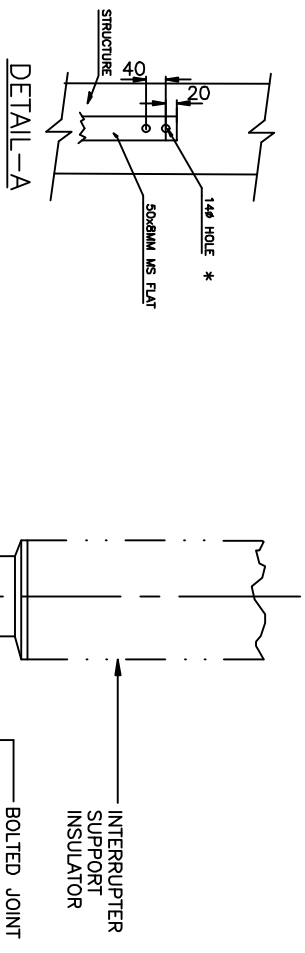
EQUIPMENT & STRUCTURE EARTHING DETAILS

DRAWING NO.

TB-4-325-316-007

SHEET 1 OF

REV. 00

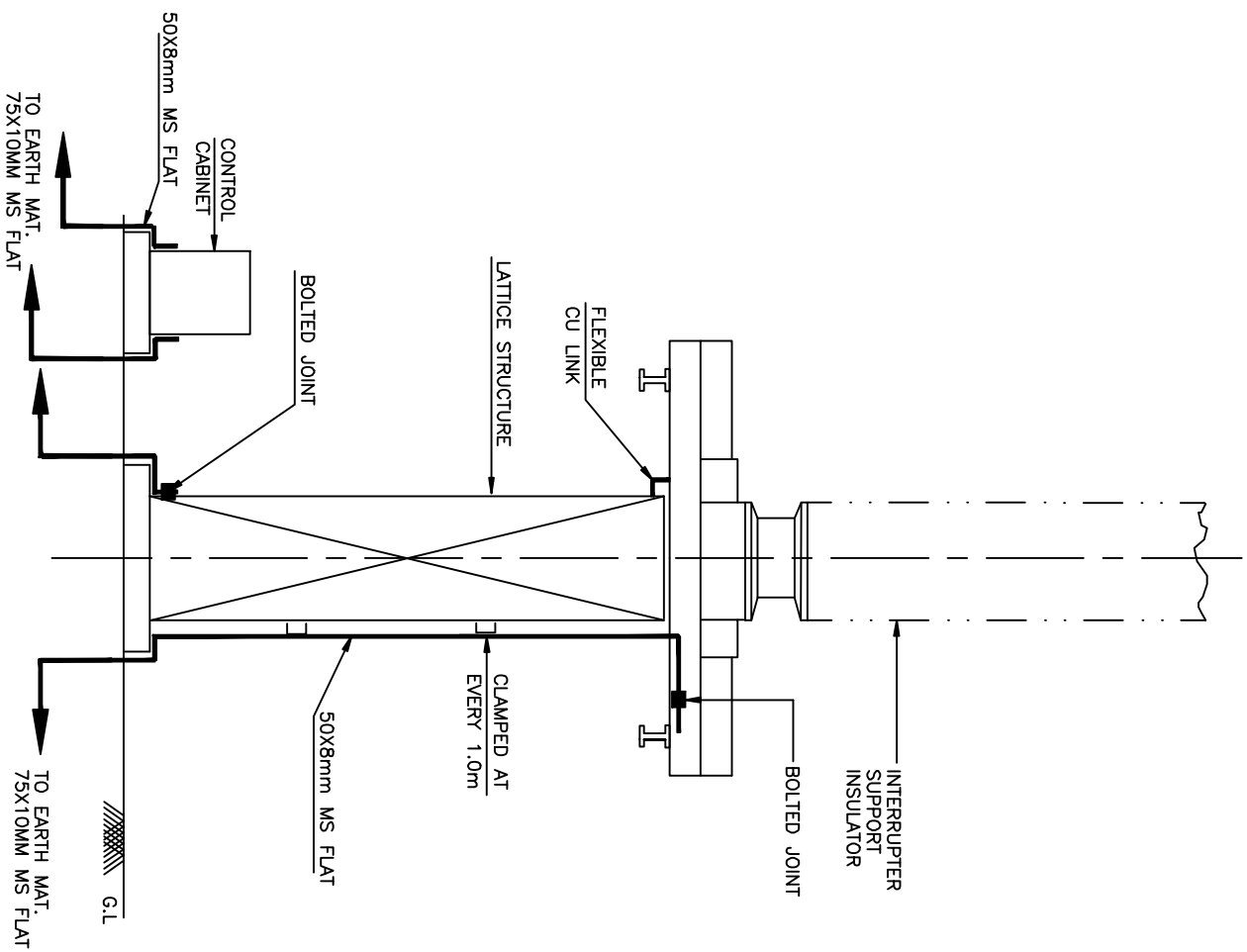


NOTE:
1) * BOLT SIZE AND HOLE SIZE SHALL BE TO SUIT RESPECTIVE EQPT./STRUCTURE.



EQUIPMENT EARTHING DETAILS 400kV SF6 CIRCUIT BREAKER

COMPUTER REF. NO.	DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 2
-------------------	----------	------------------	---------	----------------



NOTE:

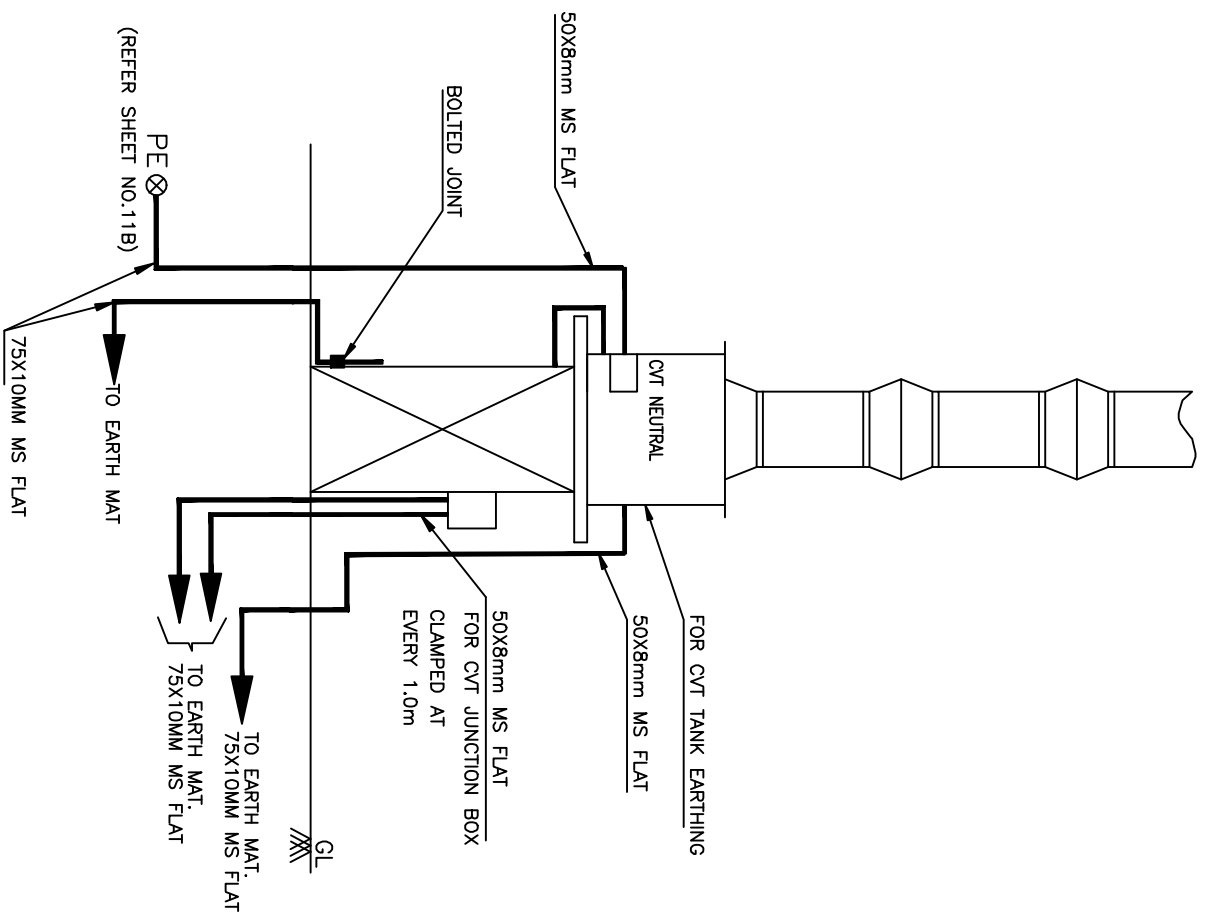
- 1) LOCAL CONTROL CABINET, BREAKER POLE, LADDER & COMPRESSOR UNIT SHALL BE EARTHED SEPARATELY.



EQUIPMENT EARTHING DETAILS

220kV SF6 CIRCUIT BREAKER

COMPUTER REF. NO.	DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 2A
-------------------	----------	------------------	---------	-----------------



EQUIPMENT EARTHING DETAILS

400/220kV CVT & 33kV PT

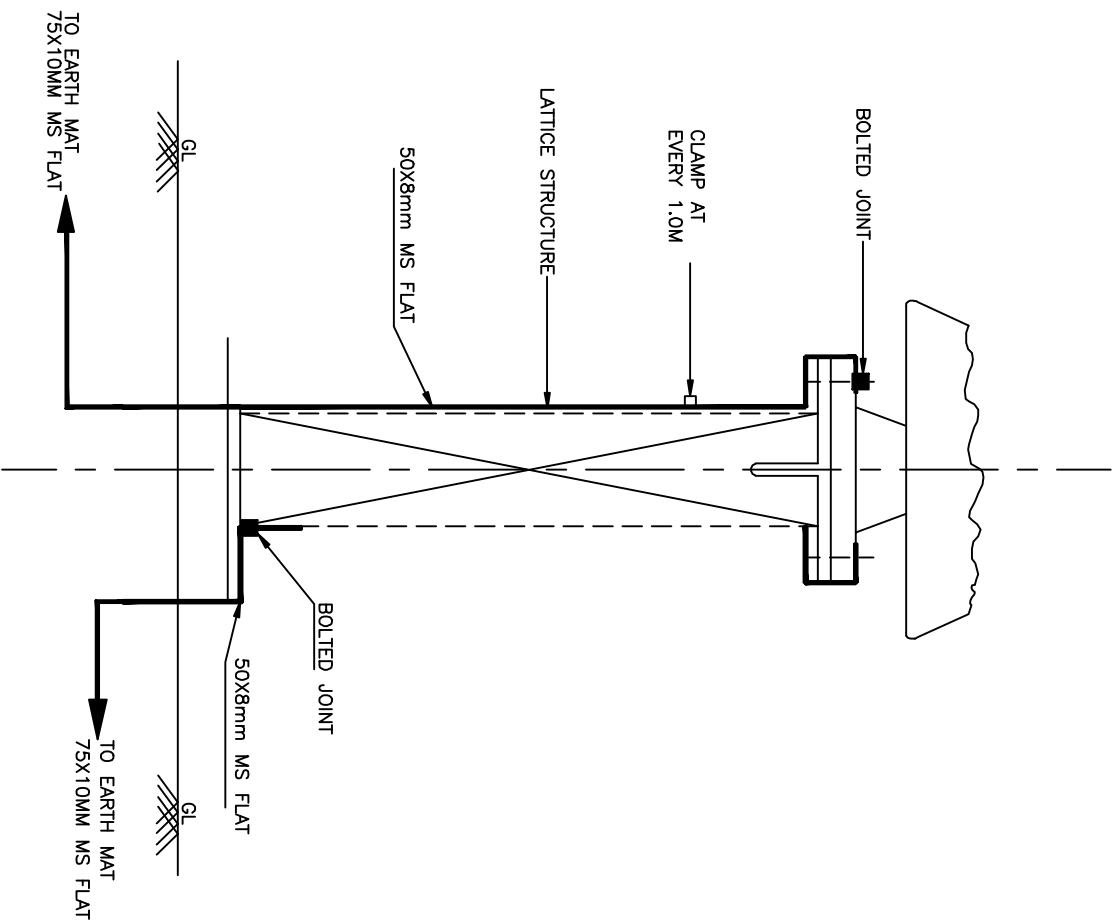
COMPUTER REF. NO.

DRG. No.

TB-4-325-316-007

REV. 00

SHEET No.
3

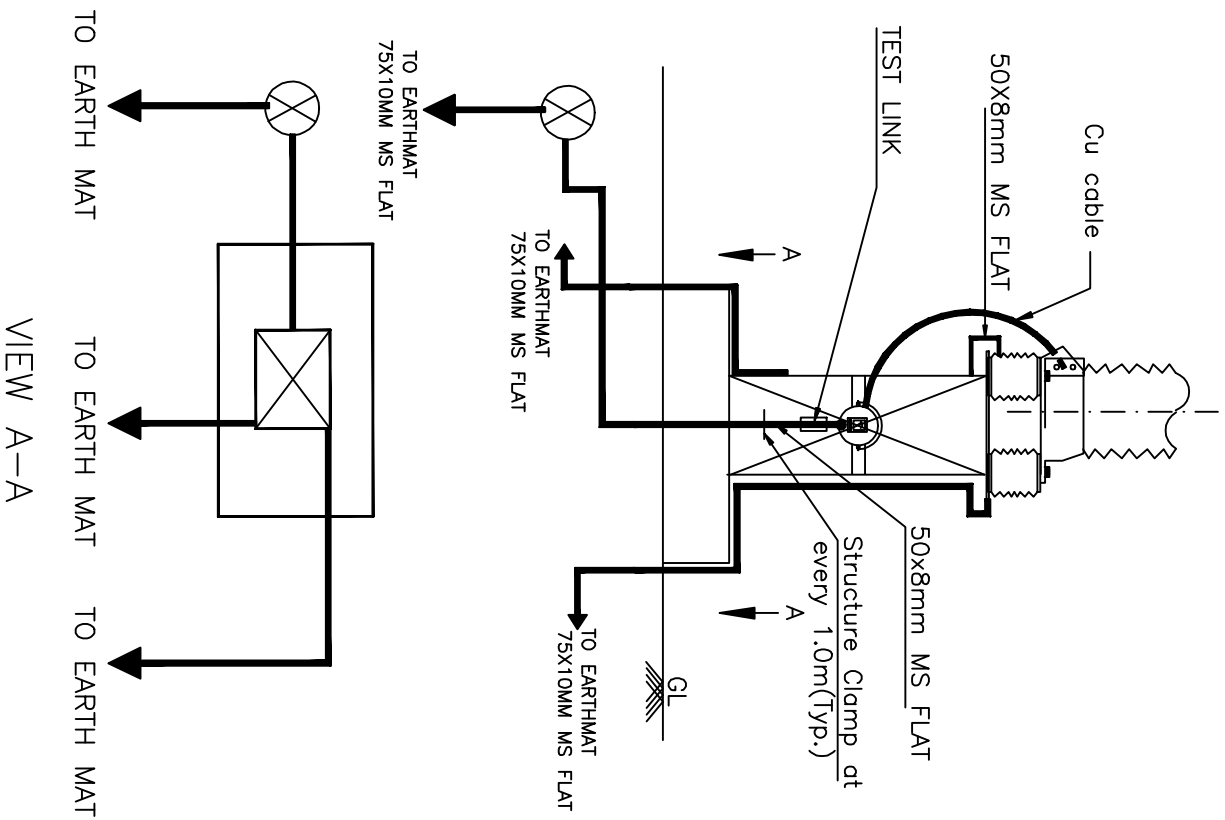


EQUIPMENT EARTHING DETAILS 400/220/33kV POST INSULATOR (SOLID CORE TYPE)

DRG. No. TB-4-325-316-007

REV. 00

SHEET No.
4



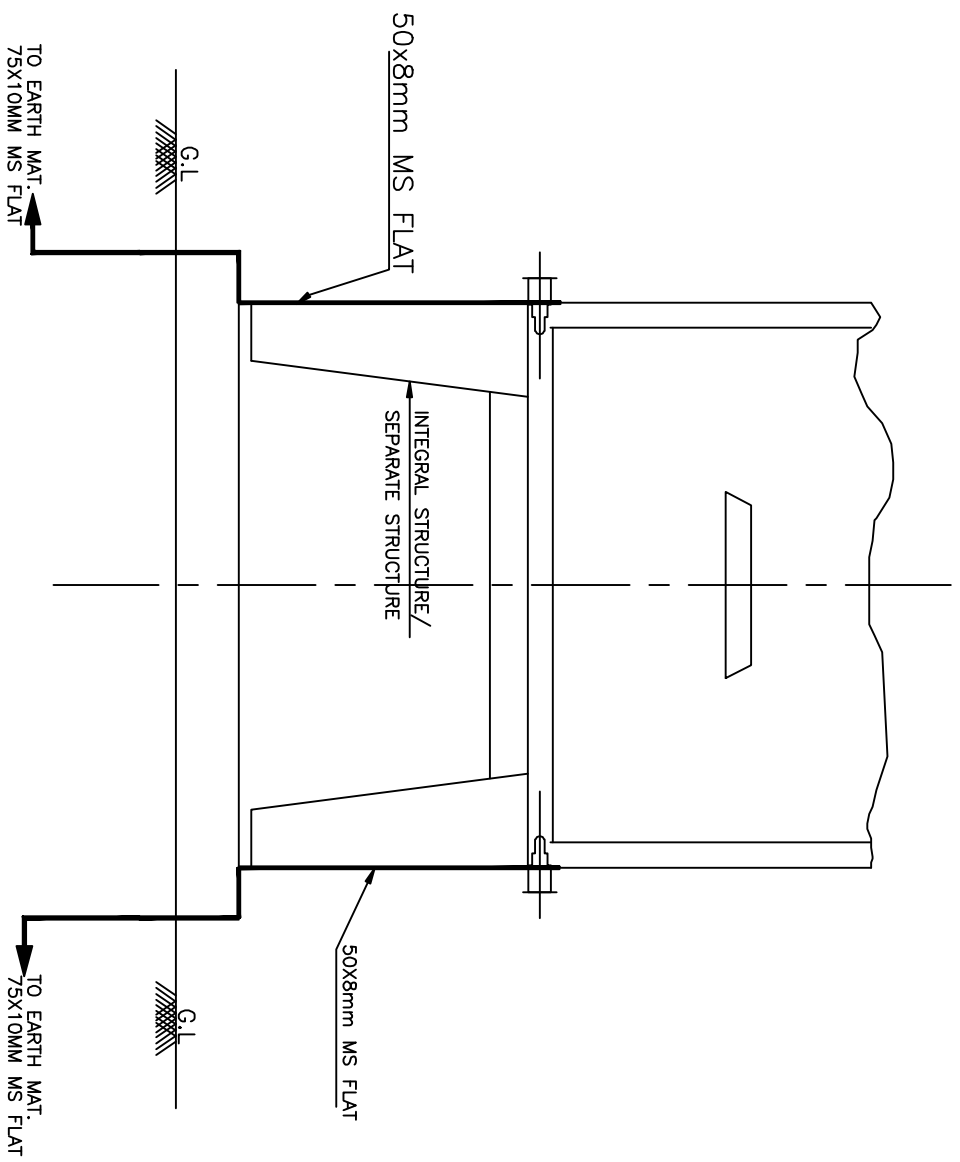
NOTES;

1. LA SHALL BE EARTHED THROUGH EARTH TERMINAL OF SURGE COUNTER
2. TEST LINK SHALL HAVE PROVISION TO BOLT TEST LEAD BEFORE ISOLATING THE MAIN EARTHING CONNECTIONS (AS PER SKETCH ABOVE) = 1NO.



EQUIPMENT EARTHING DETAILS
390/198/54/39/30kV LIGHTNING ARRESTER

COMPU. DRG. REF.	DRG.NO.	TB-4-325-316-007	REV. 00	SHEET No. 5
------------------	---------	------------------	---------	----------------



EQUIPMENT EARTHING DETAILS

MARSHALLING KIOSK

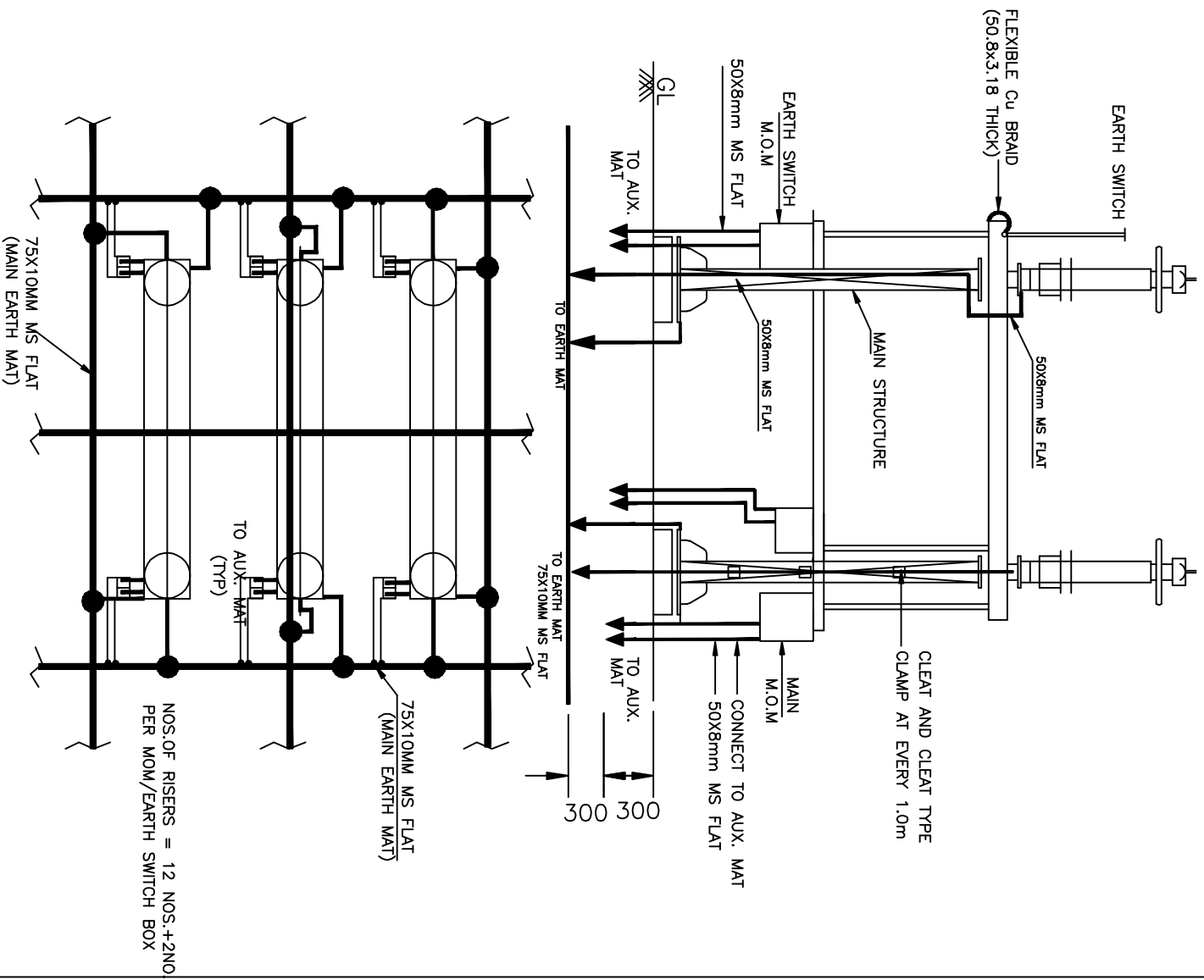
COMPUTER REF. NO.

DRG. No.

TB-4-325-316-007

REV. 00

SHEET No.
6



- NOTES**
1. AUXILIARY EARTH MAT SHALL BE PROVIDED BELOW EVERY MOM BOX (REFER SHEET 14).
- RISER



EQUIPMENT EARTHING DETAILS

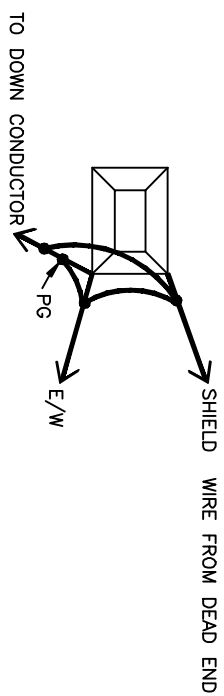
400kV HORIZONTAL CENTER BREAK ISOLATOR WITH 2 E/S

COMPUTER REF. NO.

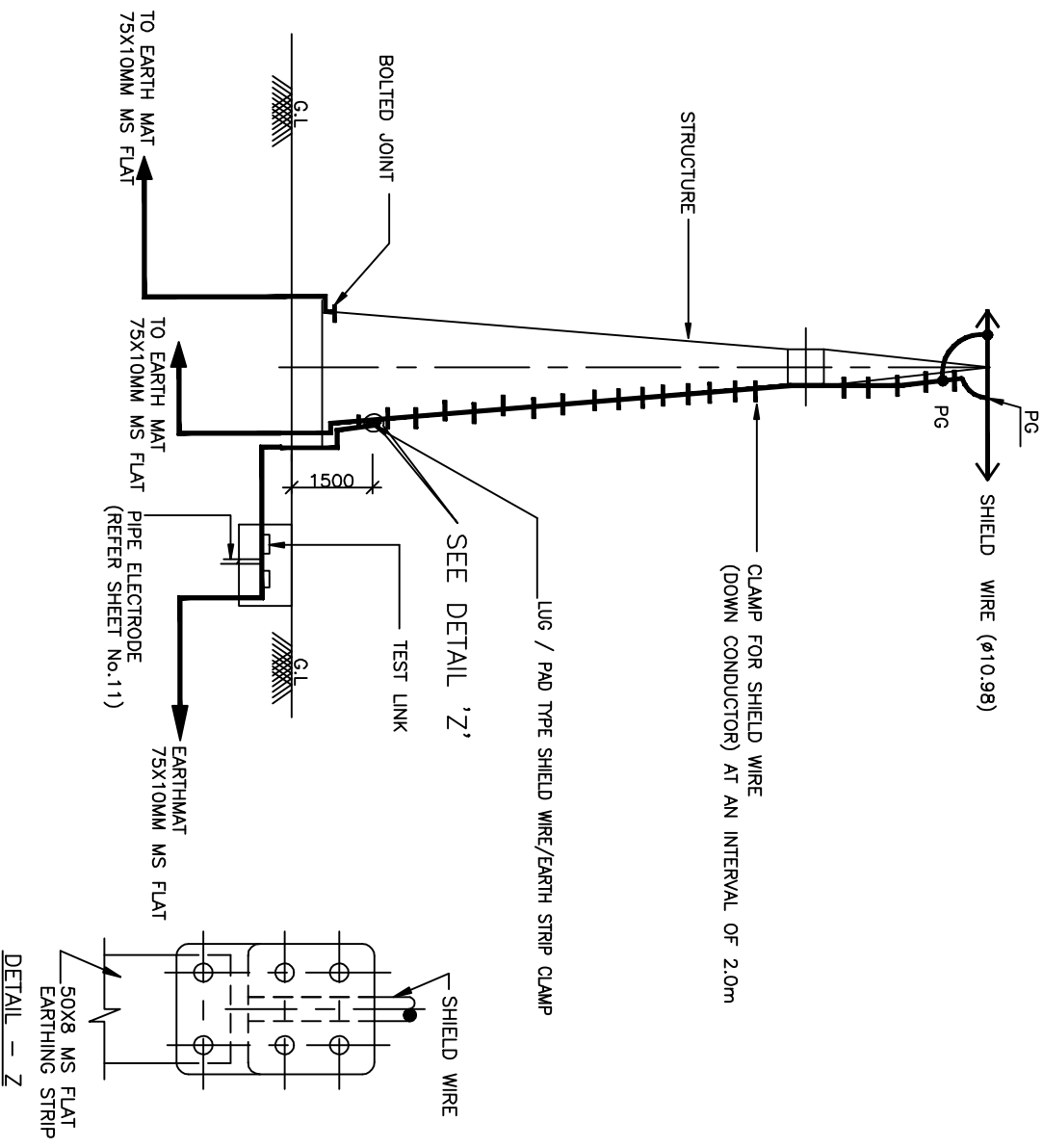
DRG. No. TB-4-325-316-007

REV. 00

SHEET No.
7A



DETAIL WHEN 2 & E/WIRE TERMINATES A TOWER



NOTE:

1. NO. OF PIPE ELECTRODE WITH TEST PIT : 1 NO. PER TOWER WITH DOWN CONDUCTOR.



EQUIPMENT EARTHING DETAILS

SHIELD WIRE TOWER

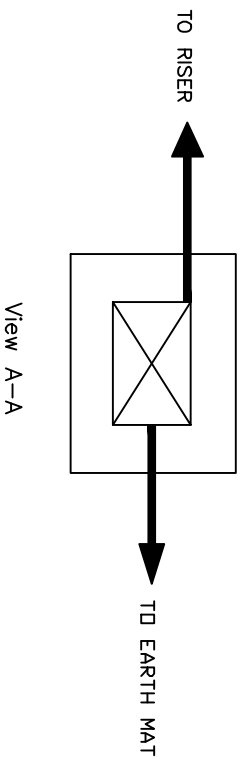
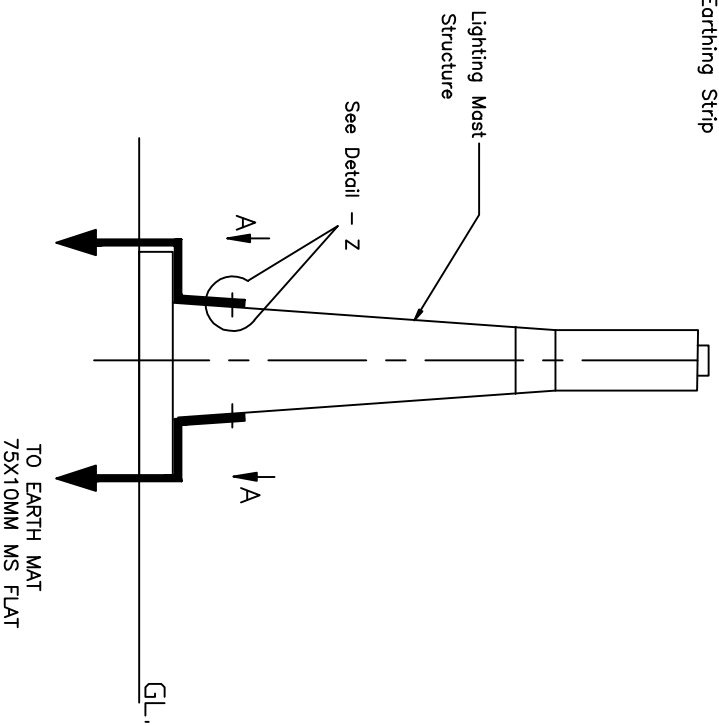
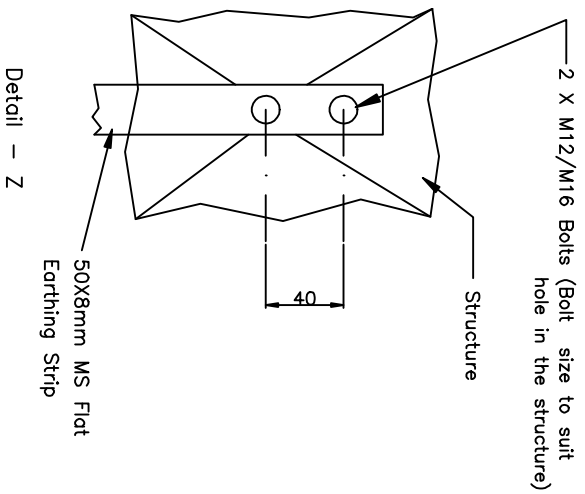
COMPUTER REF. NO.

DRG. No.

TB-4-325-316-007

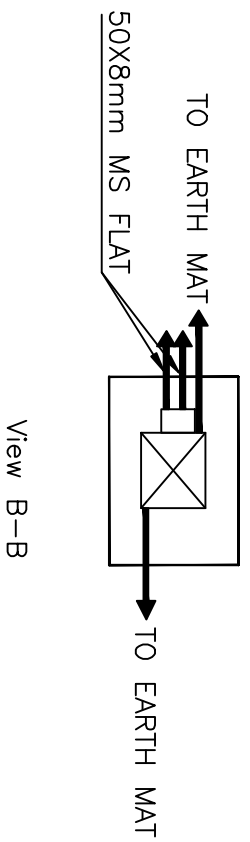
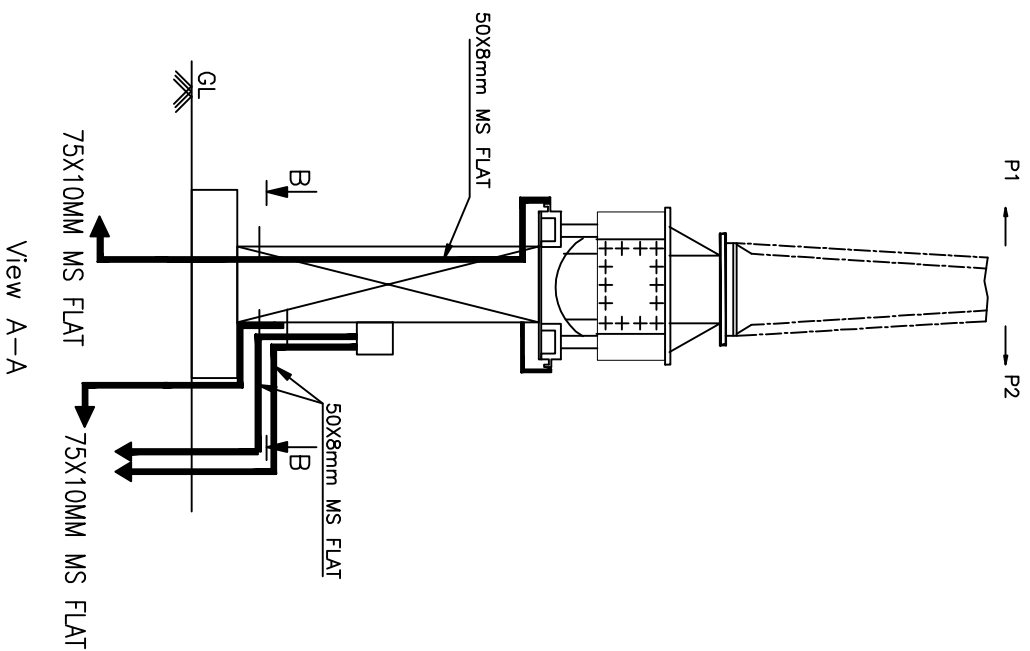
REV. 00

SHEET No.
8



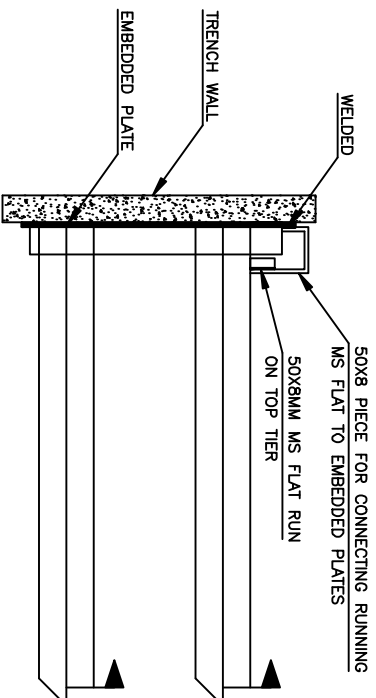
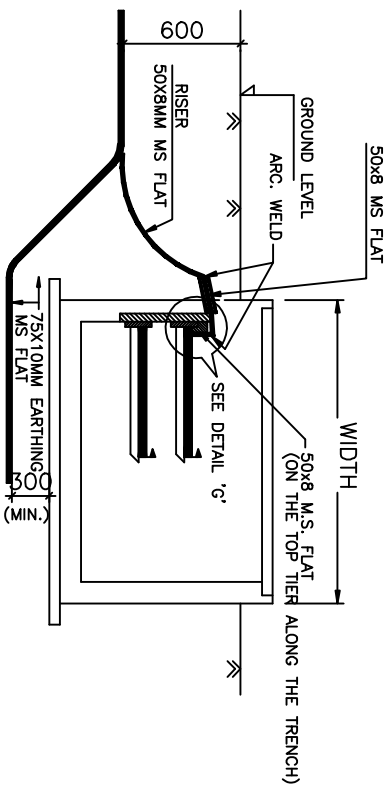
EQUIPMENT EARTHING DETAILS LIGHTING MAST

COMPUTERREF. NO.	DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 8A
------------------	----------	------------------	---------	-----------------



EQUIPMENT EARTHING DETAILS 400/220kV Current Transformer

COMPU. DRG. REF.	DRG.NO.	TB-4-325-316-007	REV. 00	SHEET No. 9
------------------	---------	------------------	---------	----------------



DETAIL 'G'

DETAIL FOR CONNECTING GI FLAT RUNNING
ON TOP TIER TRENCH TO EMBEDDED PLATE.

NOTE:

1. ALL TRENCHES SHALL BE EARTHED AT AN INTERVAL OF 30M ALONG THE LENGTH OF TRENCH & FREE ENDS.
2. THE EARTH STRIP (50x8 M.S. FLAT) SHALL BE WELDED TO EMBEDDED PLATE AT EVERY 0.75M INTERVAL.
3. WHERE THE CABLE RACKS ARE PROVIDED ON BOTH SIDES OF THE TRENCH, BOTH SIDES SHALL BE EARTHED AS PER ABOVE.



EQUIPMENT EARTHING DETAILS
CABLE TRENCH

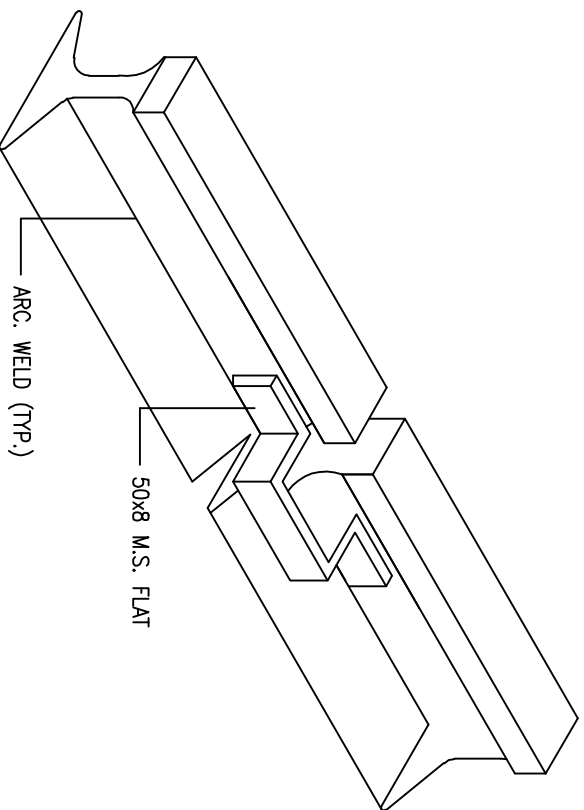
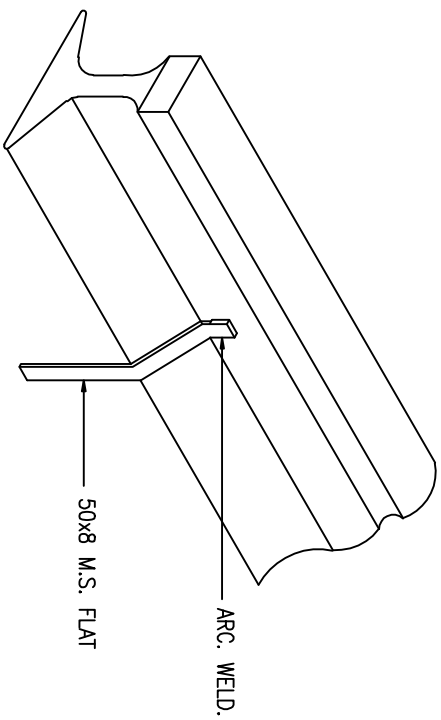
COMPU. DRG. REF.

DRG. NO.

TB-4-325-316-007

REV. 00

SHEET
10



NOTE:—

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



EQUIPMENT EARTHING DETAILS RAIL BONDING

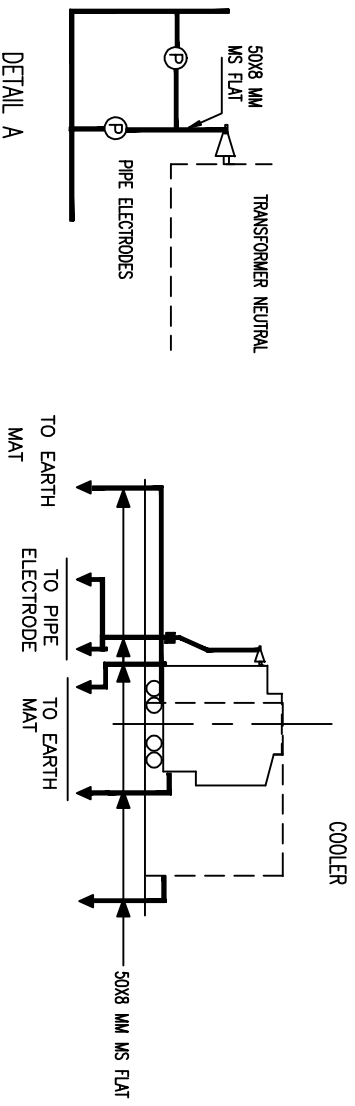
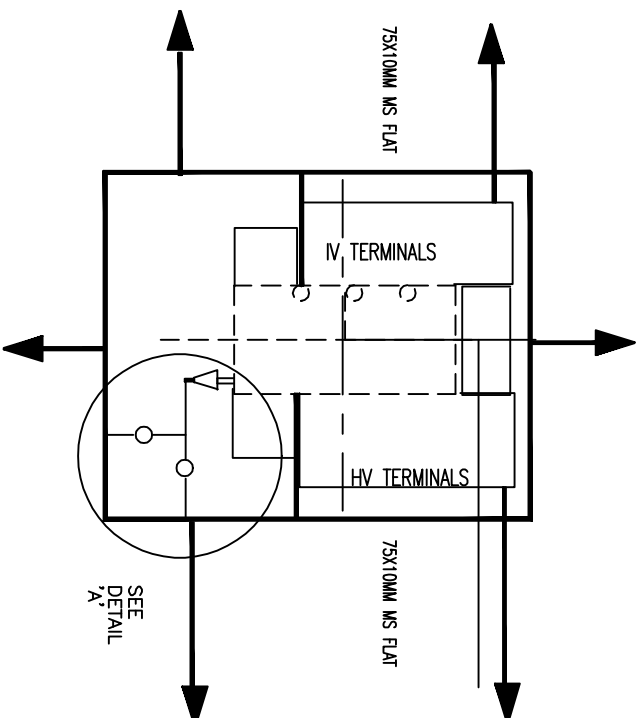
COMPU. DRG. REF.

DRG. NO.

TB-4-325-316-007

REV. 00

SHEET No.
12

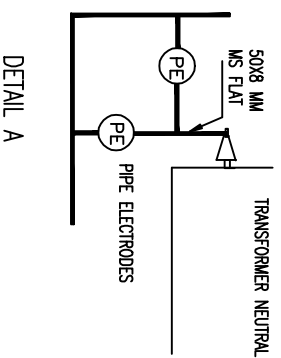
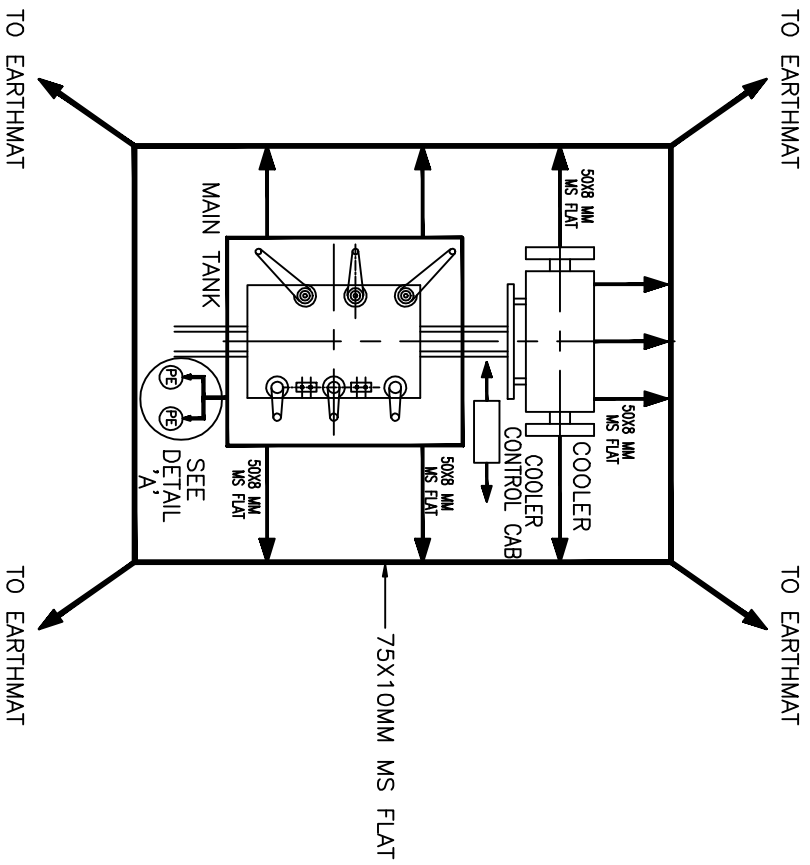


EQUIPMENT EARTHING DETAILS LT TRANSFORMER

DRG. No. TB-4-325-316-007

REV. 00

SHEET No.
13



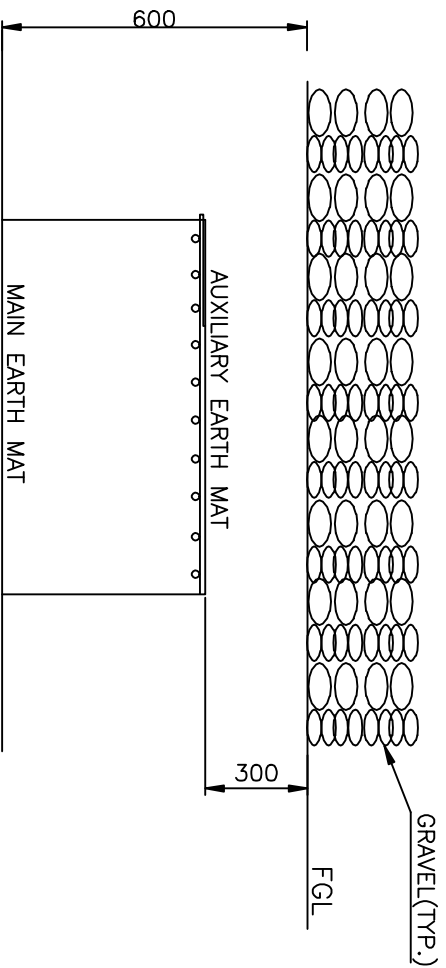
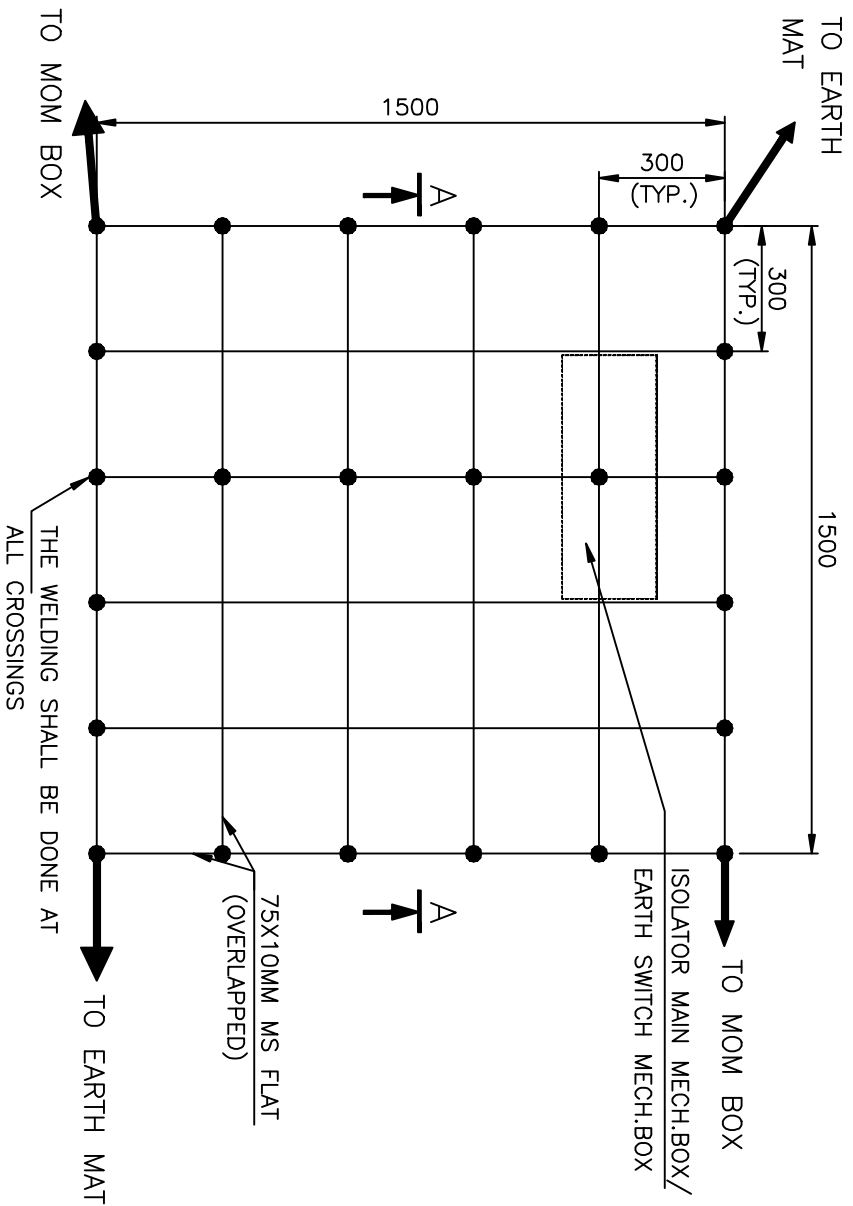
DETAIL A

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 KIOX ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS.



EQUIPMENT EARTHING DETAILS
AUTO TRANSFORMER



NOTE:

SECTION AA

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 THE CABLE TRENCH ROUTING SHALL BE PLANNED ACCORDINGLY.



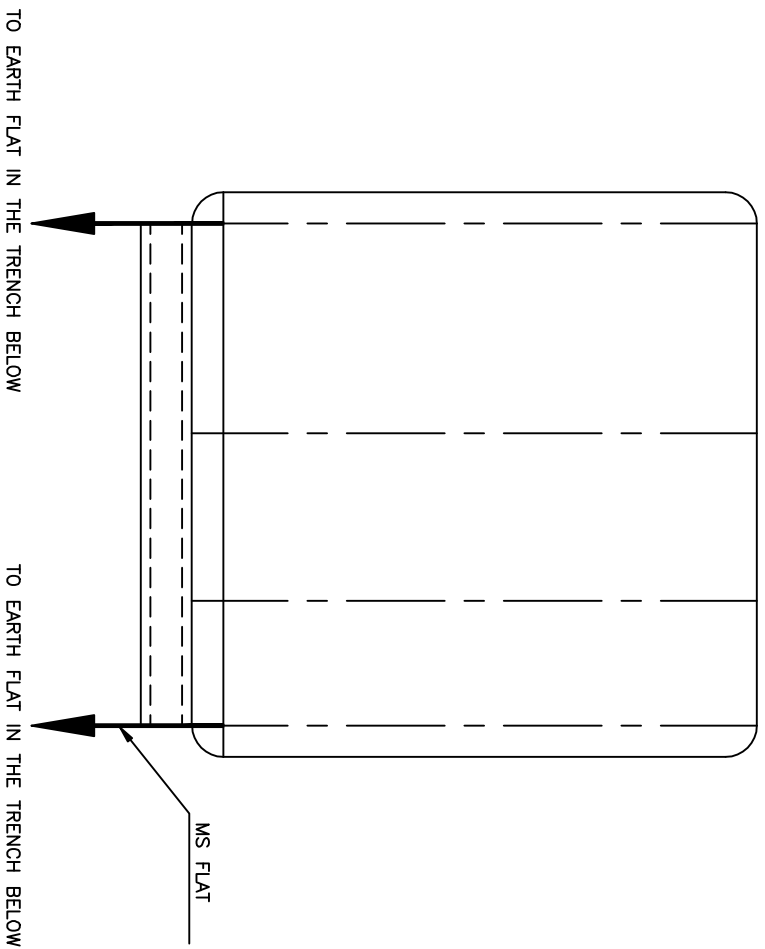
EQUIPMENT EARTHING DETAILS
AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S
MECH. BOX

COMPU. DRG. REF.

Report No. TB-4-325-316-007

REV. 00

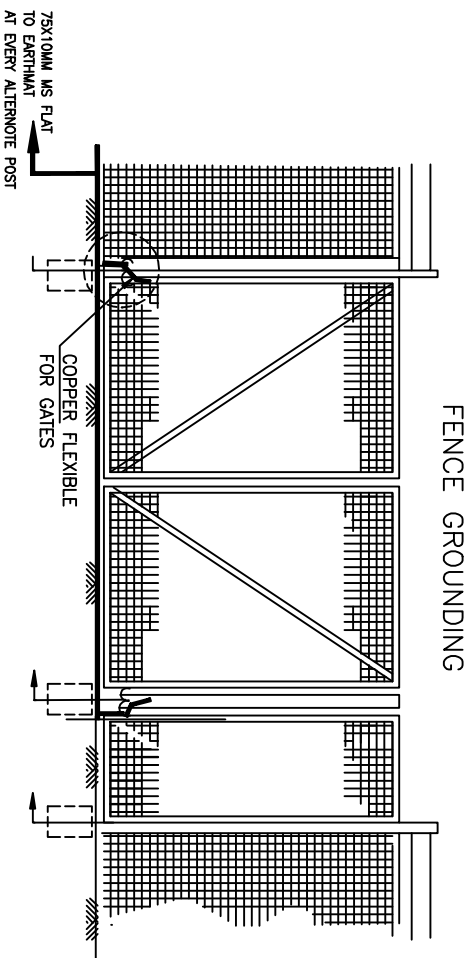
SHEET No.
14



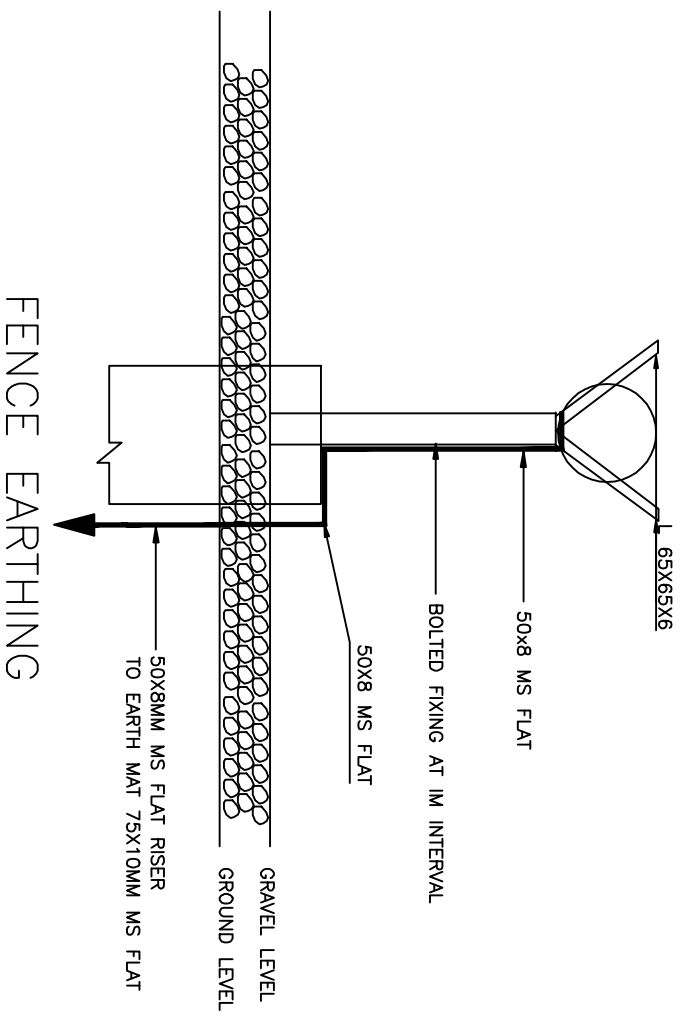
EQUIPMENT	FLAT SIZE
SWITCHGEAR/ MCC	50X8 MM
AC / DC DISTRIBUTION BOARDS	50X8 MM
CONTROL & RELAY PANELS	50X8 MM
AC KIOSK	50X8 MM
NO. OF RISER =2	



EQUIPMENT EARTHING DETAILS
SWITCHGEAR / MCC / CONTROL AND RELAY BOARD/AC KIOSK



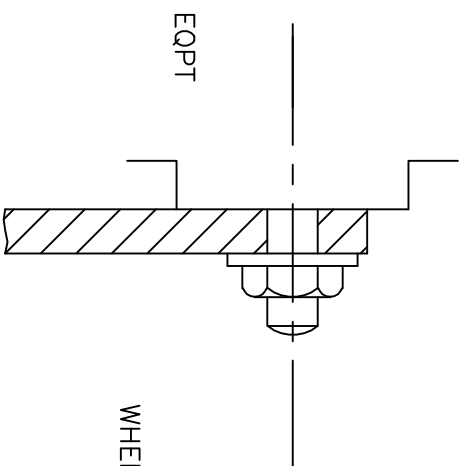
EVERY ALTERNATE FENCE POSTS SHALL BE EARTHED BY 50X8 MM MS FLAT.
50X8 FLAT SHALL BE WELDED TO 65X65X6 ANGLES FORMING V-SHAPE AT THE TOP OF FENCE



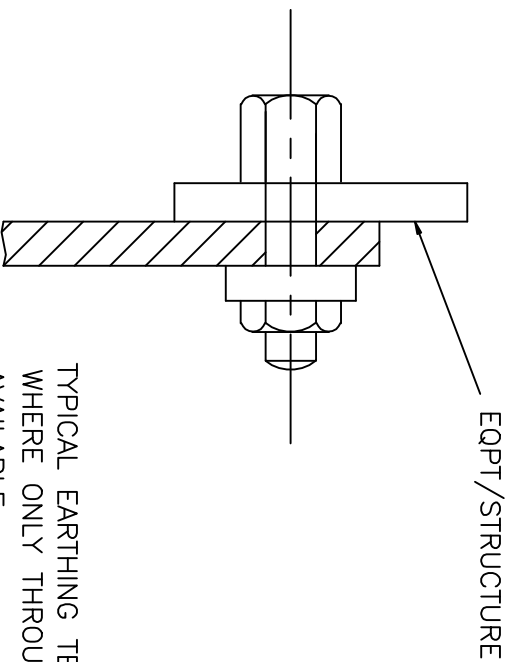
EQUIPMENT EARTHING DETAILS

FENCE POST

DRG. No.	T B-4-325-316-007	REV. 00	SHEET No. 16
----------	-------------------	---------	-----------------



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

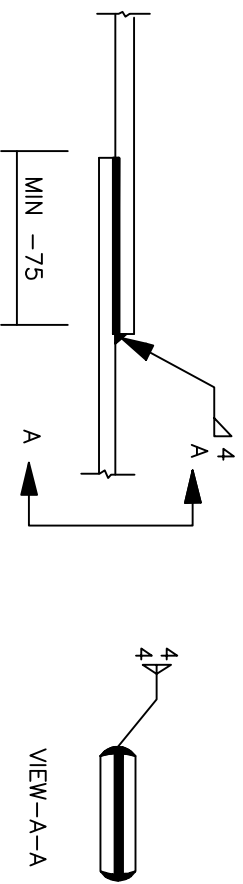


EQUIPMENT EARTHING DETAILS
TYPICAL ARRANGEMENT OF BOLTED JOINTS

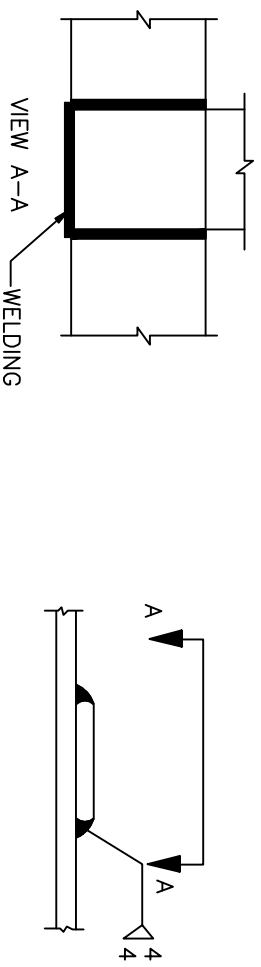
DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 17
----------	------------------	---------	-----------------

STRIP TO STRIP

1. STRAIGHT LAP JOINT/RISER

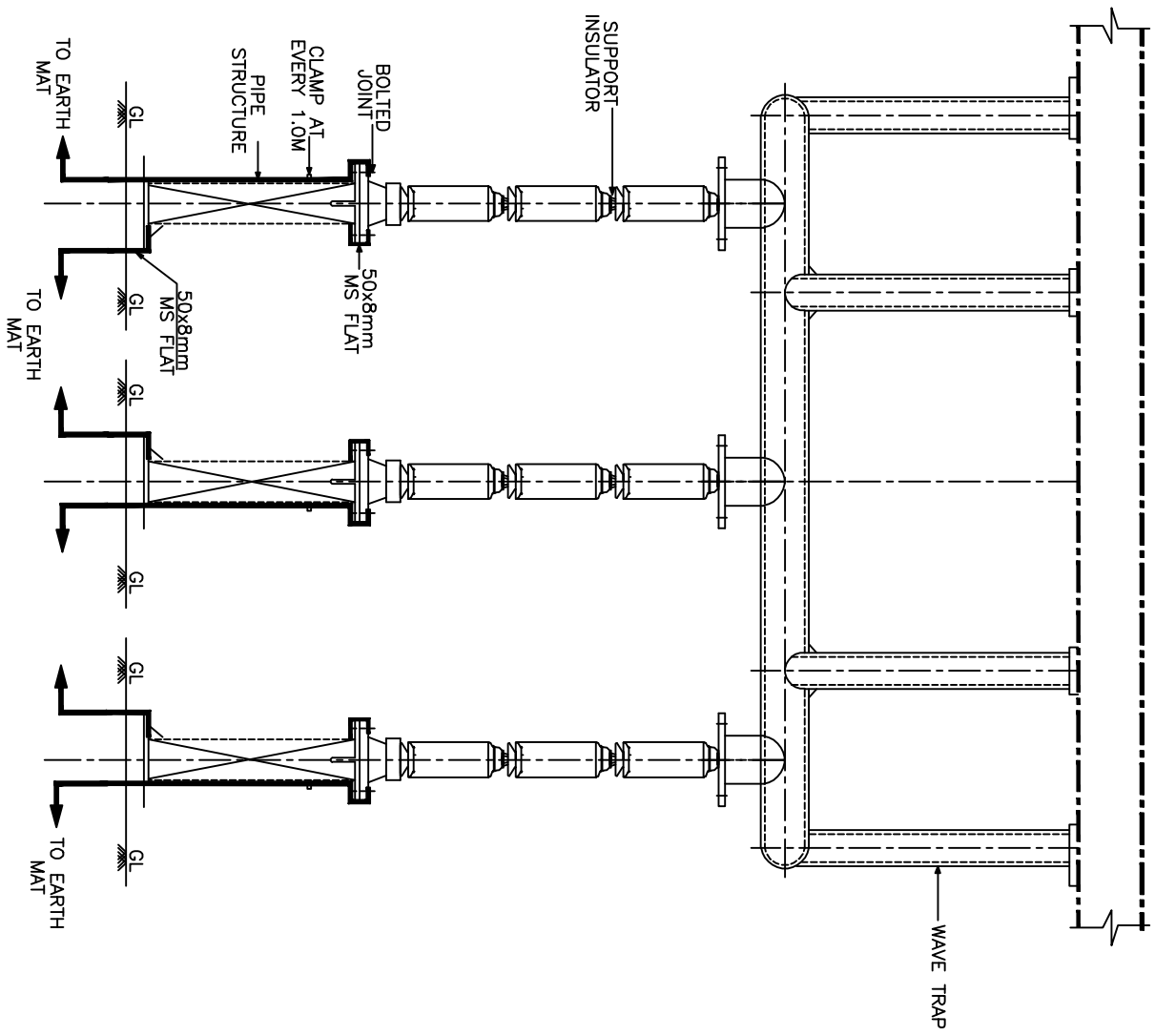


2. CROSS LAP JOINT



EQUIPMENT EARTHING DETAILS
WELDING DETAIL

COMPUTER REF. NO.	DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 18
-------------------	----------	------------------	---------	-----------------



NO. OF RISER=6NO. PER PHASE



EQUIPMENT EARTHING DETAILS 400/220kV WAVE TRAP

COMPUTER REF. NO.	DRG. No.	TB-4-325-316-007	REV. 00	SHEET No. 19
-------------------	----------	------------------	---------	-----------------