

**List of Drawings Enclosed (Annexure A)**

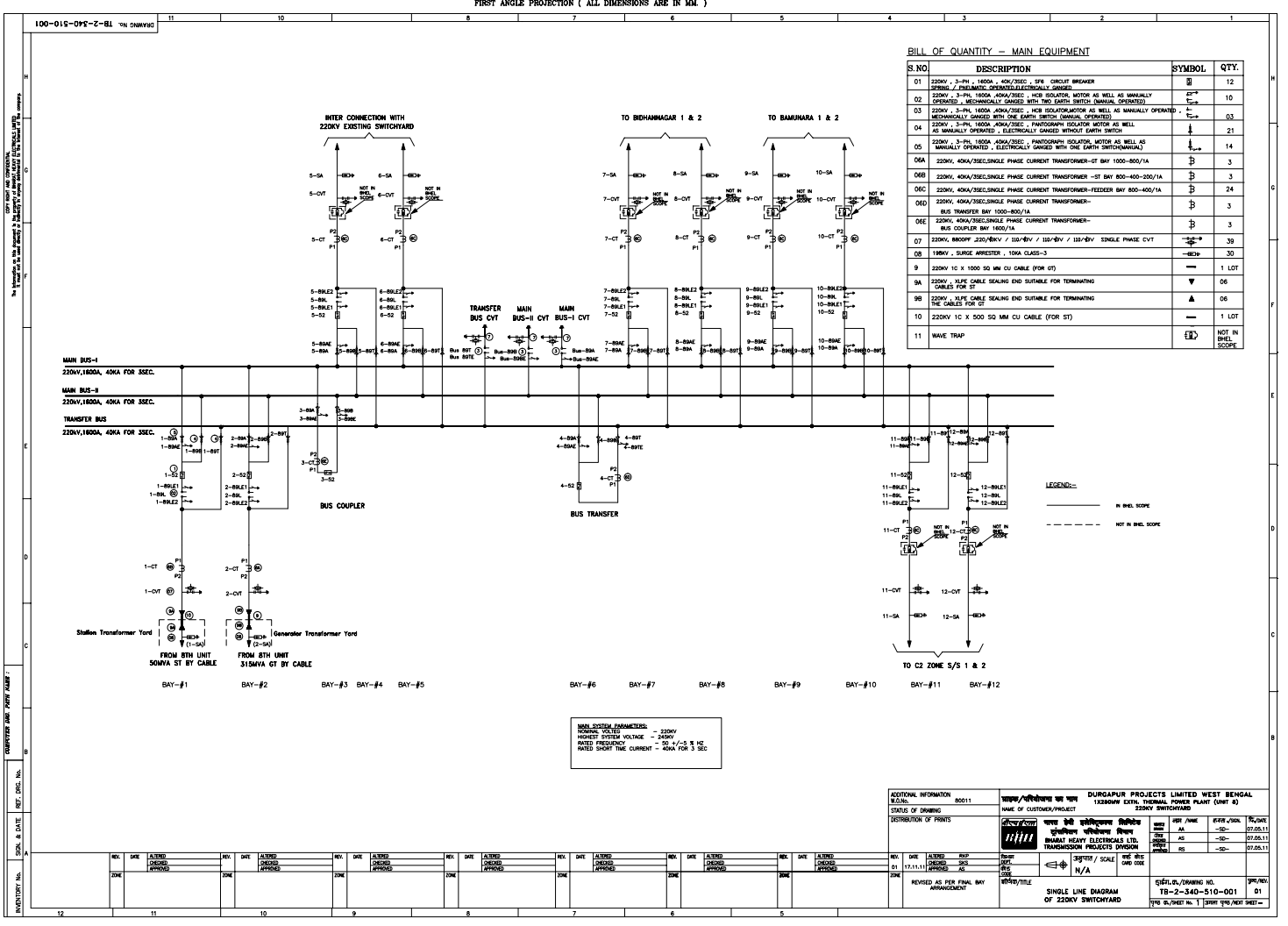
**Project : 220kV Switchyard, Durgapur Extension TPS, 1x250MW(Unit-8)**

**Customer : Durgapur Projects Limited**

<b>S. No.</b>	<b>Title</b>	<b>Drawing No.</b>
1	SLD for 220kV Switchyard	TB-2-340-510-001
2	Layout plan and Section drawing	TB-1-340-316-002 and TB-1-340-316-003
3	Single line diagram of 415V ACDB and 220V DCDB	TB-1-340-316-010
4	Trench Layout	TB-1-340-316-005
5	Erection key diagram (Shall be furnished at execution stage)	TB-3-340-316-014
6	Equipment and structure earthing details	TB-4-340-509-013
7	Trestle / Trench Layout	TB-1-340-316-006

FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM )

100-0151-010-01



BILL OF QUANTITY - MAIN EQUIPMENT

S.NO	DESCRIPTION	SYMBOL	QTY.
01	220KV, 3-PH, 1800A, 40K/SEC, 57K CIRCUIT BREAKER SPRING / PHASING OPERATED/ELECTRICALLY GANGED	CB	12
02	220KV, 3-PH, 1800A, 40K/SEC, - HR ISOLATOR MOTOR AS WELL AS MANUALLY OPERATED, MECHANICALLY GANGED WITH TWO EARTH SWITCH (MANUAL OPERATED)	IS	10
03	220KV, 3-PH, 1800A, 40K/SEC, - HR ISOLATOR MOTOR AS WELL AS MANUALLY OPERATED, MECHANICALLY GANGED WITH ONE EARTH SWITCH (MANUAL OPERATED)	IS	03
04	220KV, 3-PH, 1800A, 40K/SEC, PHOTOGRAPHIC ISOLATOR MOTOR AS WELL AS MANUALLY OPERATED, ELECTRICALLY GANGED WITHOUT EARTH SWITCH	IS	21
05	220KV, 3-PH, 1800A, 40K/SEC, PHOTOGRAPHIC ISOLATOR MOTOR AS WELL AS MANUALLY OPERATED, ELECTRICALLY GANGED WITH ONE EARTH SWITCH(MANUAL)	IS	14
06A	220KV, 40KA/3SEC/SINGLE PHASE CURRENT TRANSFORMER - 1ST BAY 800-400/1A	CT	3
06B	220KV, 40KA/3SEC/SINGLE PHASE CURRENT TRANSFORMER - FEEDER BAY 800-400/1A	CT	3
06C	220KV, 40KA/3SEC/SINGLE PHASE CURRENT TRANSFORMER - BUS TRANSFER BAY 1000-800/1A	CT	24
06D	220KV, 40KA/3SEC/SINGLE PHASE CURRENT TRANSFORMER - BUS COUPLER BAY 1000/1A	CT	3
06E	220KV, 40KA/3SEC/SINGLE PHASE CURRENT TRANSFORMER - BUS COUPLER BAY 1000/1A	CT	3
07	220KV, 1800KV 220V/8KV / 110-8KV / 110-8KV SINGLE PHASE CVT	CVT	39
08	198KV, SURGE ARRESTOR, 10KA CLASS-3	SA	30
9	220KV 1C X 1000 SQ MM CU CABLE (FOR CT)	---	1 LOT
9A	220KV ALUMI CABLE SEALING END SUITABLE FOR TERMINATING CABLES FOR ST	---	06
9B	220KV ALUMI CABLE SEALING END SUITABLE FOR TERMINATING CABLES FOR ST	---	06
10	220KV 1C X 500 SQ MM CU CABLE (FOR ST)	---	1 LOT
11	WAVE TRAP	WT	NOT IN BREL SCOPE

MAIN SYSTEM PARAMETERS:  
 NOMINAL VOLTAGE - 220KV  
 HIGHEST SYSTEM VOLTAGE - 240KV  
 RATED FREQUENCY - 50 Hz / -0.5 Hz  
 RATED SHORT TIME CURRENT - 40KA FOR 3 SEC

ADDITIONAL INFORMATION: 80011

DATE OF DRAWING: 17.11.11

DESIGNER: [Signature]

CHECKED: [Signature]

APPROVED: [Signature]

PROJECT: DURGAPUR PROJECTS LIMITED WEST BENGAL  
 12300WV EXTRA THERMAL POWER PLANT (UNIT 2)  
 220KV SWITCHYARD

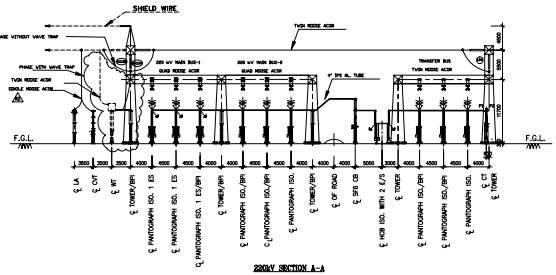
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DATE: 17.11.11

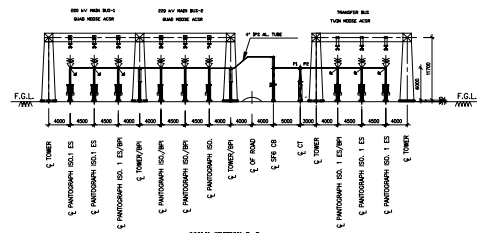
PROJECT NO: TB-2-340-510-001

SHEET NO: 01

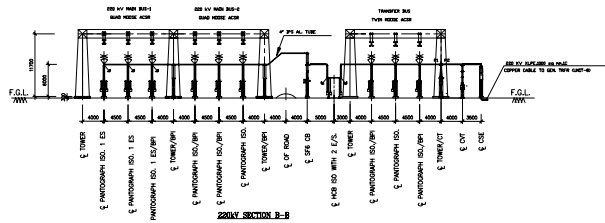




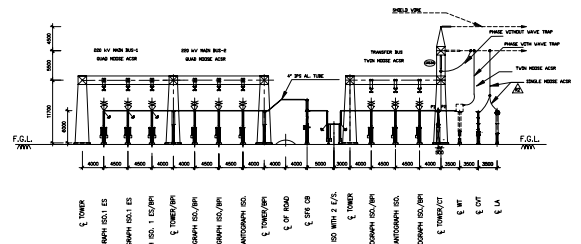
**220KV SECTION A-A**  
(LINES - INTERCONNECTION WITH 220KV EXISTING 5/7, BIRHANGAR -1/2, BANURARA -1/2)



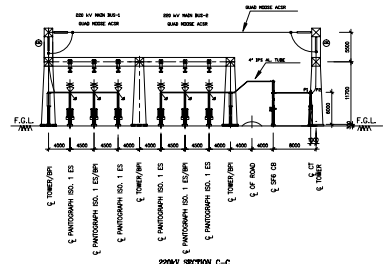
**220KV SECTION D-D**  
(BUS TRANSFER)



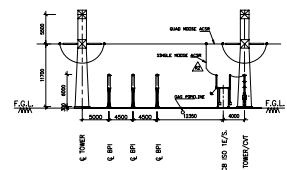
**220KV SECTION B-B**  
(GT & ST BAY)



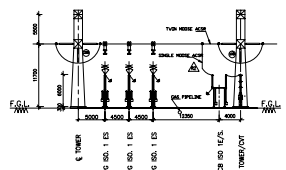
**220KV SECTION E-E**  
(220KV LINE TO C2 ZONE 5/3 -1/2)



**220KV SECTION C-C**  
(BUS COUPLER BAY)



**220KV SECTION F-F**  
(TRANSFER BUS ACROSS GAS PIPE LINE)



**220KV SECTION G-G**  
(TRANSFER BUS ACROSS GAS PIPE LINE)

**NOTES-**  
1. ALL DIMENSIONS ARE IN MM.

MINIMUM CLEARANCE TABLE		220KV
PHASE TO PHASE (PP)		2400
PHASE TO GROUND (PG)		2100
SECTOR CLEARANCE (SC)		2000
CLEARANCE FROM TOP OF INSULATOR SUPPORTING LINE CONDUCTORS FROM GROUND		2400
HEIGHT OF AL TUBE (GAS PIPE LINE FROM PLUMB LEVEL)		6000
PLUMB LEVEL		300

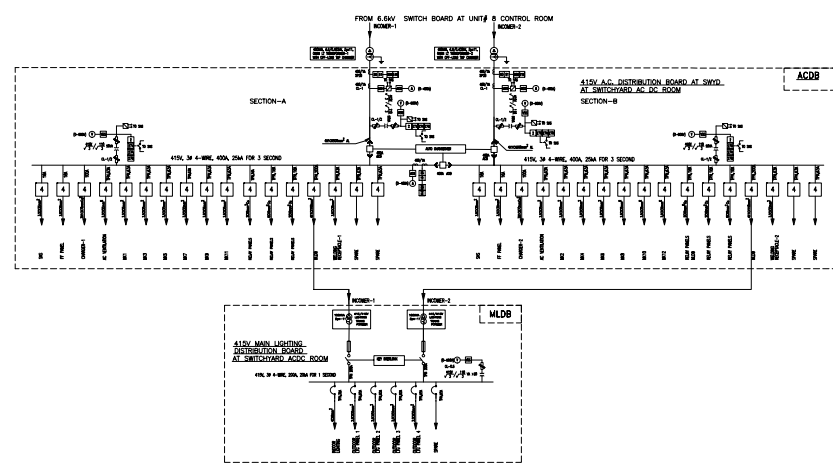
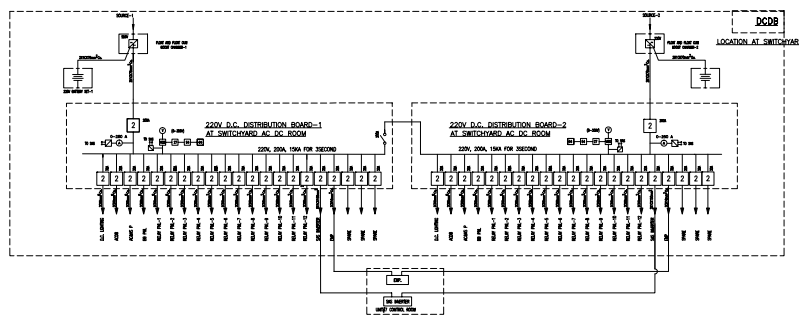
**REFERENCE DRAWING**  
1. 220KV SWITCHYARD SLD - TB-3-340-510-001  
2. 220KV SWITCHYARD LAYOUT - TB-1-340-316-002

**LEGEND:-**  
—— IN BHSL SCOPE  
----- NOT IN BHSL SCOPE

PROJECT NUMBER	80011	NAME OF CONTRACTOR	DURGAPUR PROJECTS LIMITED WEST BENGAL
SCALE OF DRAWING	AS SHOWN	DATE OF DRAWING	1 X 10000
DATE OF ISSUE	15/01/2011	DESIGNED BY	SRINIVAS
APPROVED BY		CHECKED BY	
DRAWN BY		DATE	
PROJECT TITLE		SECTIONAL ELEVATION FOR 220KV SWITCHYARD AT BIRHANGAR	
DRAWING NO.		TB-1-340-316-002	
SCALE		AS SHOWN	

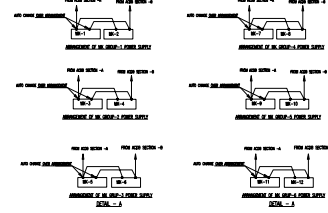
FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

DRAWING NO. TB-1-340-316-010



- LEGEND:-**
- DRAW OUT TYPE AIR CIRCUIT BREAKER
  - CONTROL FUSE
  - ⊖ NON DRAW OUT AIR BREAK SWITCH
  - 4 POLE MCCB
  - 2 POLE MCCB
  - TPN SWITCH FUSE UNIT
  - MCCB
  - TRANSFORMER, 4-20 MVA DUAL OUTPUT
- 50N :** INSTANTANEOUS EARTH FAULT RELAY  
**50 :** INSTANTANEOUS OVER CURRENT RELAY  
**51 :** DOUBLE POLE INVERSE DEFERRED MINIMUM TIME OVER CURRENT RELAY  
**51N :** INVERSE DEFERRED MINIMUM TIME EARTH FAULT RELAY  
**2 :** TIME DELAY PICKUP RELAY  
**27K :** AC DOUBLE POLE INSTANTANEOUS UNDER VOLTAGE RELAY  
**27 :** DC INSTANTANEOUS UNDER VOLTAGE RELAY  
**24 :** DC INSTANTANEOUS OVER VOLTAGE RELAY  
**64 :** EARTH LEAKAGE RELAY  
**V :** VOLTMETER  
**A :** AMMETER  
**VSS :** VOLTAGE SELECTOR SWITCH  
**ASS :** AMMETER SELECTOR SWITCH  
**TPN :** THREE POLE WITH SEPARATE NEUTRAL LINK  
**MK :** MARSHALLING KIOSK  
**SAS :** SUBSTATION AUTOMATION SYSTEM

- NOTES:-**
1. NO TWO AC SOURCE SHALL BE PARALLELED AT ANY STAGE.
  2. IN THE ABSENCE OF ONE INCOMER SOURCE SECOND INCOMER SOURCE SUPPLY SHALL BE STARTED AUTOMATICALLY SUCH THAT TWO OUT OF THREE BREAKER SHALL BE CLOSED AT A TIME.
  3. EACH BAY MK SHALL BE FED BY ATLEAST ONE SOURCE FROM ACDB. SECOND SOURCE SHALL BE LOADED FROM INCOMER BAY WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V ACDB(SEE DETAIL A FOR MK SUPPLY).
  4. EACH BAY SHALL HAVE INCOMER MK.
  5. ALL CABLES FOR INCOMER AND OUTGOING SHALL BE OF AL CONDUCTOR IF NOT SPECIFIED.
  6. STATUS OF ALL INCOMER AND BUS COUPLER SHALL BE AVAILABLE FOR SAS.
  7. TRANSFORMER FOR MEASUREMENT OF CURRENT AND VOLTAGE OF BATTERY & CHARGER SHALL BE LOCATED IN RESPECTIVE CHARGER & SAME SHALL BE INTERLOCKED TO SAS.
  8. BUS-BAY MATERIAL SHALL BE COPPER.
  9. DEGREE OF PROTECTION FOR PANELS SHALL BE IP-20.
  10. TIMER CONTACTORS SHALL BE PROVIDED IN MLDL.



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COMPUTER AIDED PARTIAL DRAWING :  
 SIGN. & DATE REF. DRG. No. INVENTORY No.

REV.	DATE	ALTERED BY	APPROVED	REV.	DATE	ALTERED BY	APPROVED
01	07.10.11	CHOKER	AS				

ADDITIONAL INFORMATION ECLD No. 80011	NAME OF CUSTOMER/PROJECT DURGAPUR PROJECTS LIMITED WEST BENGAL 220KV SWITCHYARD, 1X250MW EXTN. THERMAL POWER PLANT (UNIT 8)
STATUS OF DRAWING DISTRIBUTION OF PRINTS	DATE / TIME / SCALE 01 / 422 / 1:1
REV. DATE ALTERED BY APPROVED AS	DATE / TIME / SCALE 01 / 422 / 1:1
SHEET NO./DRAWING NO. TB-1-340-316-010	
LT AUX. ACDC POWER DISTRIBUTION	



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**LEGEND**

- CONNECTION TO GROUND MAT THROUGH RISER.
- ⊗ PE CONNECTION TO PIPE ELECTRODE WITH TREATED EARTH PIT.
- RISER

**GENERAL NOTES:**

1. EARTH STRIP CLEATED TO LATTICE /PIPE TYPE STRUCTURE AT AN INTERVAL OF 1000mm.
2. ALL ELECTRICAL EQUIPMENTS SHALL BE EARTHED BY TWO SEPARATE AND DISTINCT EARTH CONNECTIONS.
3. FOR WELDING DETAILS REFER SHEET #18, 19 & 20
4. E/WIRE DOWN CONDUCTOR SHALL BE CLEATED AT AN INTERVAL OF 2000mm ALONG WITH STRUCTURE.

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
02.	220KV SF6 CIRCUIT BREAKER	12.	RAIL BONDING
03.	220KV CVT	13.	LT TRANSFORMER
04.	220KV POST INSULATOR (SOLID CORE TYPE)	14.	AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH., E/S MECH. BOX.
05.	198KV LIGHTNING ARRESTER	15.	SWITCHGEAR / MCC /RELAY PANEL
06.	MARSHALLING KIOSK	16.	FENCE POST
07.	220KV HORIZONTAL CENTER BREAK ISOLATOR WITH ONE EARTH SWITCH	17.	TYPICAL ARRANGEMENT OF BOLTED JOINTS
7A.	220KV HORIZONTAL CENTER BREAK ISOLATOR WITH TWO EARTH SWITCH	18.	WELDING DETAILS
08.	TOWER WITH SHIELD WIRE	19.	WELDING DETAILS
08A.	TOWER WITHOUT SHIELD WIRE	20.	WELDING DETAILS
09.	220KV CURRENT TRANSFORMER	21.	220KV PANTOGRAPH ISOLATOR WITH ONE ES
10.	CABLE TRENCH	22.	220KV CABLE SEALING END
11.	DETAIL OF PIPE EARTH ELECTRODE IN TREATED EARTH PIT (ET)		

01			WELD THICKNESS INCREASED AS PER DPL COMMENT.	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	06/02/12
REV.	STATUS	TYPE	REASONS FOR REVISION	PREPARED BY	CHECKED BY	APPROVED BY	DATE

COMPUTER DRG. PATH NAME :

NAME OF CUSTOMER  
**DURGAPUR PROJECTS LTD. WB**

परियोजना का नाम 220KV SWITCHYARD, DURGAPUR  
NAME OF PROJECT EXTENSION TPS, 1X250MW (UNIT-8)

SIGN & DATE (REF. DRG. NO.)

	<b>भारत हेवी इलेक्ट्रिकल्स लिमिटेड</b> <b>दांसमिशन परियोजना विभाग</b> <b>BHARAT HEAVY ELECTRICALS LTD.</b> <b>TRANSMISSION BUSINESS GROUP</b>	NAME	SIGN.	DATE	
		DWN	RKP	-Sd-	
		PRPD.	RKP	-Sd-	
		CHKD.	SKS	-Sd-	
		APPD.	AS	-Sd-	

INVENTORY NO.

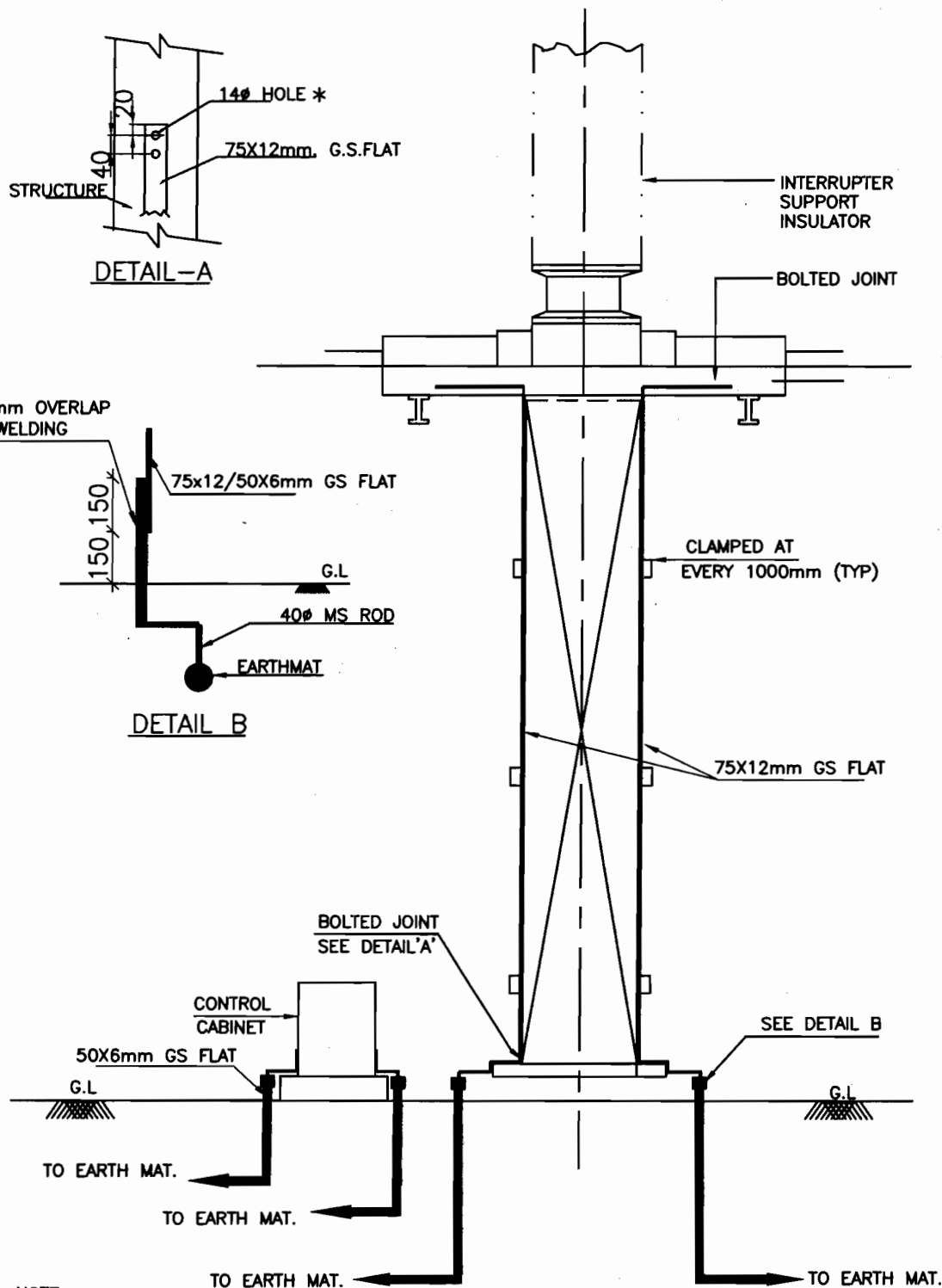
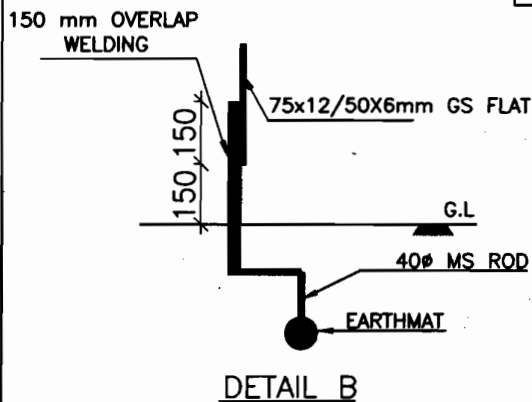
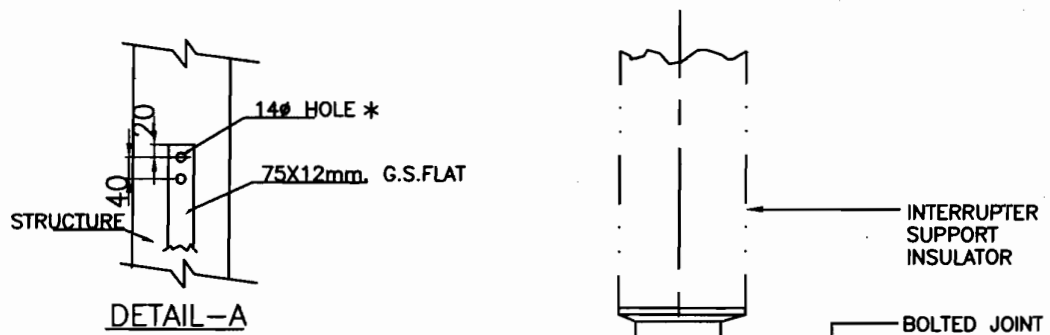
BHEL SUB VENDORS

DEPT.	TBEM
CODE	422
SCALE	NTS
CARD CODE	
W.O. No.	80011

SHEET NO. 1 NEXT SHEET NO. 2

DRAWING TITLE: **EQUIPMENT & STRUCTURE EARTHING DETAILS**

DRWG. NO: **TB-4-340-509-013** REV 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.



## EQUIPMENT EARTHING DETAILS

### 220kV SF6 CIRCUIT BREAKER

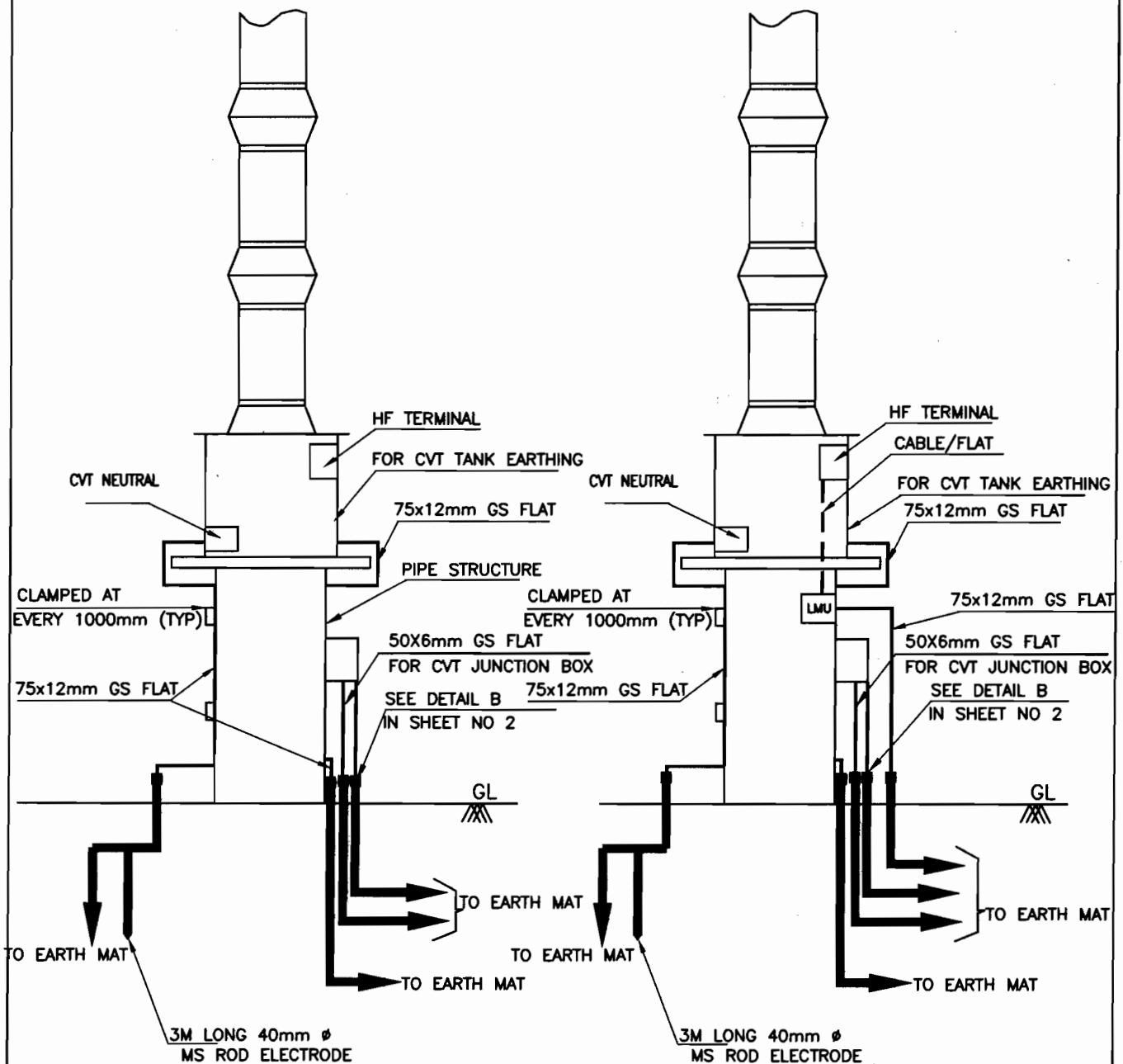
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
2



(CVT WITHOUT LINE MATCHING UNIT CONNECTION)

(CVT WITH LINE MATCHING UNIT CONNECTION)

NOTE:

- (1) ROD ELECTRODE = 1 NOS./PHASE
- (2) NO. OF RISERS = 2 NOS PER PHASE FOR CVT WITHOUT LMU.
- (3) NO. OF RISERS = 3 NOS PER PHASE FOR CVT WITH LMU.
- (4) NO. OF RISERS FOR CVT JUNCTION BOX = 2 NOS.



EQUIPMENT EARTHING DETAILS

220KV CVT

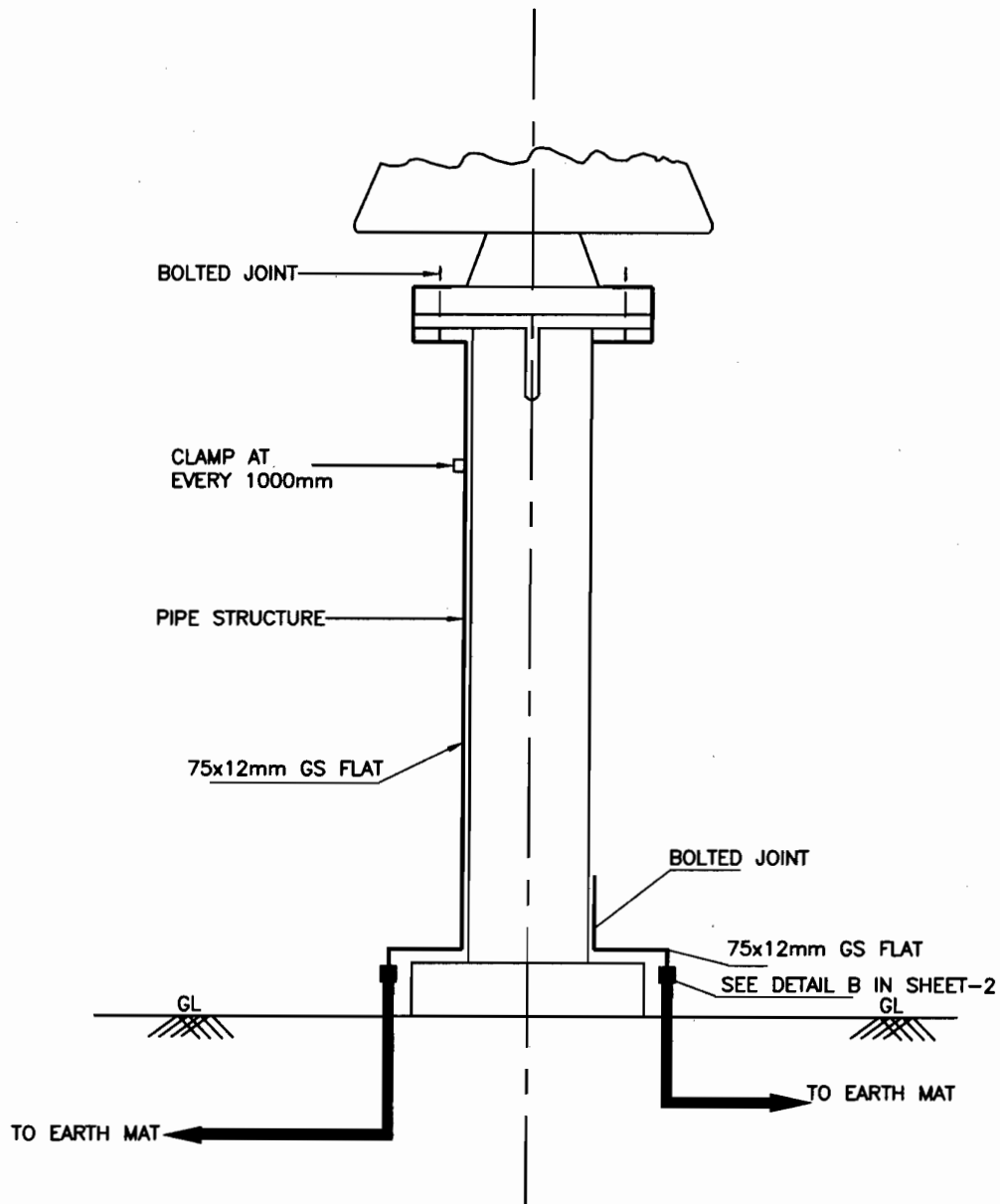
COMPUTER REF. NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
3



NOTE:

(1) NO. OF RISERS = 2 NOS./PHASE

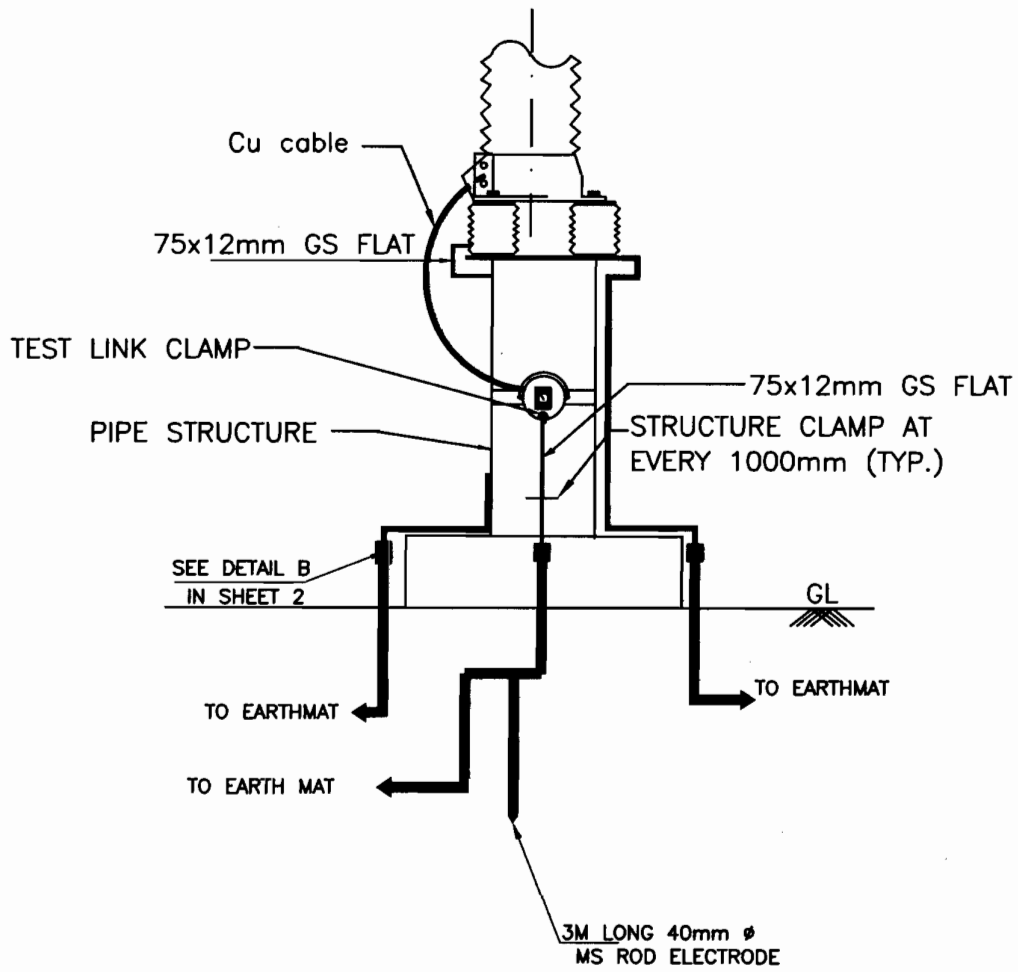


EQUIPMENT EARTHING DETAILS  
 220KV POST INSULATOR (SOLID CORE TYPE)

DRG. No. TB-4-340-509-013

REV. 01

SHEET No. 4



NOTES;

1. LA SHALL BE EARTHED THROUGH EARTH TERMINAL OF SURGE COUNTER
2. NO. OF ROD ELECTRODE 1 NO. PER PHASE,
3. TEST LINK SHALL HAVE PROVISION TO BOLT TEST LEAD BEFORE ISOLATING THE MAIN EARTHING CONNECTIONS.
4. NO. OF RISERS= 3 NOS. PER PHASE



EQUIPMENT EARTHING DETAILS  
LIGHTNING ARRESTER(198kv)

COMPU. DRG. REF.

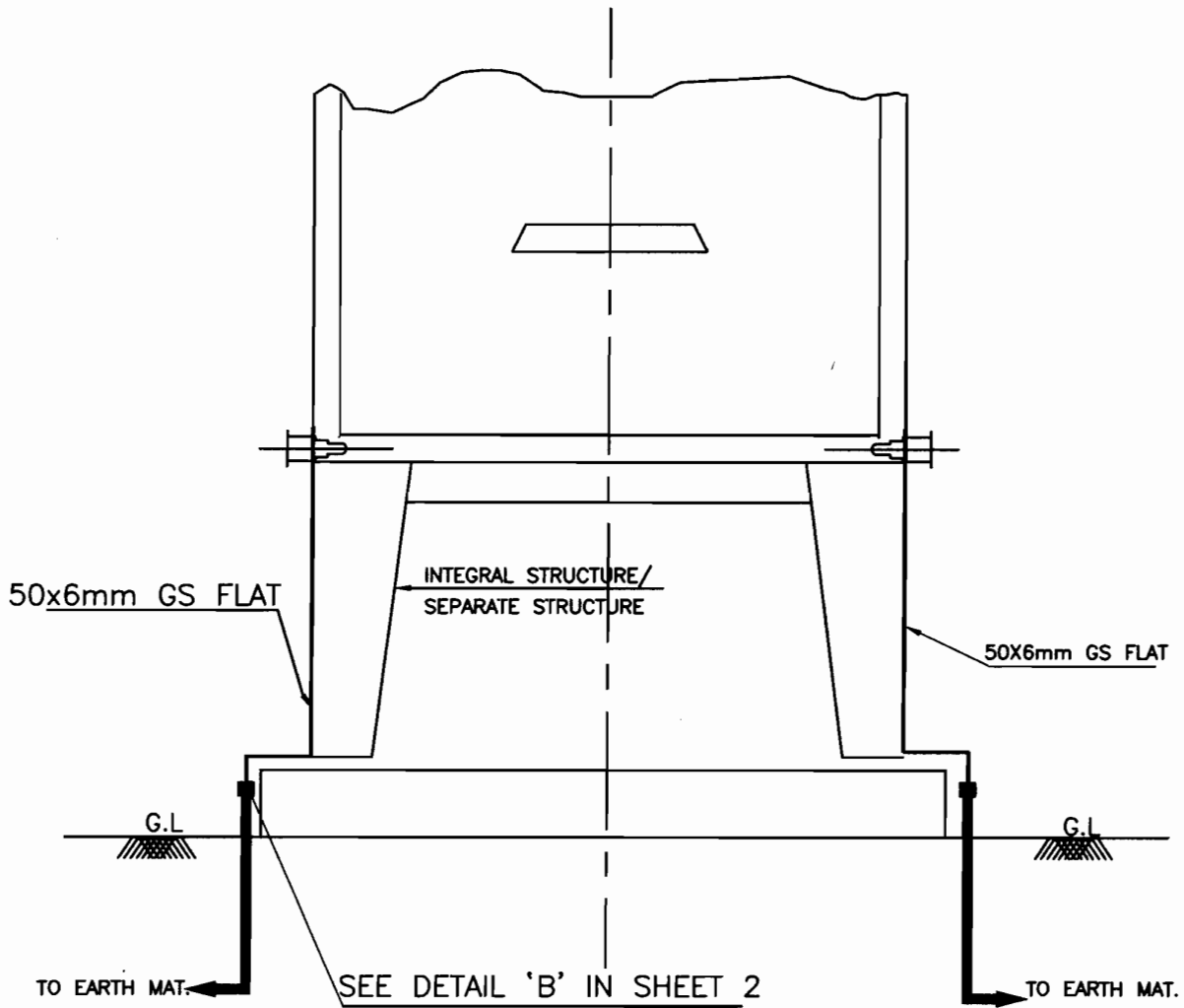
DRG.NO.

TB-4-340-509-013

REV. 01

SHEET No.

5



NOTES;  
 (1).NO. OF RISERS= 2NOS.



EQUIPMENT EARTHING DETAILS  
 MARSHALLING KIOSK

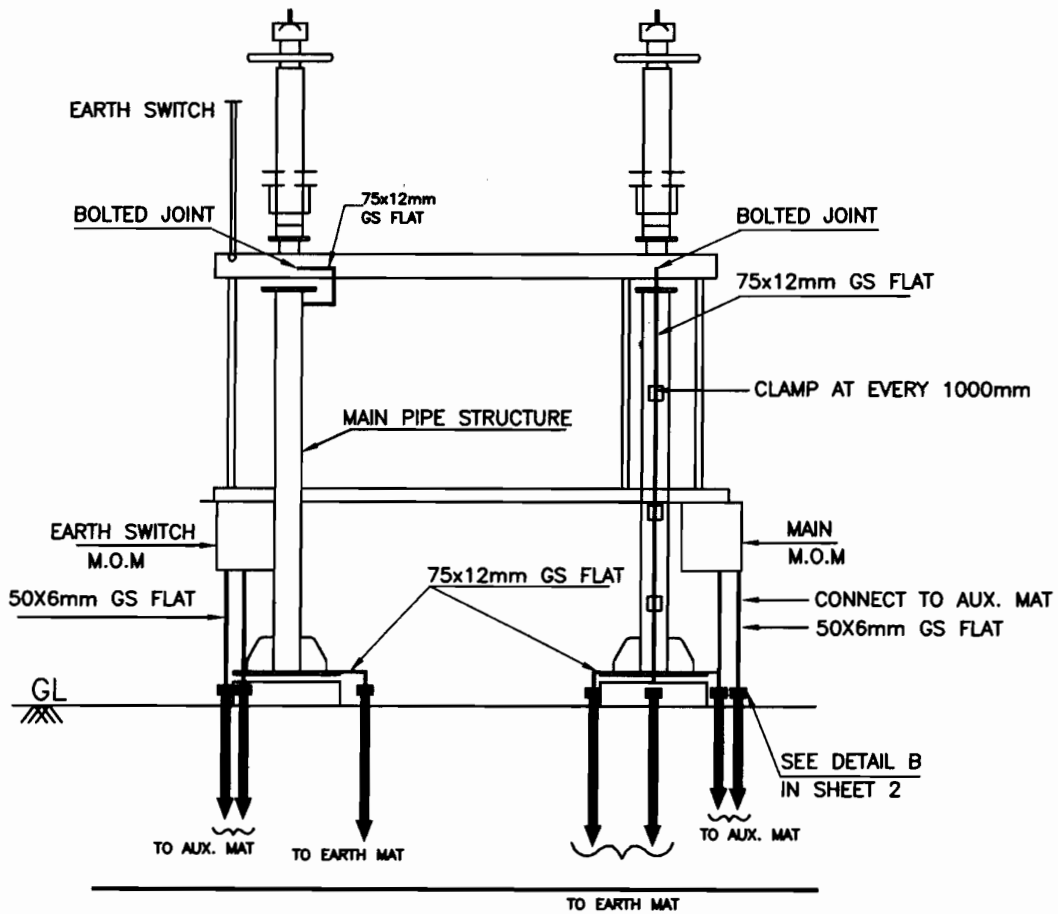
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
 6



**NOTES**

1. AUXILIARY EARTH MAT SHALL BE PROVIDED BELOW EVERY MOM BOX (REFER SHEET 14)
2. NO. OF RISERS FOR ISOLATOR = 3 NOS./PHASE
3. NO. OF RISERS FOR MAIN MECHANISM BOX = 2 NOS.
4. NO. OF RISERS FOR EARTH SWITCH MECHANISM BOX = 2 NOS.



EQUIPMENT EARTHING DETAILS  
220KV HCB  
ISOLATOR (TYPICAL) WITH ONE EARTH SWITCH

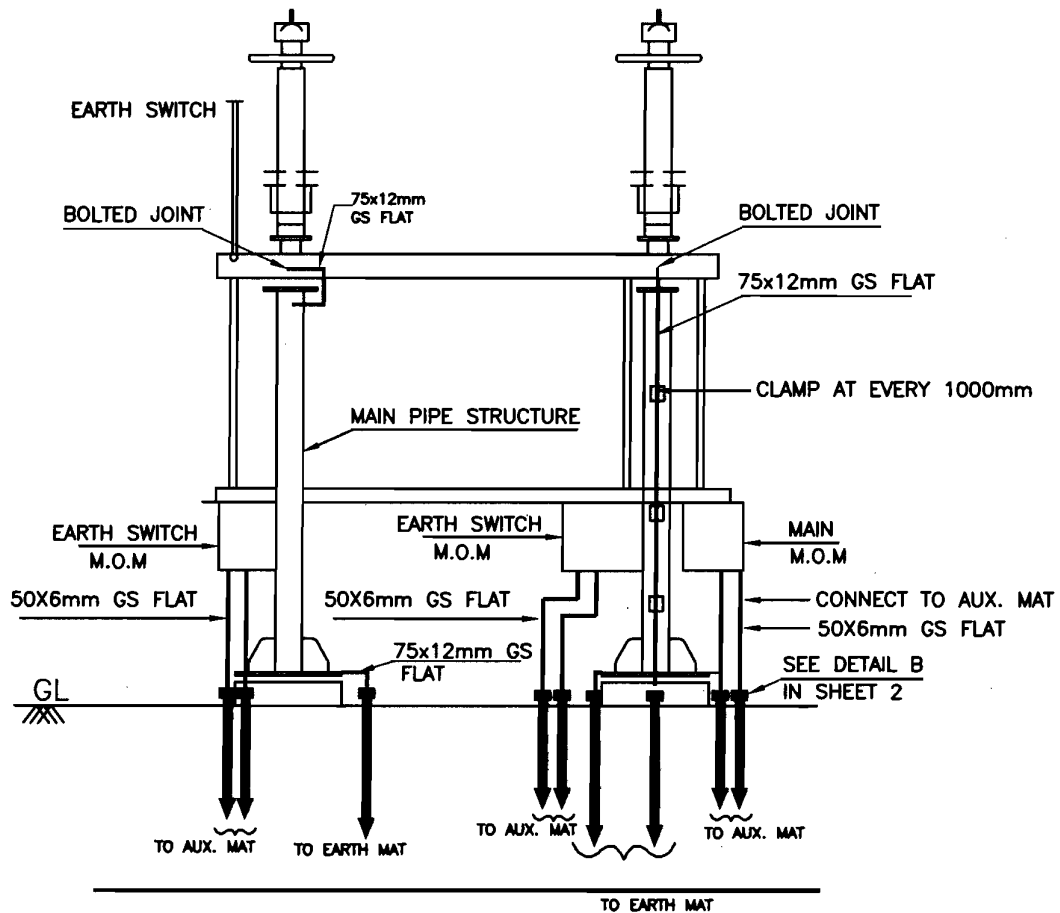
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
7



**NOTES**

1. AUXILIARY EARTH MAT SHALL BE PROVIDED BELOW EVERY MOM BOX. (REFER SHEET 14)
2. NO. OF RISERS FOR ISOLATOR = 3 NOS./PHASE
3. NO. OF RISERS FOR MAIN MECHANISM BOX = 2 NOS.
4. NO. OF RISERS FOR EARTH SWITCH MECHANISM BOX = 2 NOS.



**EQUIPMENT EARTHING DETAILS**  
 220KV HCB  
 ISOLATOR (TYPICAL) WITH TWO EARTH SWITCH

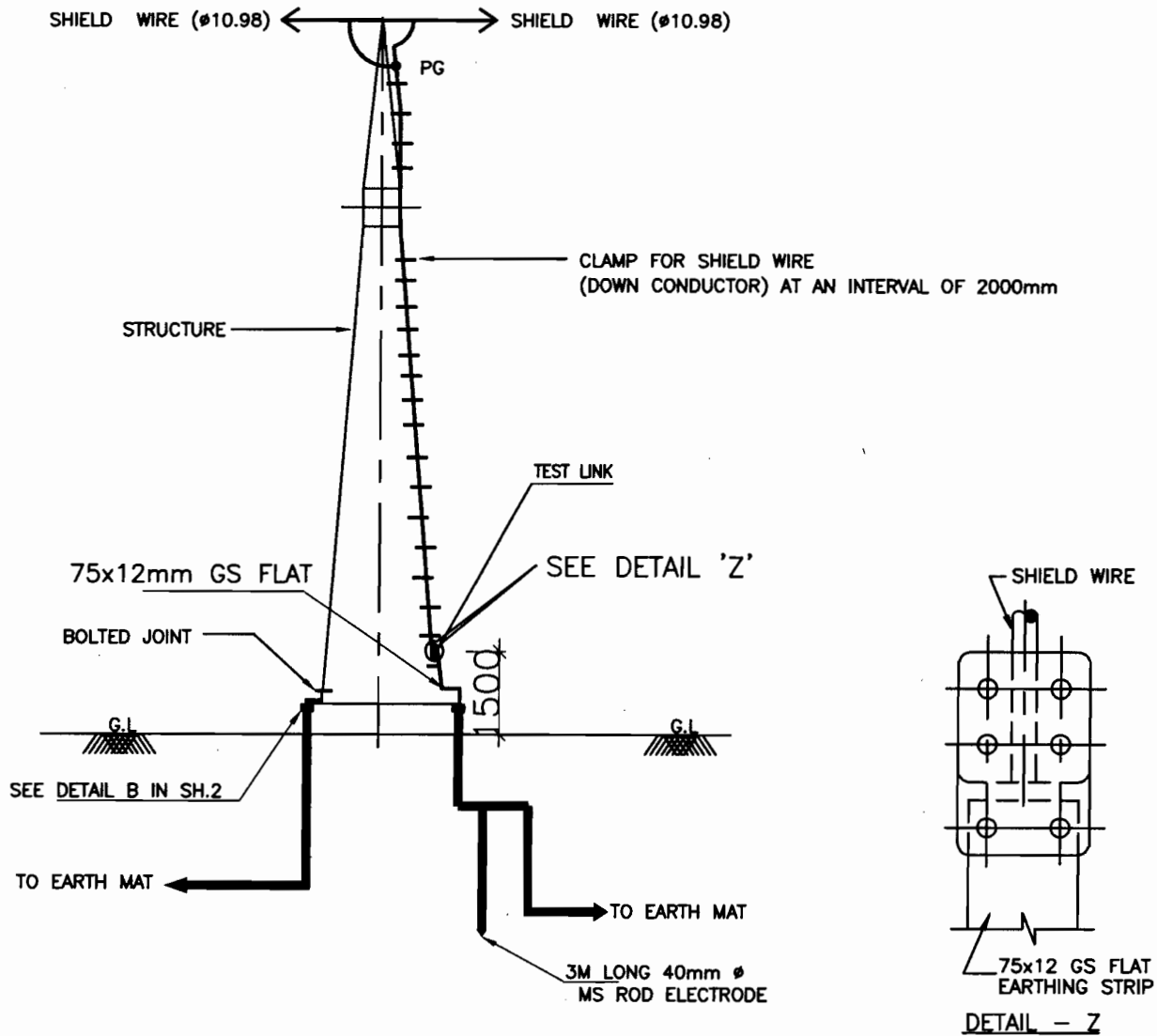
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
7A



NOTE:

1. NO. OF ROD ELECTRODE : 1 NO. PER TOWER WITH DOWN CONDUCTOR.
2. NO. OF RISERS 2 NOS. / TOWER



EQUIPMENT EARTHING DETAILS  
TOWER WITH SHIELD WIRE

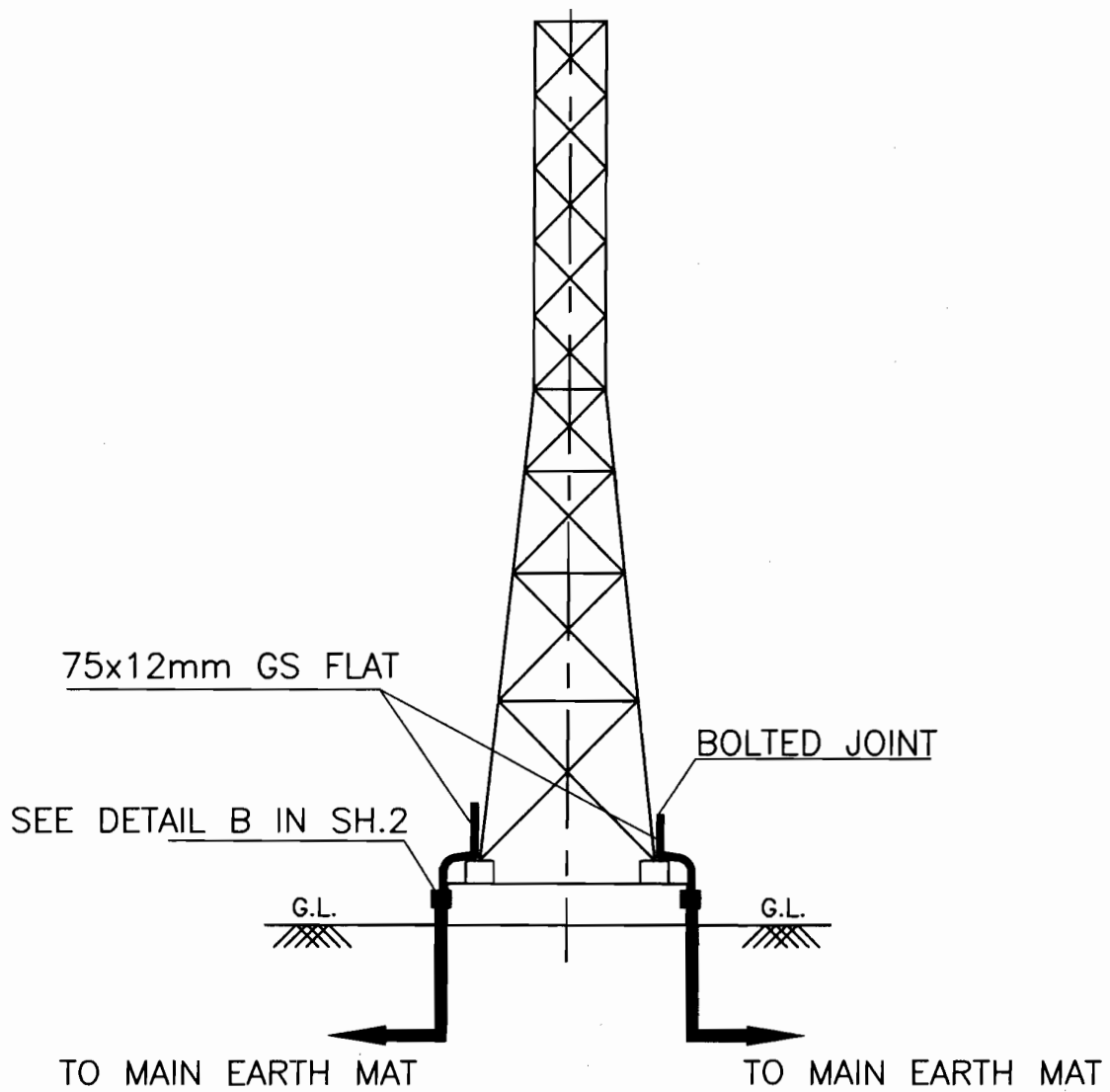
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
8



NOTE:

1. NO. OF RISERS=2 NOS. PER TOWER



EQUIPMENT EARTHING DETAILS  
TOWER WITHOUT SHIELD WIRE

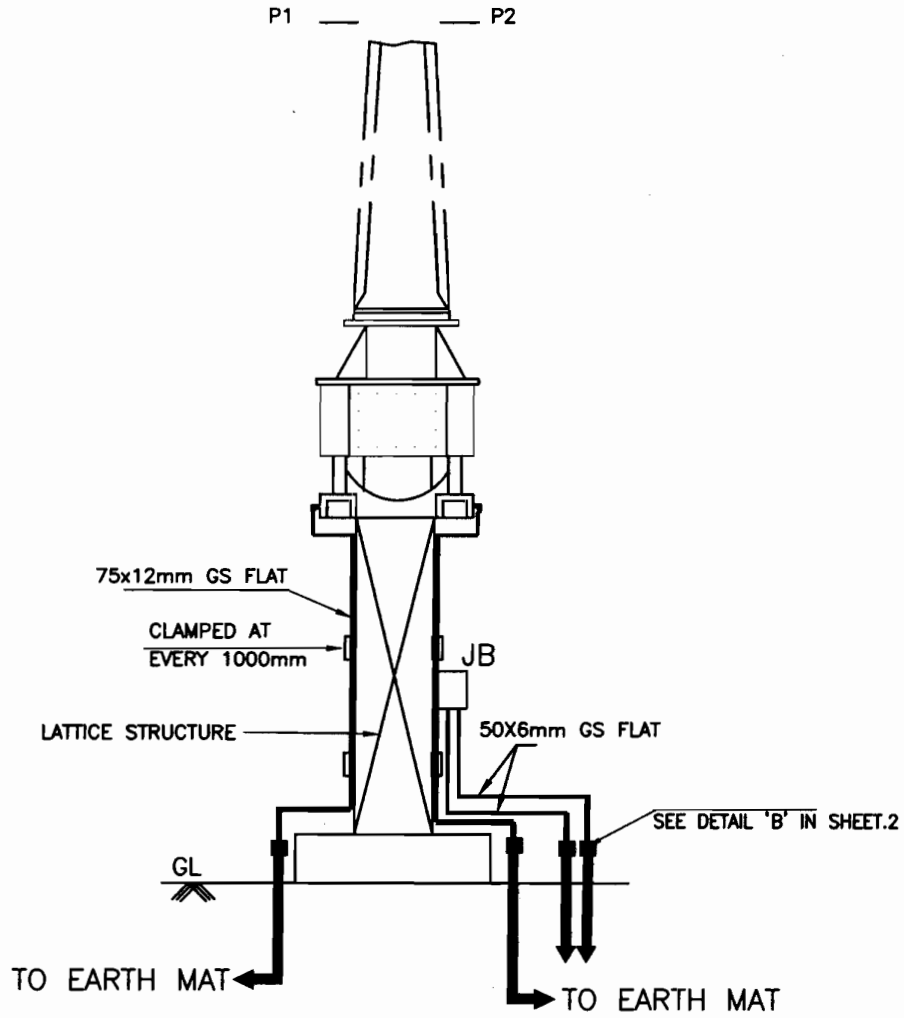
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
8A



NOTE:

1. NO. OF RISERS=2 NOS./PHASE
2. NO. OF RISERS FOR JUNCTION BOX=2 NOS.



EQUIPMENT EARTHING DETAILS  
220KV CURRENT TRANSFORMER

COMPU. DRG. REF.

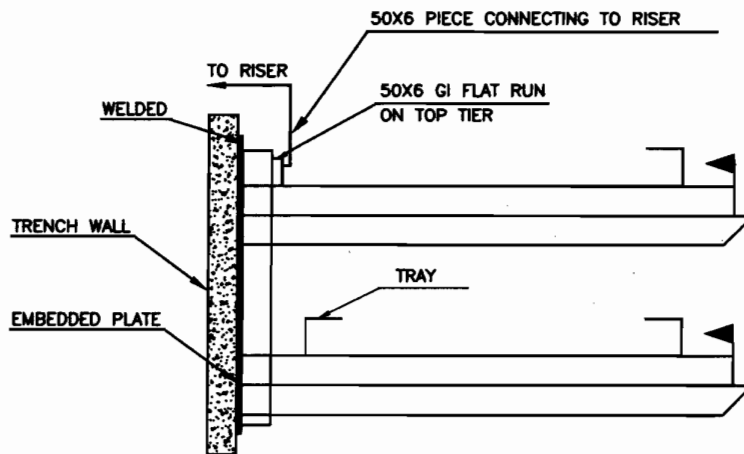
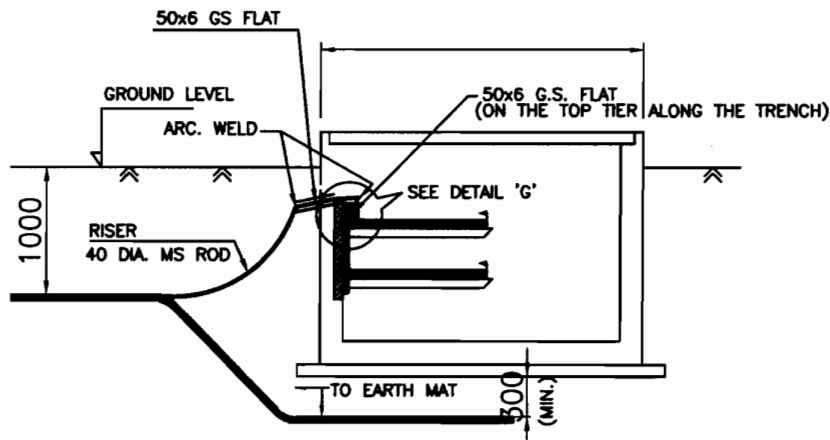
DRG.NO.

TB-4-340-509-013

REV. 01

SHEET No.

9



DETAIL 'G'

DETAIL FOR CONNECTING GI 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 G.S. FLAT) SHALL RUN ON THE TOP TIER ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACK AT EVERY 0.750M INTERVAL.
3. WHERE THE CABLE RACKS ARE PROVIDED ON BOTH SIDES OF THE TRENCH, BOTH SIDES SHALL BE EARTHED.



EQUIPMENT EARTHING DETAILS  
CABLE TRENCH

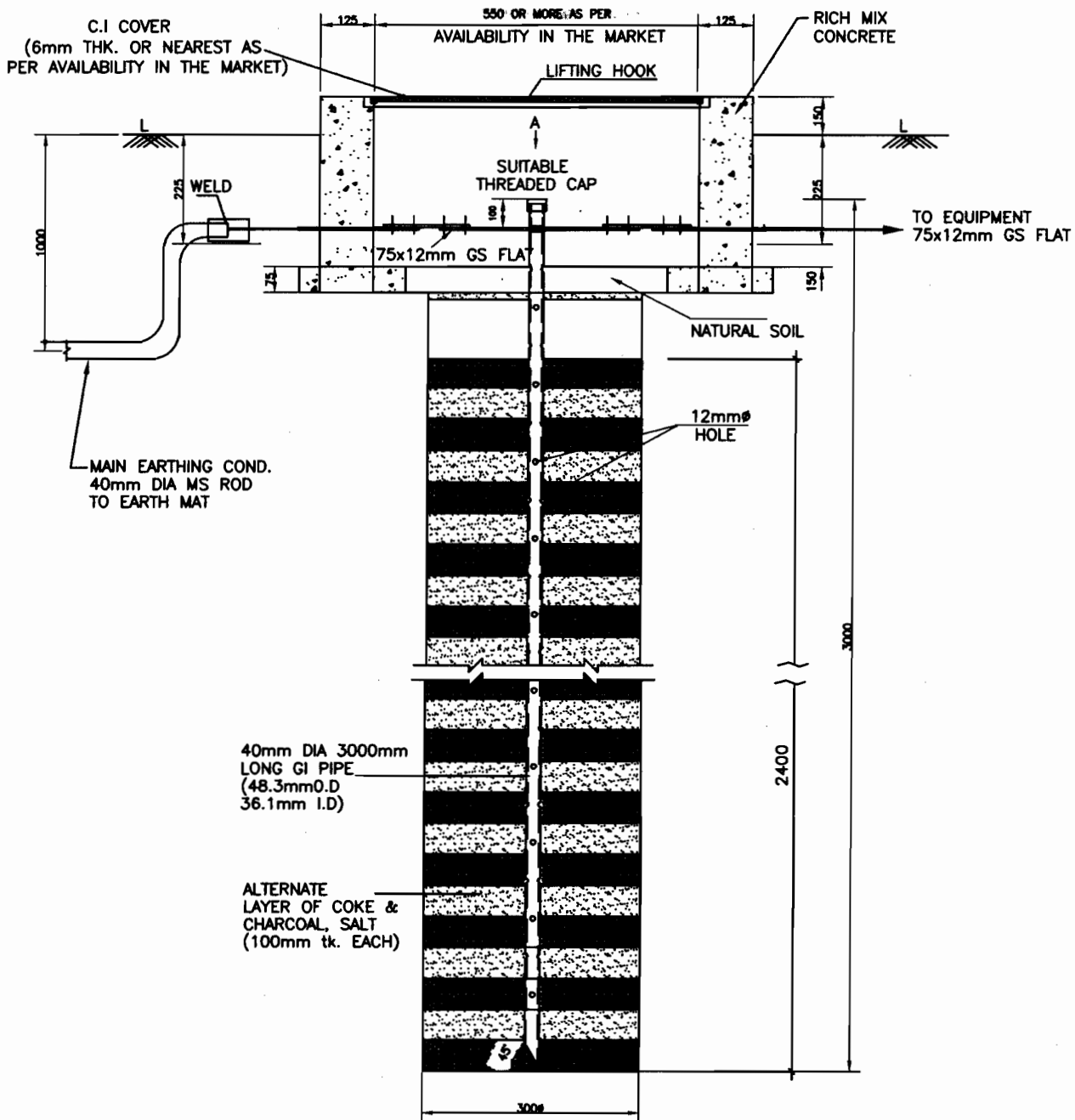
COMPU. DRG. REF.

DRG. NO.

TB-4-340-509-013

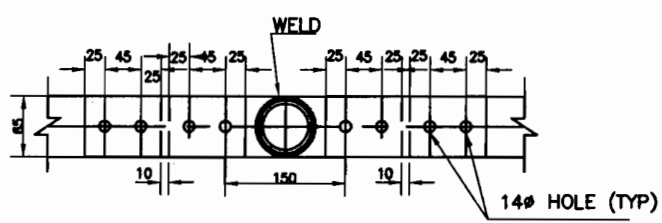
REV. 01

SHEET  
10



40mm DIA 3000mm  
LONG GI PIPE  
(48.3mm O.D  
36.1mm I.D)

ALTERNATE  
LAYER OF COKE &  
CHARCOAL, SALT  
(100mm tk. EACH)



VIEW-A

NOTE:

1. ALL NUTS,BOLTS AND WASHERS SHALL BE GALVANISED AS PER SPECIFICATION.
2. TO BE USED FOR CONNECTING TO NEUTRAL OF LT TRANSFORMER



EQUIPMENT EARTHING DETAILS  
DETAILS OF PIPE EARTH ELECTRODE  
IN TREATED EARTH PIT (ET)

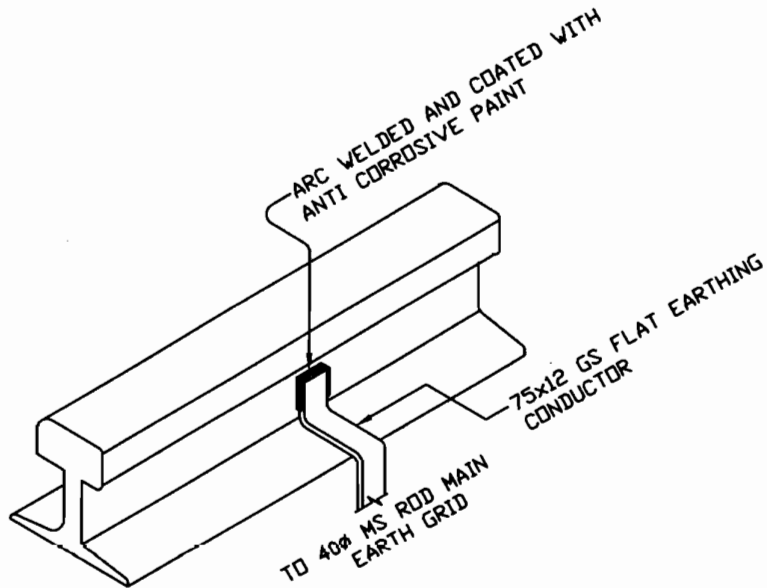
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DRG. No.

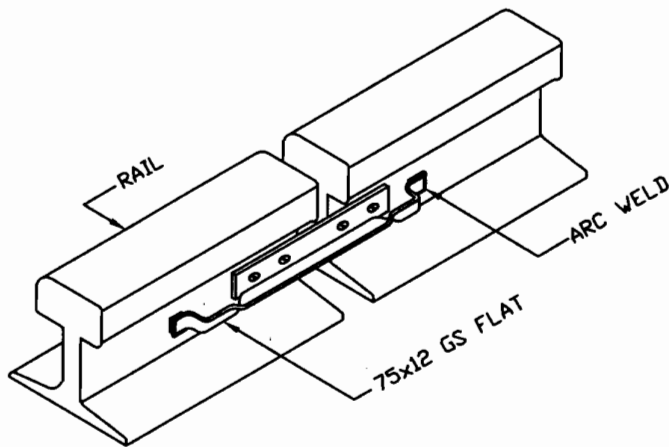
TB-4-340-509-013

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11



RAIL EARTHING



RAIL BONDING

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.

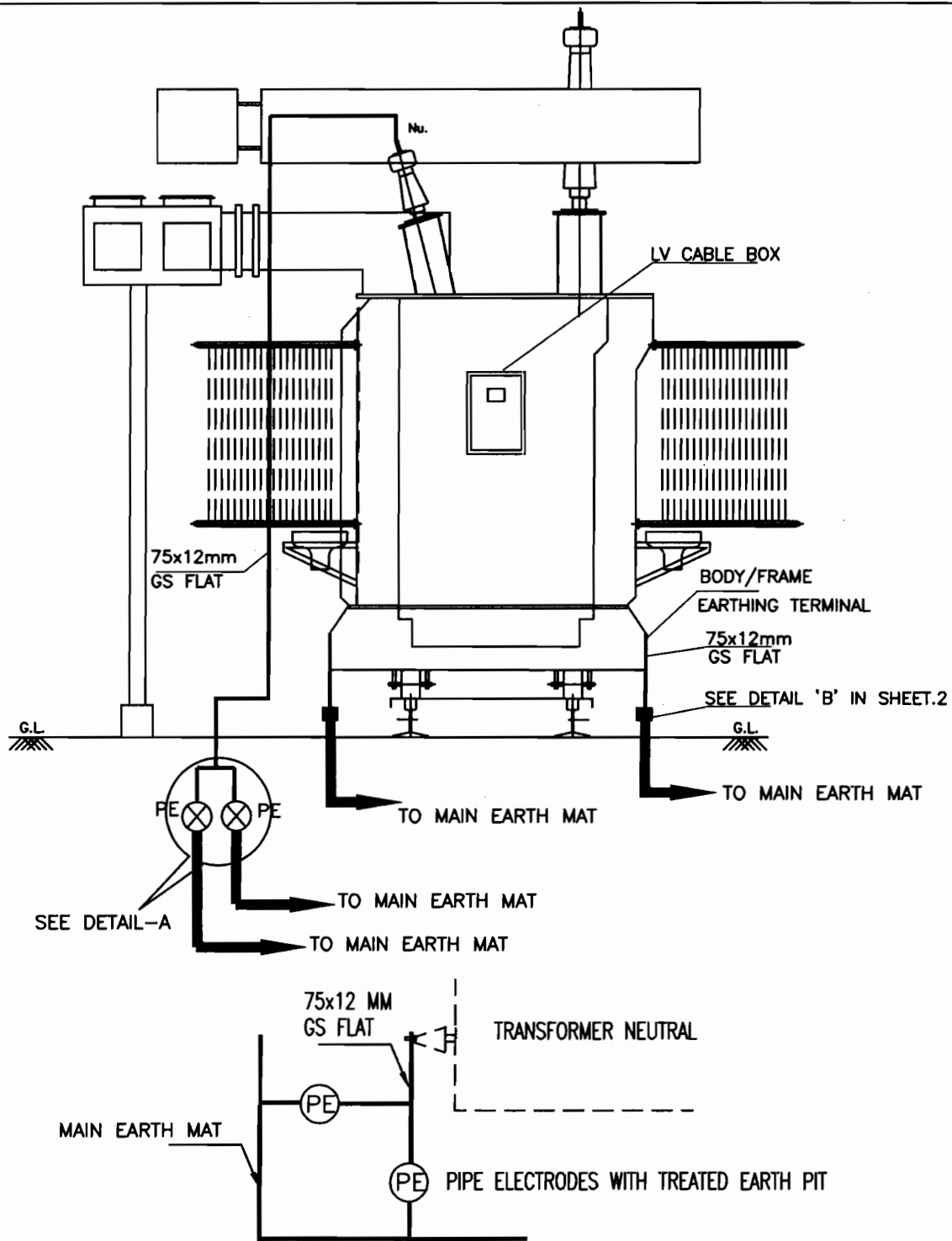
DRG. NO.

TB-4-340-509-013

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SHEET No.

12



DETAIL A

NOTE:

1. MINIMUM DISTANCE OF 6000mm SHALL BE MAINTAINED BETWEEN TWO TREATED PIPE ELECTRODE.
2. NO. OF RISERS FOR MAIN TANK = 2 NOS.
3. NO. OF RISERS FOR PIPE ELECTRODE = 2 NOS.



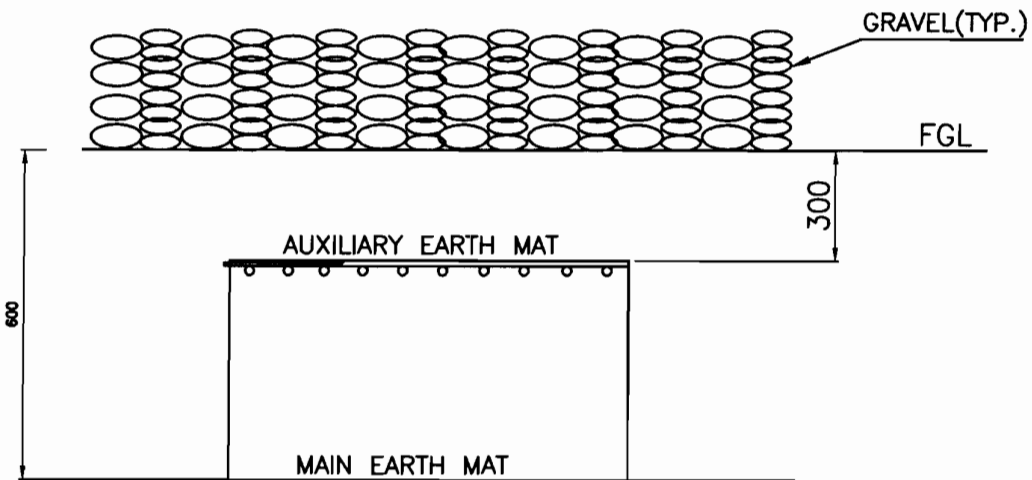
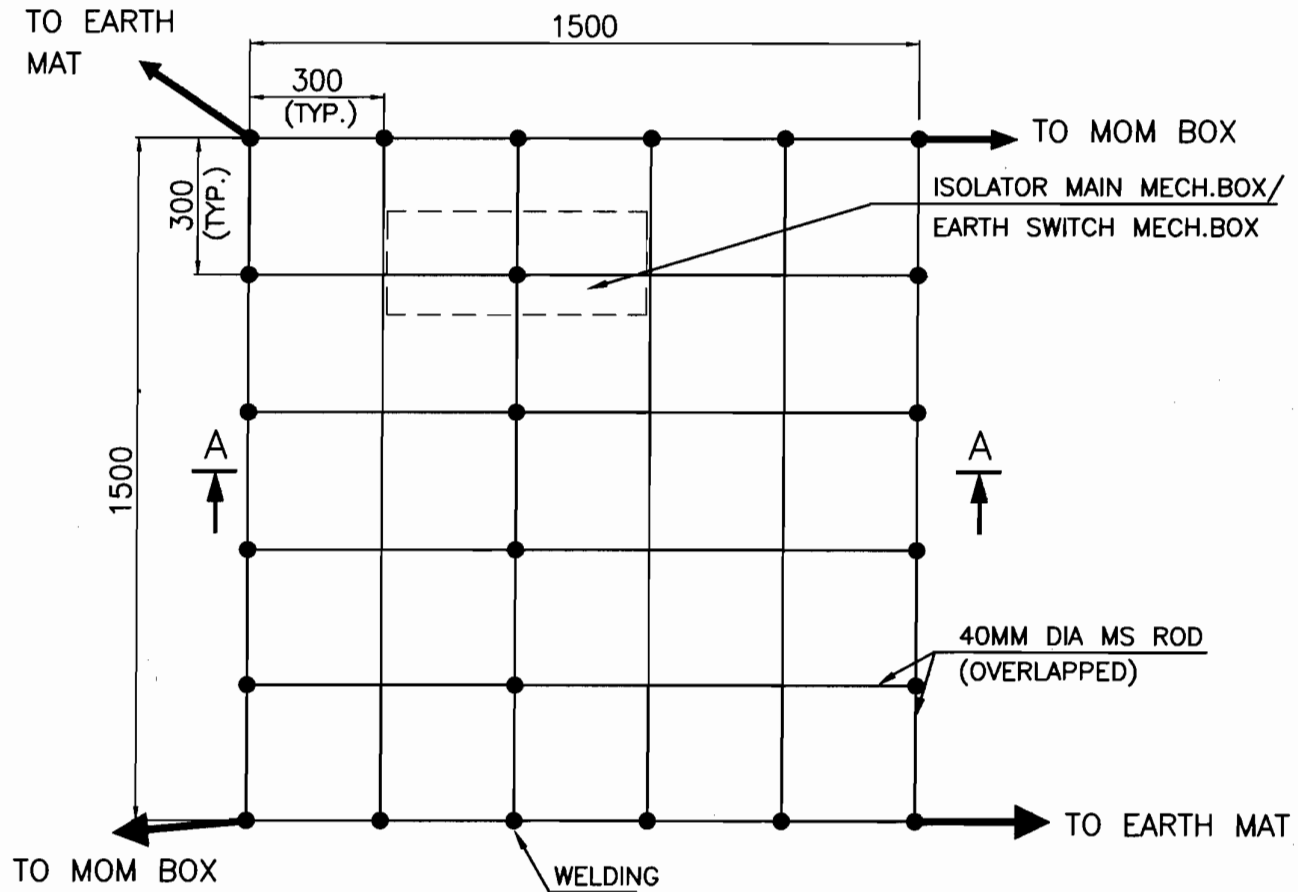
EQUIPMENT EARTHING DETAILS  
LT TRANSFORMER

DRG. No.

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SECTION AA

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 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.

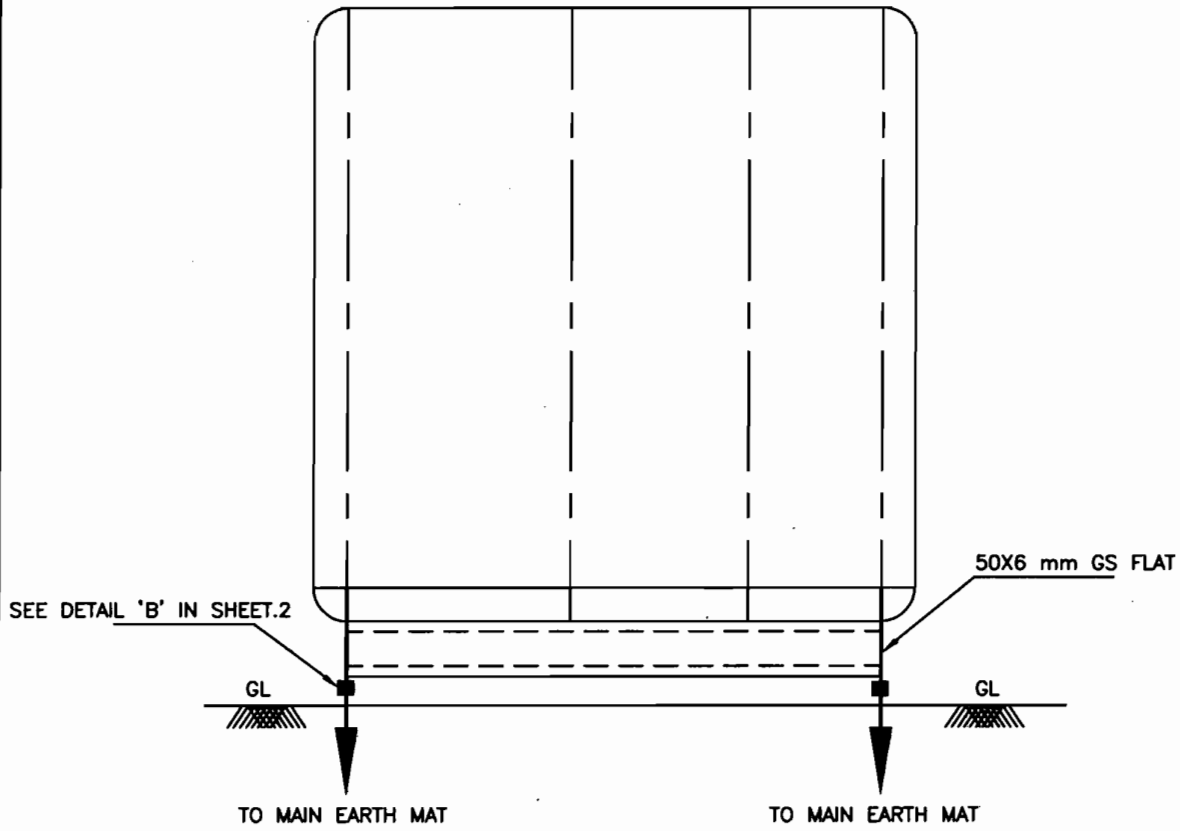
Report No.

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EQUIPMENT	FLAT SIZE
SWITCHGEAR/ MCC	50X6 mm
AC / DC DISTRIBUTION BOARDS	50X6 mm
RELAY PANELS	50X6 mm



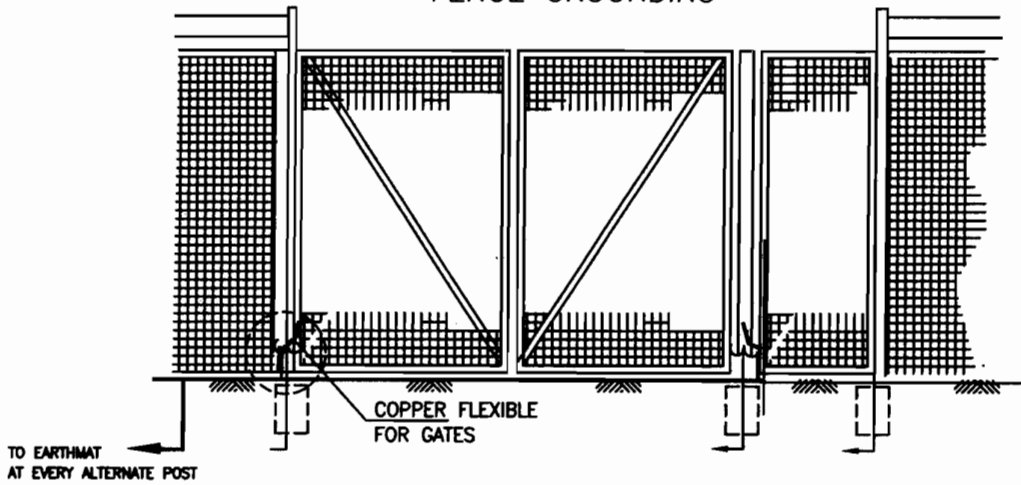
EQUIPMENT EARTHING DETAILS  
SWITCHGEAR / MCC / RELAY PANEL.

DRG. No. TB-4-340-509-013

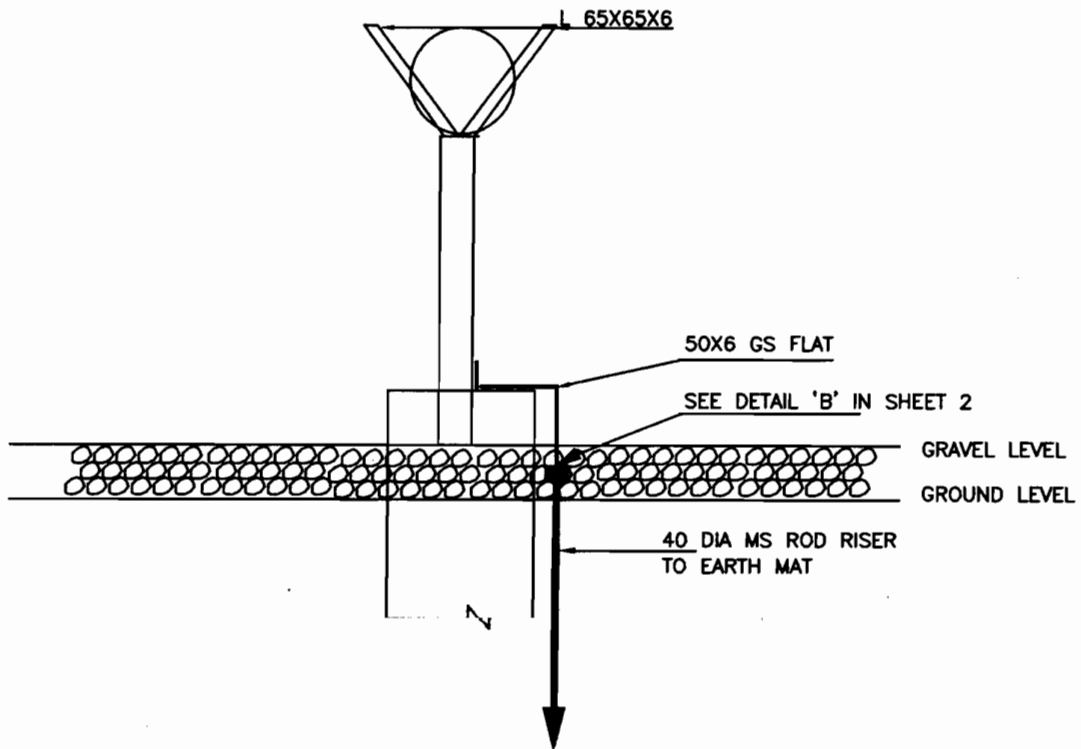
REV. 01

SHEET No. 15

### FENCE GROUNDING



EVERY ALTERNATE FENCE POSTS SHALL BE EARTHED BY 50X6 MM GS FLAT.



### FENCE EARTHING



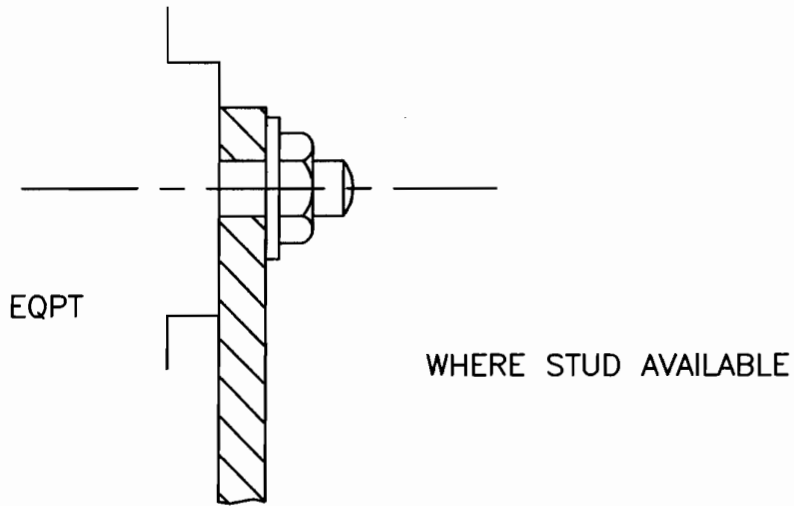
### EQUIPMENT EARTHING DETAILS FENCE POST

DRG. No.

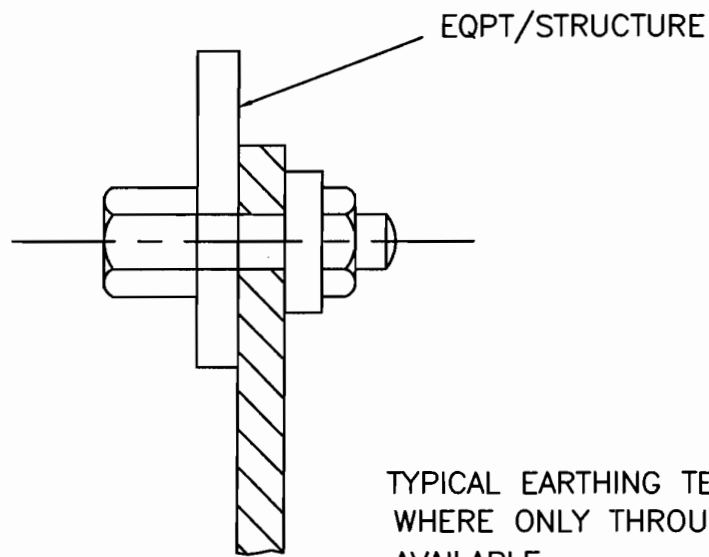
TB-4-340-509-013

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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

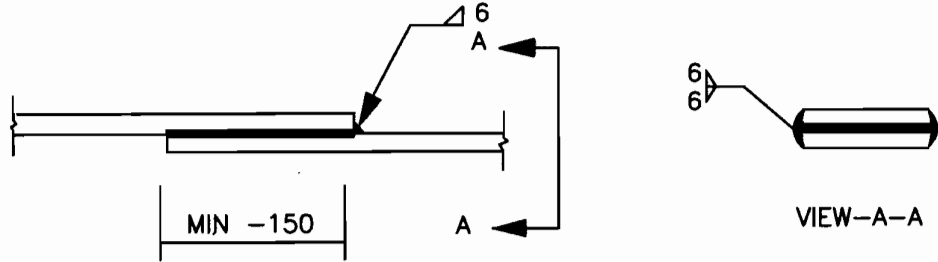
DRG. No. TB-4-340-509-013

REV. 01

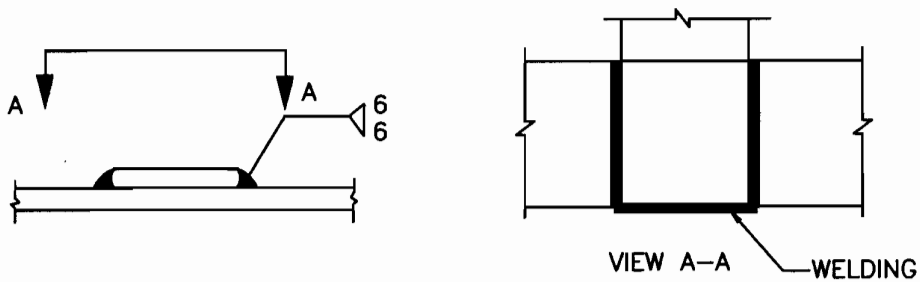
SHEET No.  
17

# STRIP TO STRIP

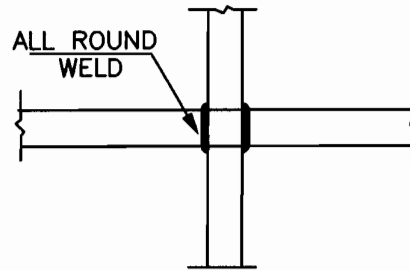
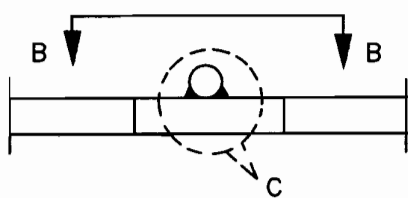
## 1. STRAIGHT LAP JOINT/RISER



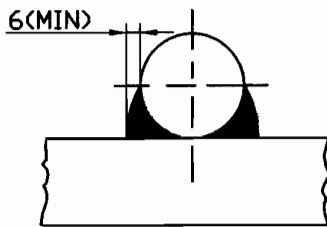
## 2. CROSS LAP JOINT



## RIGHT ANGLED JOINT (ROD TO ROD)



VIEW B-B



VIEW C



### EQUIPMENT EARTHING DETAILS WELDING DETAIL

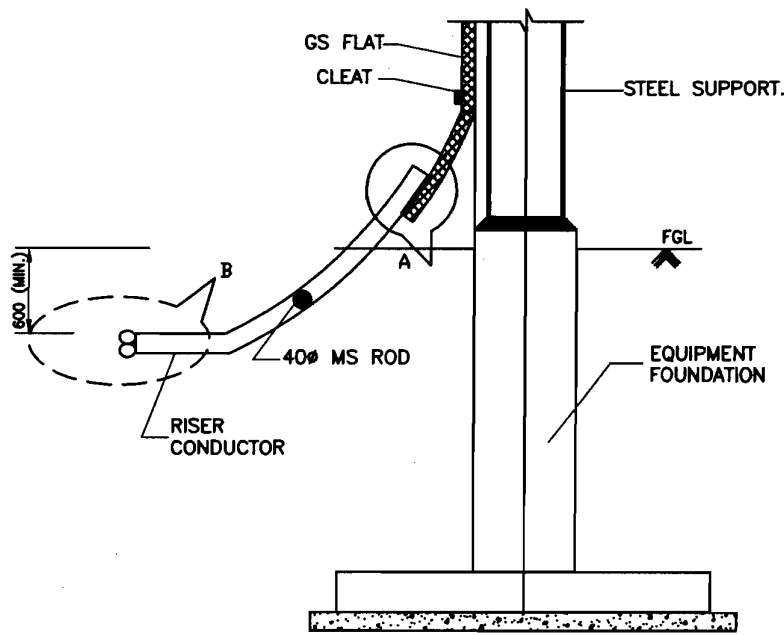
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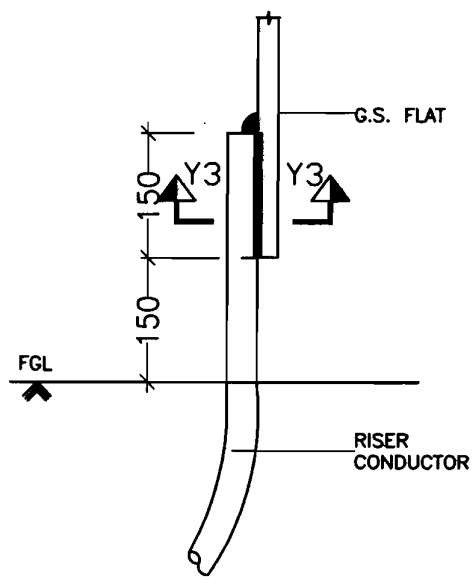
TB-4-340-509-013

REV. 01

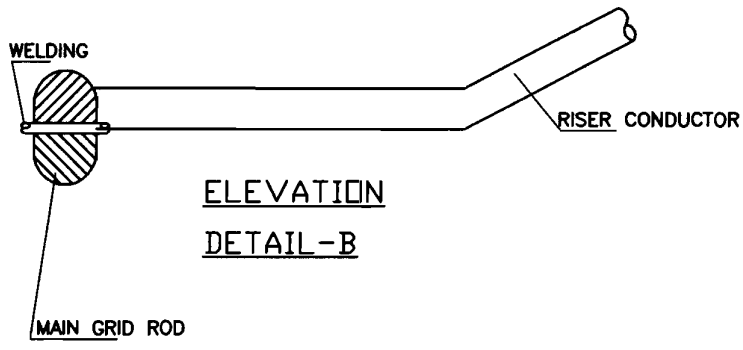
SHEET No.  
18



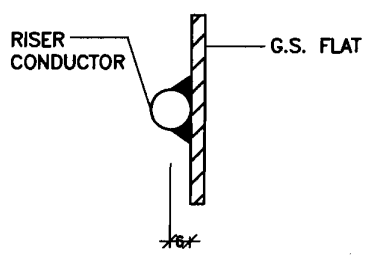
TYPICAL DETAILS OF RISER



ELEVATION  
DETAIL-A



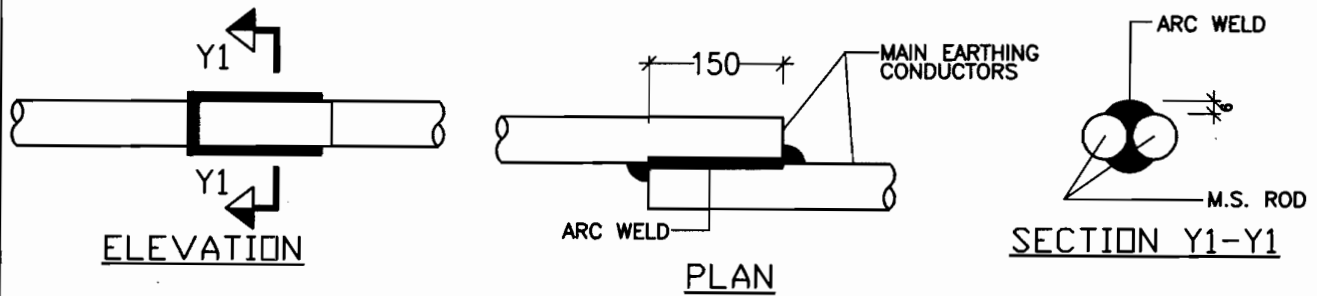
ELEVATION  
DETAIL-B



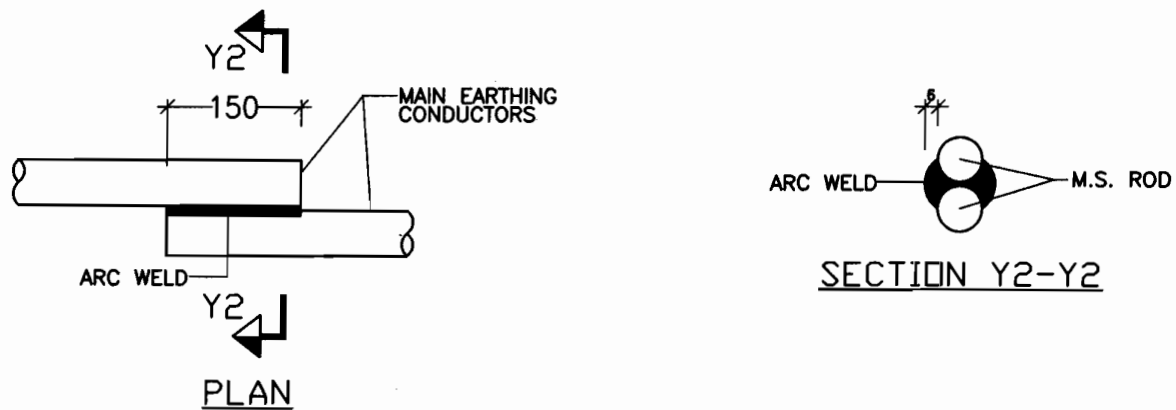
SECTION Y3-Y3



EQUIPMENT EARTHING DETAILS  
WELDING DETAILS



(CONDUCTOR IN HORIZONTAL PLANE)



(CONDUCTOR IN VERTICAL PLANE)



EQUIPMENT EARTHING DETAILS  
WELDING DETAILS

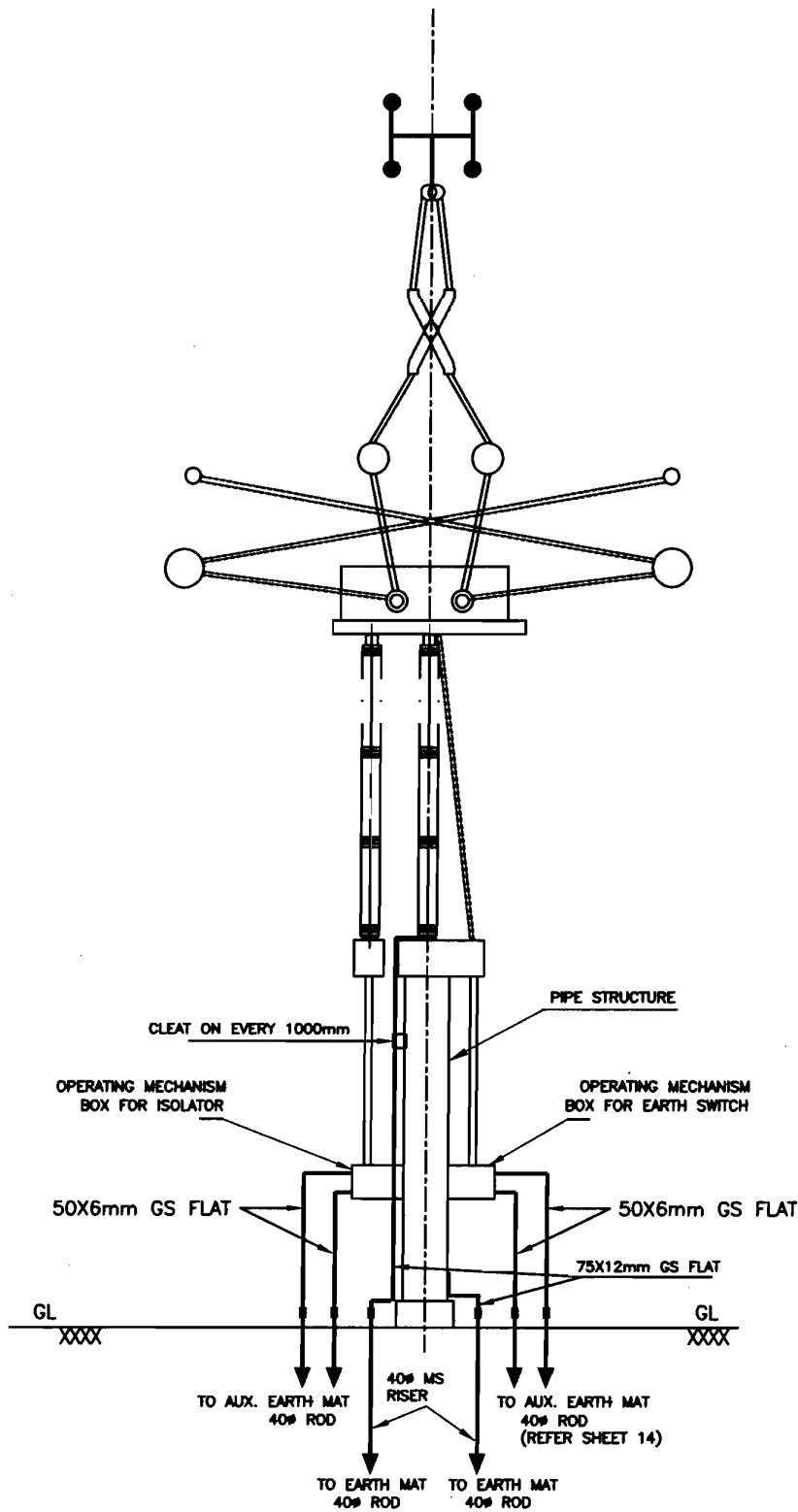
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REV. 01

SHEET No.  
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EQUIPMENT EARTHING DETAILS  
 220KV PANTOGRAPH ISOLATOR WITH ONE EARTH SWITCH

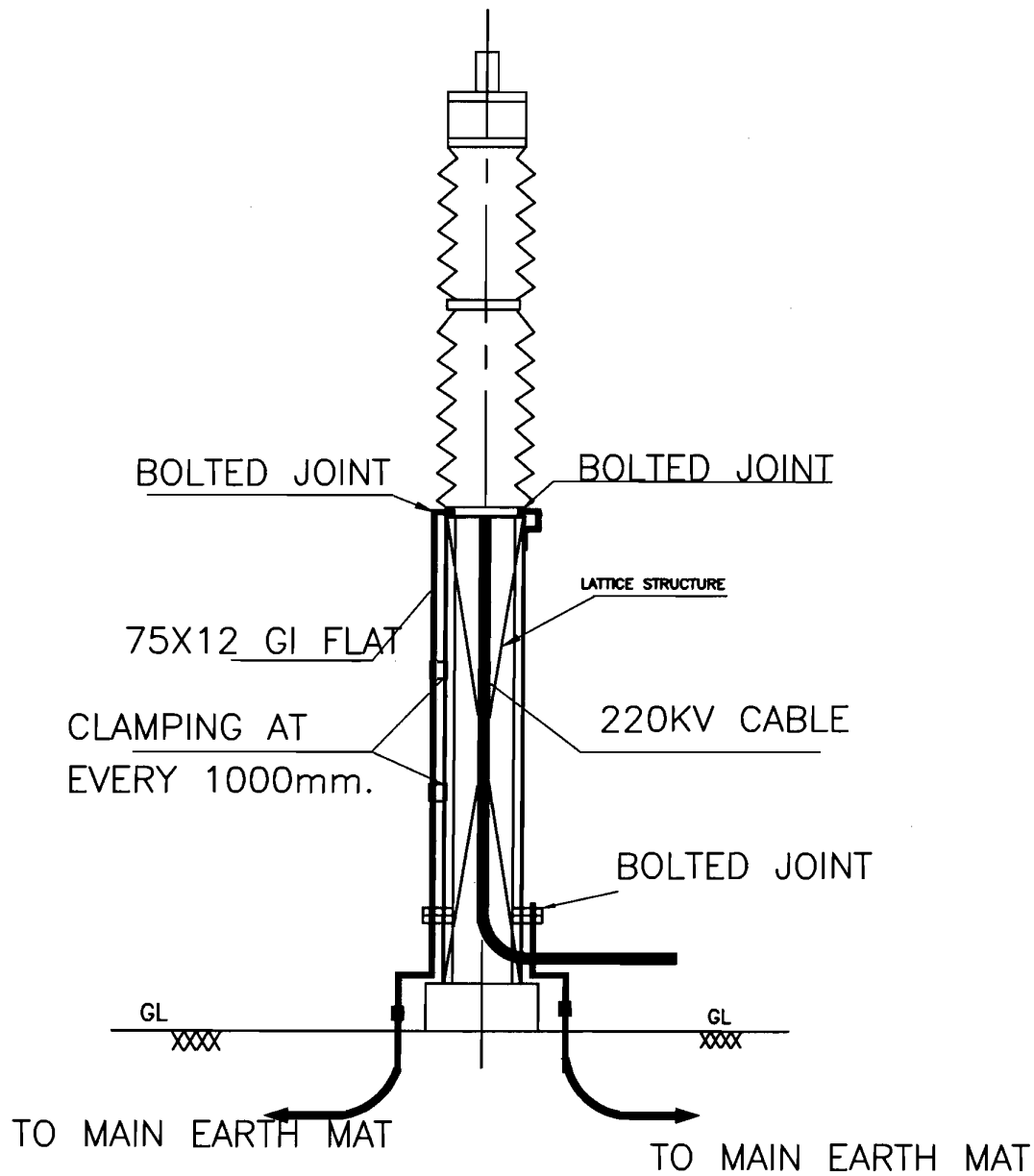
COMPUTERREF.NO.

DRG. No.

TB-4-340-509-013

REV. 01

SHEET No.  
 21



**NOTES:-**

(1) NO. OF RISERS = 2 NOS./PHASE



EQUIPMENT EARTHING DETAILS  
220KV CABLE SEALING END

COMPUTERREF.NO.

DRG. No.

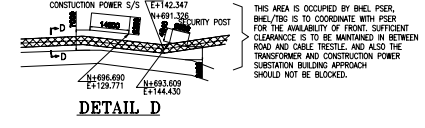
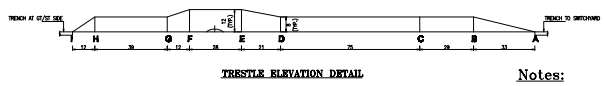
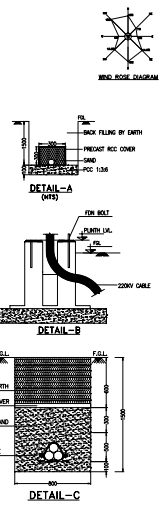
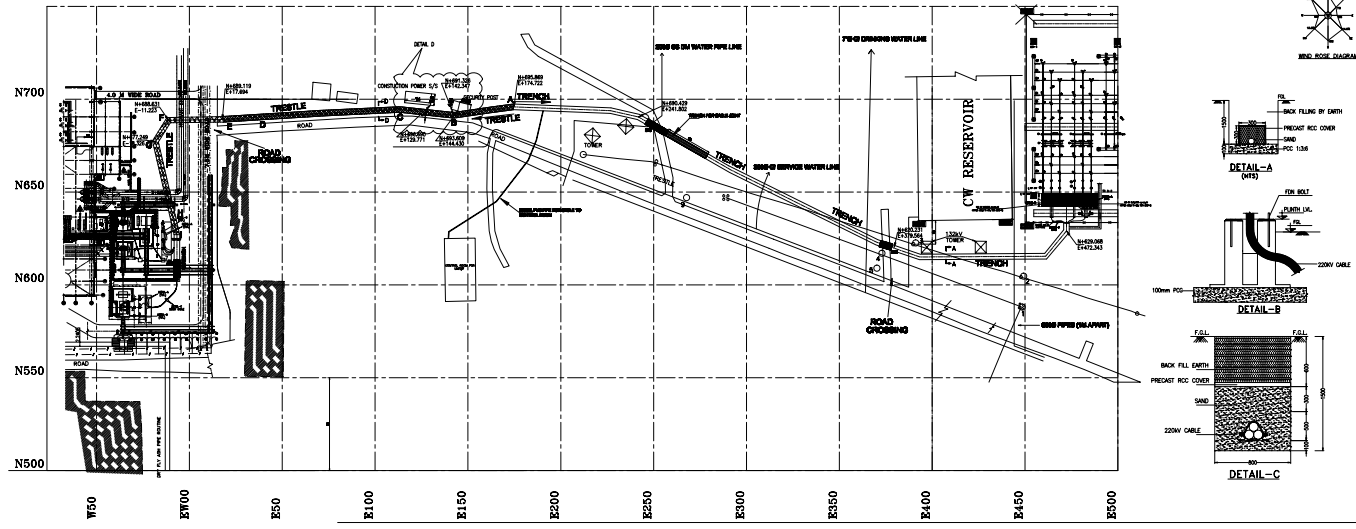
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REV. 01

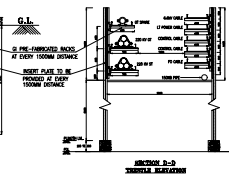
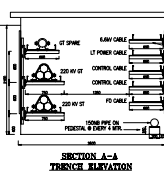
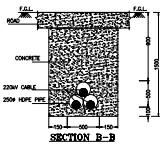
SHEET No.  
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FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

DRAWING No. TB-1-340-316-006



- Notes:**
1. THE CABLE ROUTE DRAWING SHOWN IS INDICATIVE ONLY. ROUTE MAY SLIGHTLY CHANGE AS PER SITE REQUIREMENT.
  2. TRESTLE STRUCTURE DETAILS AND FOUNDATION DETAILS SHALL BE AS PER CIVIL DRAWINGS.
  3. TRESTLE SHALL BE SO DESIGNED THAT THE MINIMUM BENDING RADIUS OF 220KV CABLES AFTER CABLE LAYING MAY BE ACHIEVED. THE MINIMUM BENDING RADIUS IS 20x $\phi$ A. OF CABLE=2500mm Approx.
  4. CABLE SHALL BE LAID IN GI LADDER TYPE TRAYS.
  5. B/C INDICATES BOX CULVERT AND GL INDICATES GROUND LEVEL.
  6. TRESTLE HEIGHT AT ROAD CROSSING SHALL BE 12m.
  6. DRAIN LEVEL SHOULD BE BELOW TRENCH BOTTOM LEVEL.
  7. WHEREVER EXISTING PIPE CROSS THE 220KV TRENCH, TRENCH WOULD SUITABLY LOWERED OR RAISED AS PER THE SITE CONDITIONS.



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 COMPUTER AIDED PAPER NAME  
 REF. DSG. No.  
 SIGN. & DATE  
 INVENTORY No.

ADDITIONAL INFORMATION R.D.No. 800111 SOURCE OF DRAWING DESIGNATION OF PRINTS		THE DURGAPUR PROJECTS LIMITED WB 220KV SWITCHYARD, 132250WV EXTN. THERMAL POWER PLANT (UNIT B)		DATE TIME SHEET NO. OF TOTAL SHEETS	
REV.	DATE	REASON FOR CHANGE	REV.	DATE	REASON FOR CHANGE
01	12.11.11	ISSUED FOR APPROVAL	01	12.11.11	ISSUED FOR APPROVAL
02	12.11.11	REVISED AS PER CIVIL COMMENT ROAD CROSSING DETAIL SHOWN.	02	12.11.11	REVISED AS PER CIVIL COMMENT ROAD CROSSING DETAIL SHOWN.

SHEET NO. 02  
 OF TOTAL SHEETS 02  
 DATE 12/11/11  
 TIME 10:50 AM