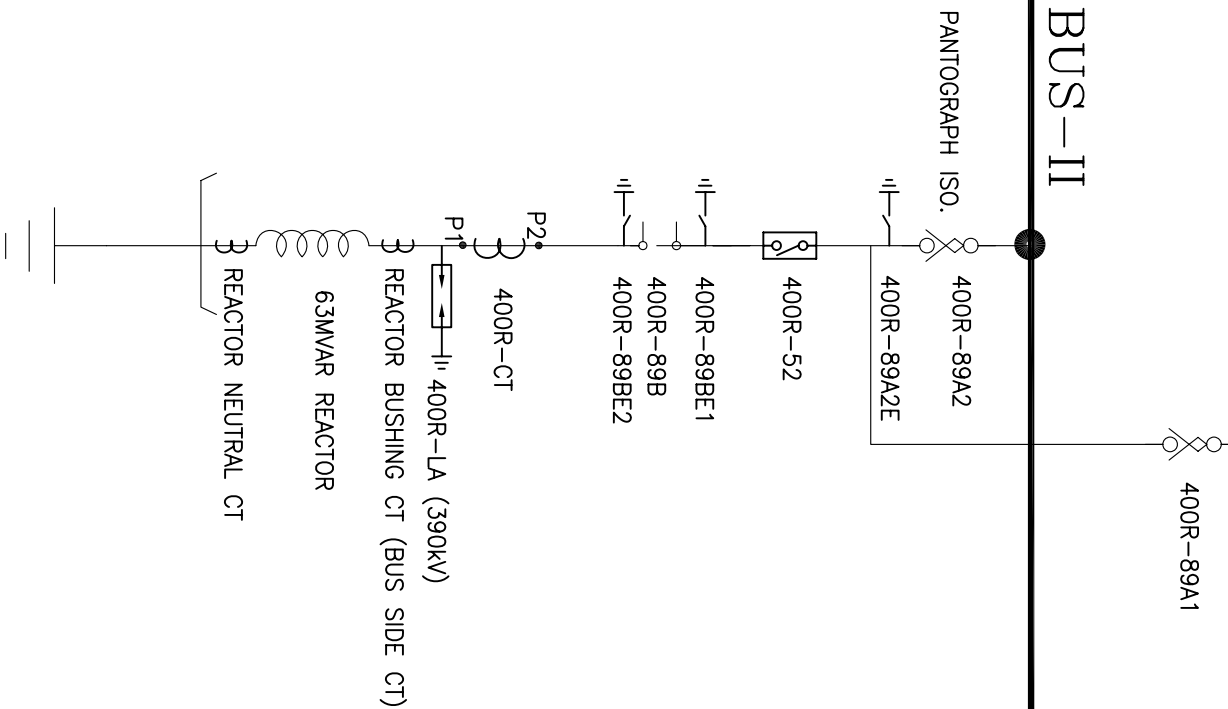









1	2	3	4	5	6	7
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DRG. NO. TB-3-342-510-001A

MAIN BUS-I

MAIN BUS-II



S.NO.	DESCRIPTION		SYMBOL ABR.	QTY.
1	400kV, 2000A, 40KA FOR 1 SEC., 3-PH. SF6 CIRCUIT BREAKER WITHOUT CLOSING RESISTOR		52	01
2	400kV, 3150A, 40KA FOR 1 SEC., 3-PH. PANTOGRAPH ISOLATOR WITH ONE EARTH SWITCH		89 89E	01
3	400kV, 3150A, 40KA FOR 1 SEC., 3-PH. PANTOGRAPH ISOLATOR WITHOUT EARTH SWITCH		89	01
4	400kV, 3150A, 40KA FOR 1 SEC., 3-PH. CENTRE BREAK ISOLATOR WITH TWO EARTH SWITCH		89B 89BE1 & 89BE2	01
5	400kV, 3000A, 40KA FOR 1 SEC., 1-PH. CURRENT TRANSFORMER		CT	03
6	390kV, 10KA Class-3 SURGE ARRESTER		LA	03
7	63MVAR, 400KV REACTOR			01

Core No.	RATIO	Output Burden at Highest Tap	Min KPV	Max Ie	Max Rct	Acc Class	Purpose
1	3000-2000 -500/1	-	3000-2000 -500 V	20 mA at KPV AT HIGHEST TAP	15-10-2.5 OHM	PS	Busbar Differential
2	3000-2000 -500/1	-	3000-2000 -500 V	20 mA at KPV AT HIGHEST TAP	15-10-2.5 OHM	PS	LBB
3	3000-2000 -500/1	20 VA	-	-	-	0.2	Metering
4	3000-2000 -500/1	-	3000-2000 -500 V	20 mA at KPV AT HIGHEST TAP	15-10-2.5 OHM	PS	Reactor Differential
5	3000-2000 -500/1	-	3000-2000 -500 V	20 mA at KPV AT HIGHEST TAP	15-10-2.5 OHM	PS	Spare

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COMPUTER DRG. PATH NAME :


SIGN & DATE

[illegible]

REV.	DATE	ALTD.	CHD.	APPD.
01	18.05.11	RK	NM/DKM	DS

DRAWING REVISED AS PER KPTCL COMMENTS DATED 11.04.11

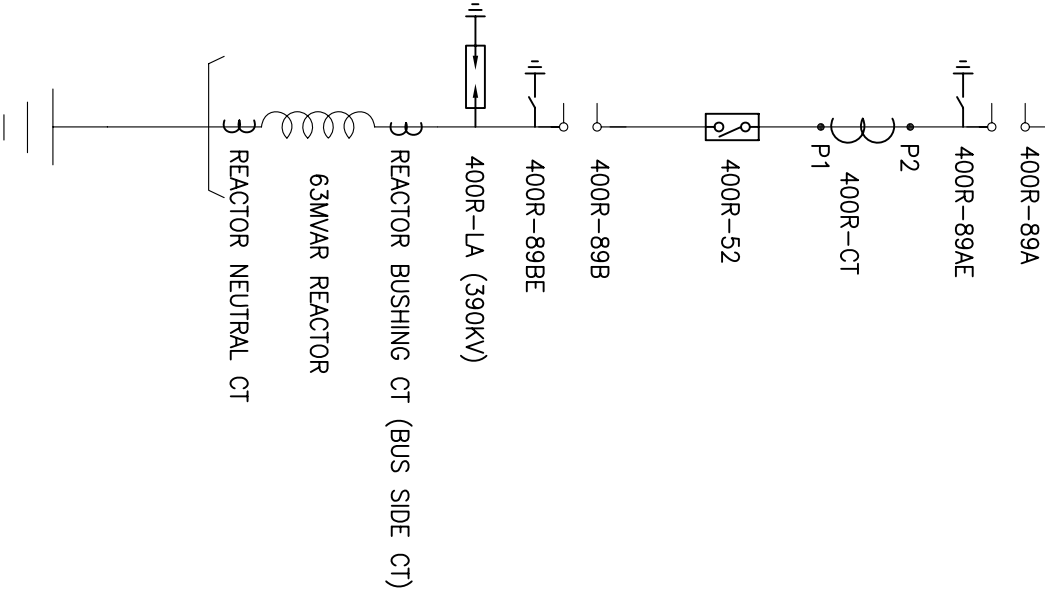
BUS REACTOR

	NAME	SIGN.	DATE	<div><div>भारत भारत</div><div></div></div> <div>BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION PROJECTS DIVISION</div> <div>SINGLE LINE DIAGRAM FOR MODIFICATION WORKS AT 400/220KV S/S GUTTUR</div> <div><div>NEXT SHEET</div><div>01</div></div> <div>CARD CODE</div>					
DRAWN	JUGENDRA	JUGENDRA	31.01.11						
CHECKED	MM/DKM								
APPROVED	DS								
DISTRIBUTION OF PRINTS									
				DEPT.	CODE				
				TBEM	422	SCALE 1:500	W.O. No. 80009	DRG. No. TB-3-342-510-001A	REV. 02

MAIN BUS-I 400KV,50HZ, 3-PH, 2000A,40KA FOR 1SEC

S.NO.	DESCRIPTION	SYMBOL	ABR.	QTY.
1	400 kV, 2000A, 40 KA FOR 1 SEC, 3-PH SF6 CIRCUIT BREAKER WITHOUT CLOSING RESISTOR		52	01
2	400KV, 3150A, 40KA FOR 1 SEC, 3-PH. CENTRE BREAK ISOLATOR WITH one EARTH SWITCH		89 89E	02
3	400KV, 2000A, 40KA FOR 1 SEC., CURRENT TRANSFORMER		CT	03
4	390KV, 10KA Class-3 SURGE ARRESTER		LA	03
5	63MVAR, 400KV REACTOR			01

SCHEDULE OF EQUIPMENT



400 kV, 2000 A CURRENT TRANSFORMER

Core No.	RATIO	Output Burden at Highest Tap	Min KPV	Max Ie	Max Rct	Acc Class	Purpose
1	2000-1000/1	-	2000-1000 V	30 mA at KPV AT HIGHEST TAP	10-5 OHM	PS	Busbar Differential
2	2000-1000/1	-	2000-1000 V	30 mA at KPV AT HIGHEST TAP	10-5 OHM	PS	LBB
3	2000-1000-500/1	20 VA	-	-	-	0.2	Metering
4	2000-1000-500/1	-	2000-1000-500 V	30 mA at KPV AT HIGHEST TAP	10-5-2.5 OHM	PS	Reactor Differential
5	2000-1000-500/1	-	2000-1000-500 V	30 mA at KPV AT HIGHEST TAP	10-5-2.5 OHM	PS	Spore

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COMPUTER DRG. PATH NAME :

SIGN & DATE

INVENTORY NO.

BUS REACTOR

REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.
02	01.08.11	MM	DKM/VK	RS	01	18.05.11	RK	MM/DKM	DS
NGR AND 120 KV LA REMOVED					DRAWING REVISED AS PER KPTCL COMMENTS DATED 11.04.11				

DEPT. TBEM

CODE 422

NAME OF CUSTOMER KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

NAME OF PROJECT (INSTALLATION OF 1X63MVAR BUS REACTOR)

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION PROJECTS DIVISION

SINGLE LINE DIAGRAM FOR MODIFICATION WORKS

AT 400/220KV S/S TALAGUPPA

SCALE 1:500

W.O. No. 80009

DRG. No. TB-3-342-510-001

CARD CODE

NEXT SHEET --

SHEET No. 01

REV. 02

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

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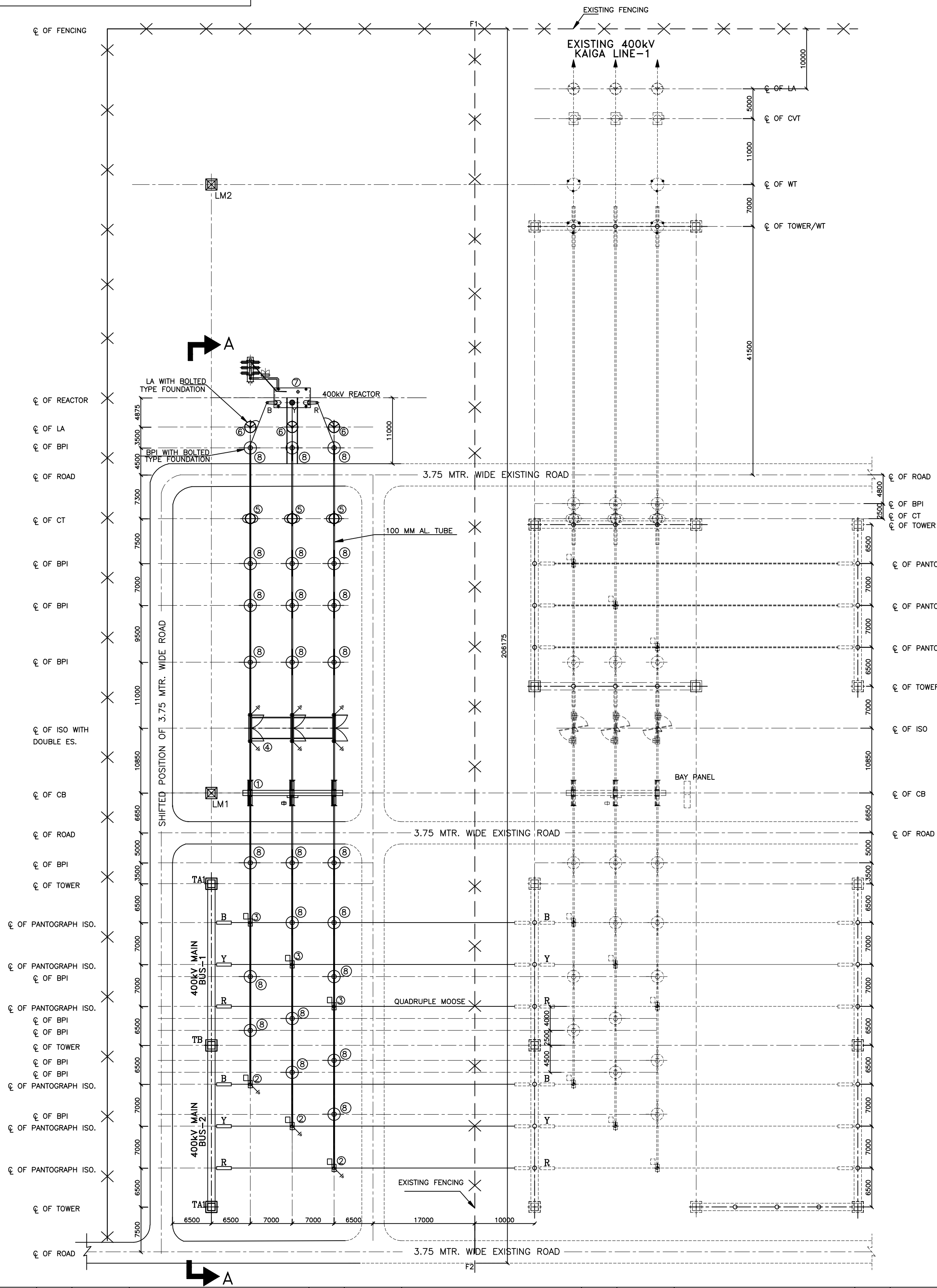
COMPUTER DRG. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.

DRAWING No. TB-2-342-316-002A



SCHEDULE OF EQUIPMENT

S.NO.	DESCRIPTION	SYMBOL	QTY.
1	400kV, 2000A, 40kA FOR 1 SEC., 3-PH. SF6 CIRCUIT BREAKER WITHOUT CLOSING RESISTOR		01
2	400kV, 3150A, 40kA FOR 1 SEC., 3-PH. PANTOGRAPH ISOLATOR WITH ONE EARTH SWITCH		01
3	400kV, 3150A, 40kA FOR 1 SEC., 3-PH. PANTOGRAPH ISOLATOR WITHOUT EARTH SWITCH		01
4	400kV, 3150A, 40kA FOR 1 SEC, 3- PH. CENTRE BREAK ISOLATOR WITH TWO EARTH SWITCH		01
5	400kV, 3000A, 40kA FOR 1 SEC., 1-PH. CURRENT TRANSFORMER		03
6	390kV, 10kA Class-3 SURGE ARRESTER		03
7	63MVAR, 400kV REACTOR		01
8	400kV POST INSULATOR		24

PARTICULARS	400KV
1. BASIC INSULATION LEVEL (KV)	1425 KV
2. MINIMUM CLEARANCE (a) B/W PHASES (FOR RIGID BUS) (b) B/W PHASES (FOR STRUNG BUS) (c) B/W PHASES TO EARTH	4000 MM 4000 MM 3500 MM
3. (a) BAY WIDTH (b) HEIGHT OF MAIN BUS	27000 MM 16000 MM
4. HEIGHT OF LIVE POINT OF VARIOUS EQUIPMENTS ISOLATOR, CT, BREAKER ETC. FROM PLINTH	8000 MM
5. POWER FREQUENCY WITH STAND VOLTAGE	630 KV
6. CREPAGE DISTANCE	10500 MM
7. SECTIONAL CLEARANCE	6500 MM

CONDUCTOR-ALUMINIUM TUBE-100MM

1. NOMINAL SIZE	100 MM
2. OUTER DIAMETER	114.2 MM
3. INNER DIAMETER	97.18 MM
4. WALL THICKNESS	8.51 MM
5. CROSS SECTION	2825.61SQMM
6. MAX. DC RESIST AT 20° C	-
7. CURRENT RATING AT OUTDOOR	3150A
8. WEIGHT PER UNIT LENGTH	7.7 KG/M
9. GRADE OF ALUMINIUM.	63401 WP (RANGE 2) AS PER IS 5082

CONDUCTOR - MOOSE

1. STANDING AND WIRE DIAMETER	54/3.53(AL) +7/3.53(STEEL)
2. SECTIONAL AREA OF ALUMINIUM	528.5 SQ.MM.
3. TOTAL SECTIONAL AREA	597.00 SQ.MM.
4. OVERALL DIA	31.77 MM.
5. WEIGHT (APPROX.)	2004 KG/M
6. DC RESISTANCE AT 20° C	0.05552 OHM/KM
7. MINIMUM U.T.S.	161.2 KN

BEAMS

S.NO.	BEAM DESIGNATION	BEAM WIDTH	QTY.
1	BM1	27000 MM	02

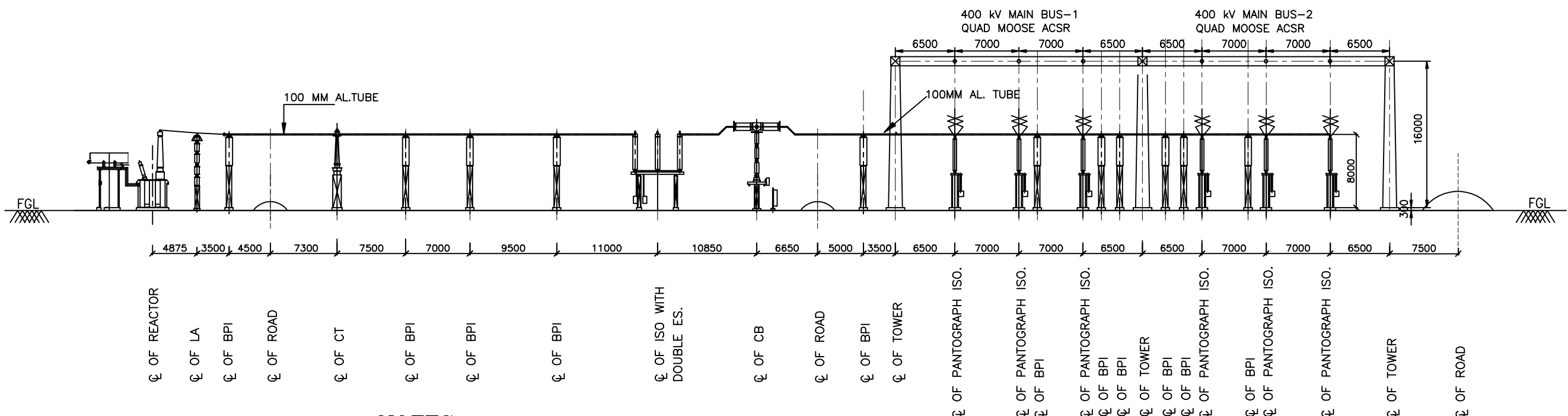
BUS POST INSULATOR	TOP PCD	BOTTOM PCD	QTY.
400kV	127 MM	300 MM	24

EQUIPMENTS STRUCTURE QUANTITY

1. 400kV CT STRUCTURE (1Ph)	03
2. LA STRUCTURE-390kV (1Ph)	03
3. ISOLATOR STRUCTURE (3Ph)	03
4. BPI STRUCTURE	24

TOWERS

S.NO.	TOWER DESIGNATION	STR. HEIGHT	QTY.
1	TA1	16000 MM	02
2	TB	16000 MM	01
3	LM	49500 MM	02



NOTES: -

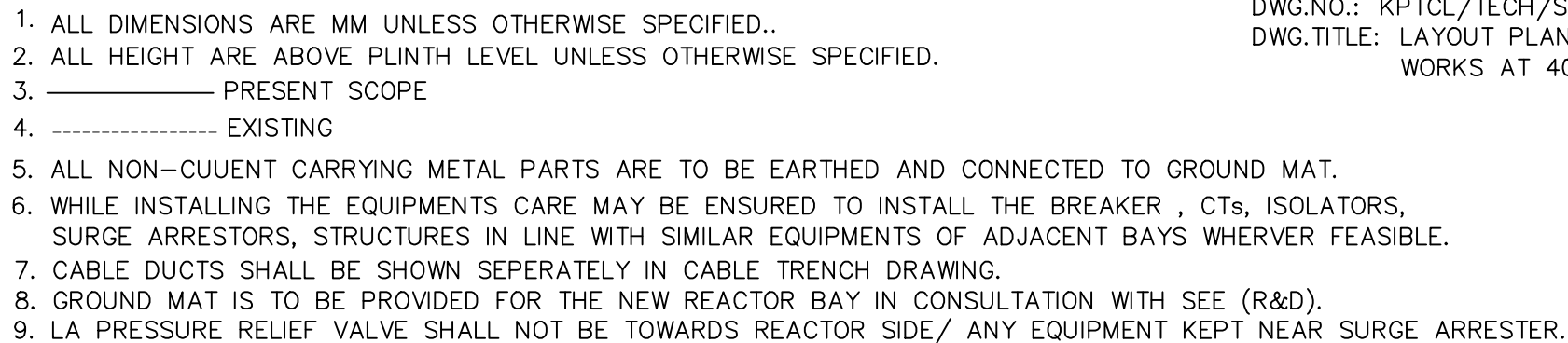
1. ALL DIMENSIONS ARE MM UNLESS OTHERWISE SPECIFIED..
2. ALL HEIGHT ARE ABOVE PLINTH LEVEL UNLESS OTHERWISE SPECIFIED.
3. _____ PRESENT SCOPE
4. _____ EXISTING
5. ALL NON-CURRENT CARRYING METAL PARTS ARE TO BE EARTHED AND CONNECTED TO GROUND MAT.
6. WHILE INSTALLING THE EQUIPMENTS CARE MAY BE ENSURED TO INSTALL THE BREAKER , CTs, ISOLATORS, SURGE ARRESTORS, STRUCTURES IN LINE WITH SIMILAR EQUIPMENTS OF ADJACENT BAYS WHEREVER FEASIBLE.
7. CABLE DUCTS SHALL BE SHOWN SEPERATELY IN CABLE TRENCH DRAWING.
8. GROUND MAT IS TO BE PROVIDED FOR THE NEW REACTOR BAY IN CONSULTATION WITH SEE (R&D).
9. LA COMING BETWEEN RAIL TRACK AND REACTOR MUST HAVE REMOVABLE TYPE STEEL STRUCTURE SO THAT THESE CAN BE REMOVED WHEN REACTOR HAS TO BE TAKEN OUT FOR REPAIR/ REPLACEMENT.
10. LA PRESSURE RELIEF VALVE SHALL NOT BE TOWARDS REACTOR SIDE/ ANY EQUIPMENT KEPT NEAR SURGE ARRESTER.
11. FENCE SECTION F1-F2 SHALL BE DISMANTLED







REFERENCE DWG.

DWG.NO. KPTCL/TECH/SS-400/GTR-1(R1)
DWG.TITLE: DETAILED LAYOUT PLAN FOR PROVIDING
BUS REACTOR AT 400/220/33 KV GUTTUR STATION

ADDITIONAL INFORMATION W.O.No. 80009	आहक/परियोजना का नाम KARNATAKA POWER TRANSMISSION CORPORATION LIMITED (INSTALLATION OF 1X63MVAR BUS REACTOR)
STATUS OF DRAWING	NAME OF CUSTOMER/PROJECT
DISTRIBUTION OF PRINTS	भारत हेवी इलेक्ट्रिकल्स लिमिटेड ट्रांसमिशन परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
REV. 01 DATE 23.06.11 ALTERED CHECKED APPROVED RK MM DKM	विभाग DEPT. कोड CODE शीर्षक/TITLE LAYOUT PLAN & SECTION FOR MODIFICATION WORKS AT 400/220KV S/S GUTTUR
REV. 02 DATE 29.09.11 ALTERED CHECKED APPROVED RK MM DKM	अनुपात / SCALE कार्ड कोड CARD CODE
REV. 03 DATE 29.09.11 ALTERED CHECKED APPROVED RK MM DKM	पुनः/REV. 02
REV. 04 DATE 29.09.11 ALTERED CHECKED APPROVED RK MM DKM	पृष्ठ क्र./SHEET No. 01 अगला पृष्ठ/NEXT SHEET --

DRAWING No. TB-2-342-316-002



S.NO	DESCRIPTION	SYMBOL	QTY.
1	400 kV, 2000A, 40 KA FOR 1 SEC, 3-PH SF6 CIRCUIT BREAKER WITHOUT CLOSING RESISTOR		01
2	400kV, 3150A, 40KA FOR 1 SEC, 3-PH. CENTRE BREAK ISOLATOR WITH ONE EARTH SWITCH		02
3	400kV, 2000/1-1A & 500/1-1-1A, 40KA FOR 1 SEC CURRENT TRANSFORMER		03
4	390kV, 10kA Class-3 SURGE ARRESTER		03
5	63MVAR, 400KV REACTOR		01
6	400 kV POST INSULATORS		06

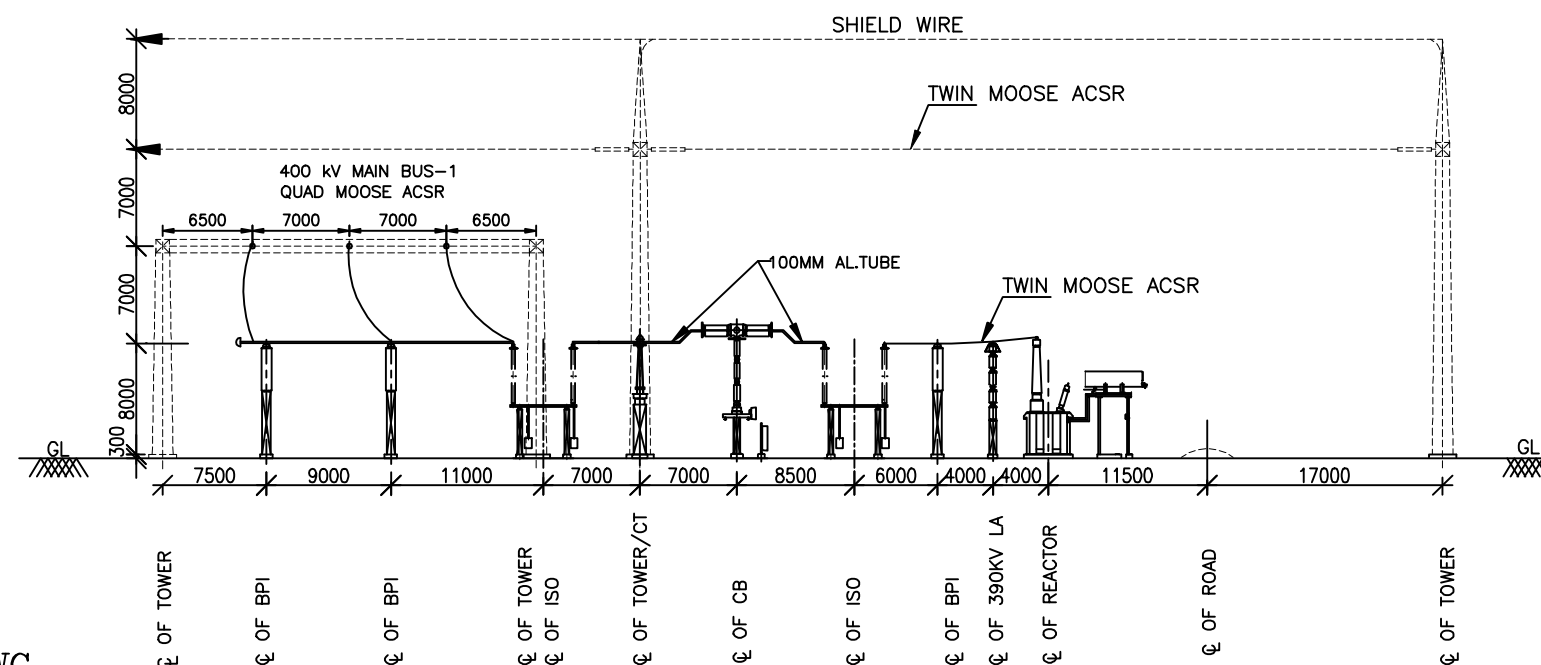
CONDUCTOR-ALUMINIUM TUBE-100MM		
1.	NOMINAL SIZE	100 MM
2.	OUTER DIAMETER	114.2 MM
3.	INNER DIAMETER	97.18 MM
4.	WALL THICKNESS	8.51 MM
5.	CROSS SECTION	2825.61SQMM
6.	MAX. DC RESIST AT 20° C	—
7.	CURRENT RATING AT OUTDOOR	3150
8.	WEIGHT PER UNIT LENGTH	7.7 KG/M
9.	GRADE OF ALUMINIUM.	63401 WP (RANGE 2) AS PER IS 5082

CONDUCTOR – MOOSE		
1.	STANDING AND WIRE DIAMETER	54/3.53(AL) +7/3.53(STEEL)
2.	SECTIONAL AREA OF ALUMINIUM	528.5 SQ.MM.
3.	TOTAL SECTIONAL AREA	597.00 SQ.MM.
4.	OVERALL DIA	31.77 MM.
5.	WEIGHT (APPROX.)	2004 KG/M
6.	DC RESISTANCE AT 20 °C	0.05552 OHM/KM
7.	MINIMUM U.T.S.	161.2 KN

PARTICULARS		400KV
1.	BASIC INSULATION LEVEL (KV)	1425 KV
2.	MINIMUM CLEARANCE	
	(a) B/W PHASES (FOR RIGID BUS)	4000 MM
	(b) B/W PHASES (FOR STRUNG BUS)	4000 MM
	(c) B/W PHASES TO EARTH	3500 MM
3.	(a) BAY WIDTH	27000 MM
	(b) HEIGHT OF MAIN BUS	15000 MM
	(C) HEIGHT OF JACK BUS	22000 MM
4.	HEIGHT OF LIVE POINT OF VARIOUS EQUIPMENTS ISOLATOR, CT, BREAKER ETC.	8000 MM
5.	POWER FREQUENCY WITH STAND VOLTAGE	630 KV
6.	CREPAGE DISTANCE	10500 MM
7.	SECTIONAL CLEARANCE	6500 MM

EQUIPMENTS STRUCTURE QUANTITY		
1.	400kV CT STRUCTURE (1Ph)	03
2.	LA STRUCTURE-390kV (1Ph)	03
3.	ISOLATOR STRUCTURE (3Ph)	02
4.	BPI STRUCTURE	06



<u>BUS POST INSULATOR</u>	<u>TOP PCD</u>	<u>BOTTOM PCD</u>	<u>QTY.</u>
400kV	127 MM	300 MM	06



SECTION A-A

REFERENCE DWG.

DWG.NO.: KPTCL/TECH/SS-400/TLE-1
DWG.TITLE: LAYOUT PLAN FOR MODIFICATION
WORKS AT 400/220 KV S/S TALAGUPPA

ADDITIONAL INFORMATION W.O.No. 80009				ग्राहक/परियोजना का नाम KARNATAKA POWER TRANSMISSION CORPORATION LIMITED (INSTALLATION OF 1X63MVAR BUS REACTOR)			
STATUS OF DRAWING							
DISTRIBUTION OF PRINTS				 भारत हेवी इलेक्ट्रिकल्स लिमिटेड ट्रांसमिशन परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION			
REV.	DATE	ALTERED	RK	विभाग	 अनुपात / SCALE	कार्ड कोड CARD CODE	
01	10.06.11	CHECKED	MM	DEPT.			
		APPROVED	DKM	कोड CODE			
ZONE	DWG. REVISED AS PER CUSTOMER COMMENTS DATED 21.05.11			शीर्षक/TITLE LAYOUT PLAN & SECTION FOR MODIFICATION WORKS AT 400/220KV S/S TALAGUPPA		डाईंग. क्र./DRAWING NO. TB-2-342-316-002	
						पृष्ठ क्र./SHEET No. 01	उगला पृष्ठ/NEXT SHEET -
						ड्रॉइंग DRAWN JUGENDRA	हस्ता./SIGN. JUGENDRA
						चेक CHECKED MM/DKM	दि./DATE 31.01.11
						स्वीकृत APPROVED DS	25.03.11
						-SD-	25.03.11

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COMPUTER DRG. PATH NAME :

REF. DRG. NO.

SIGN & DATE

INVENTORY NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED			CHECKED
		APPD			APPD			APPD
						JOB No.		

LEGEND

- CONNECTION TO GROUND MAT THROUGH RISER.
—⊗ PE CONNECTION TO PIPE ELECTRODE.
● RISER

GENERAL NOTES:

- EARTH STRIP SHALL BE CLEATED TO LATTICE /PIPE TYPE STRUCTURE AT AN INTERVAL OF 1.0M.
- FOR WELDING DETAILS REFER SHEET #19, 20 & 21.
- E/WIRE DOWN CONDUCTOR SHALL BE CLEATED AT AN INTERVAL OF 2.0 M ALONG THE STRUCTURE. NO HOLES IN STRUCTURE ARE ALLOWED FOR THIS PURPOSE.
- NOT MORE THAN 2 RISERS ARE PERMISSIBLE PER PIG TAIL (40mm DIA. ROD.).
- SUBSTRUCTURE/STOOL SHALL NOT BE USED FOR EARTHING PURPOSE
- EARTHING LEAD FROM ON EQUIPMENT /STRUCTURE SHALL BE CONNECTED TO DIFFERENT EARTHING GRID.
- EQUIPMENT SHOWN IN DRAWING IS ONLY SYMBOLIC REPRESENTATION.

SHEET NO. DESCRIPTION

02. 400kV SF6 CIRCUIT BREAKER
03. 400kV POST INSULATOR (SOLID CORE TYPE)
04. 390kV LIGHTNING ARRESTER
05. MARSHALLING KIOSK
06. 400/220kV HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH
6A. 400kV HORIZONTAL CENTER BREAK ISOLATOR WITH ONE EARTH SWITCH
6B. 400kV HORIZONTAL CENTER BREAK ISOLATOR WITH TWO EARTH SWITCH
6C. 400kV PANTOGRAPH ISOLATOR WITHOUT EARTH SWITCH
6D. 400kV PANTOGRAPH ISOLATOR WITH ONE EARTH SWITCH
07 SHIELD WIRE TOWER
07A. LIGHTNING MAST
07B. ROD ELECTRODE WITH TEST LINK FOR LM, TOWER WITH PEAK AND LA
08. 400/220/66kV CURRENT TRANSFORMER
09. CABLE TRENCH
10. DETAIL OF PIPE EARTH ELECTRODE IN TREATED EARTH PIT (ET)

SHEET NO. DESCRIPTION

11. RAIL BONDING
12. AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S MECH. BOX.
13. SWITCHGEAR / MCC / CONTROL AND RELAY BOARD/AC KIOSK
14. 400kV SHUNT REACTOR.
15. FENCE POST
16. TYPICAL ARRANGEMENT OF EQUIPMENT EARTHING WITH MAIN GRID
17. WELDING DETAILS
17A. WELDING DETAILS
17B. WELDING DETAILS

FOR TENDER PURPOSE ONLY

W.O.NO. 80008/80009

STATUS

CUSTOMER KARNATAKAPOWER TRANSMISSION CORPORATION LTD.

PROJECTS 400/220 KV NELAMANGLA & HOODY S/S
400/220 KV TALAGUPPA & GUTTUR S/S



भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रान्समिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

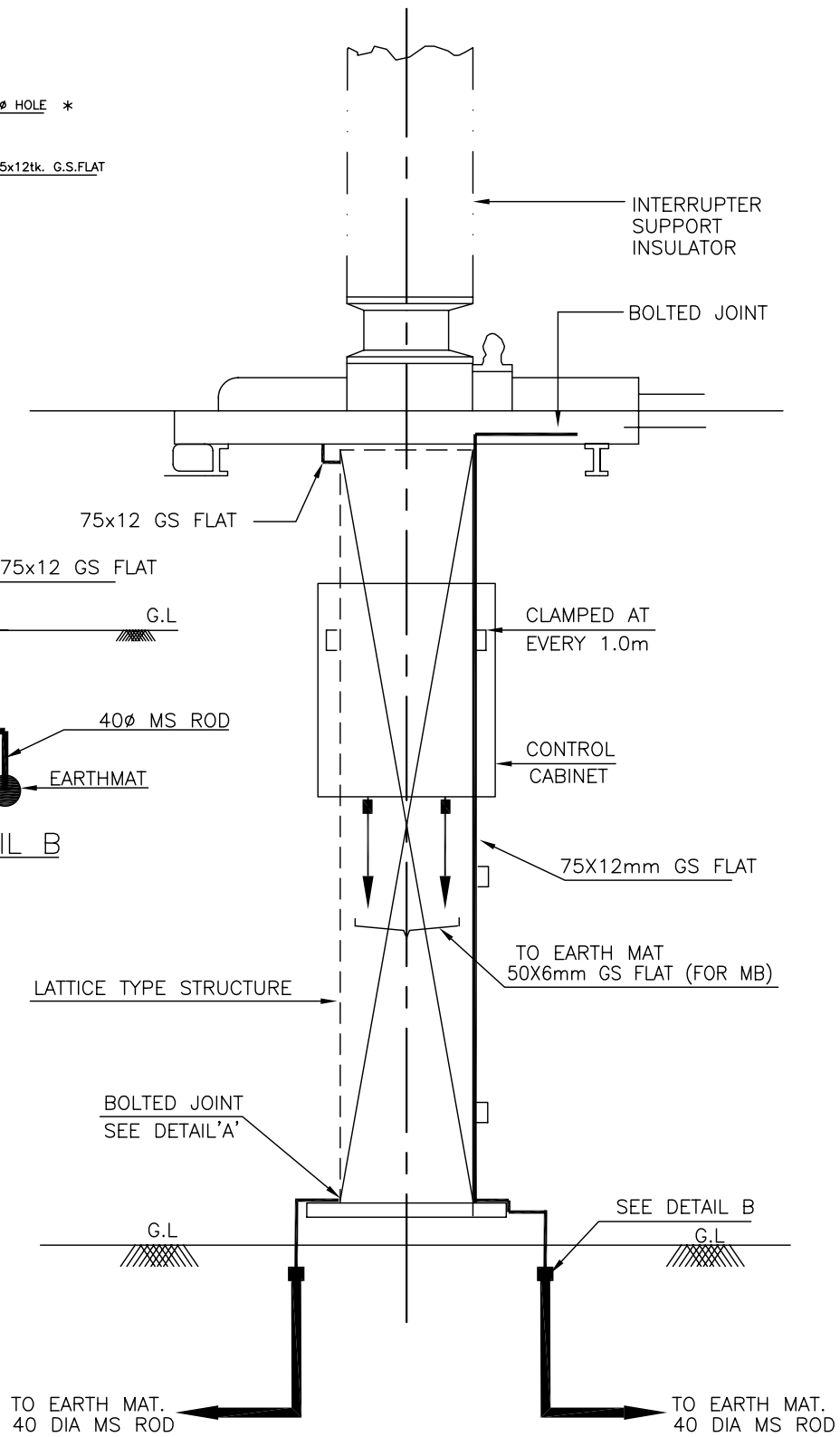
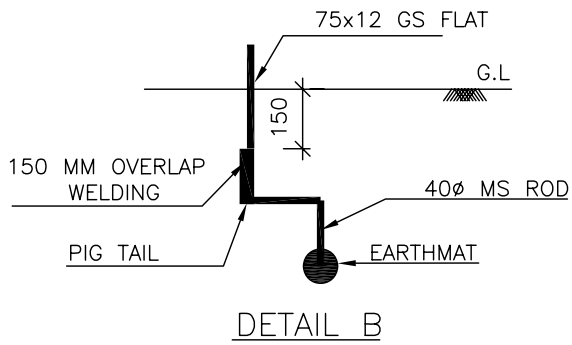
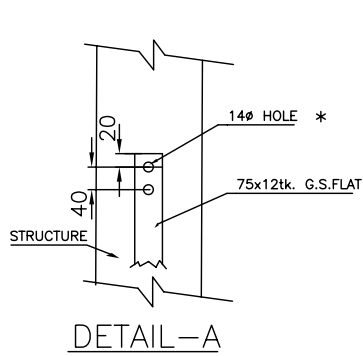
DEPT CODE	NAME	SIGN.	DATE
DRN			
DESN			
CHD			
APPD			

REV.	DATE	ALTD	CHD	APPD
01	25.1.2011	JUGENDRA	SK	DS

AS BUILT DRAWING

TITLE EQUIPMENT & STRUCTURE EARTHING DETAILS

						DEPT.	SCALE	DRAWING NO.
						SIGN		TB-4-342-316-005
						DATE		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

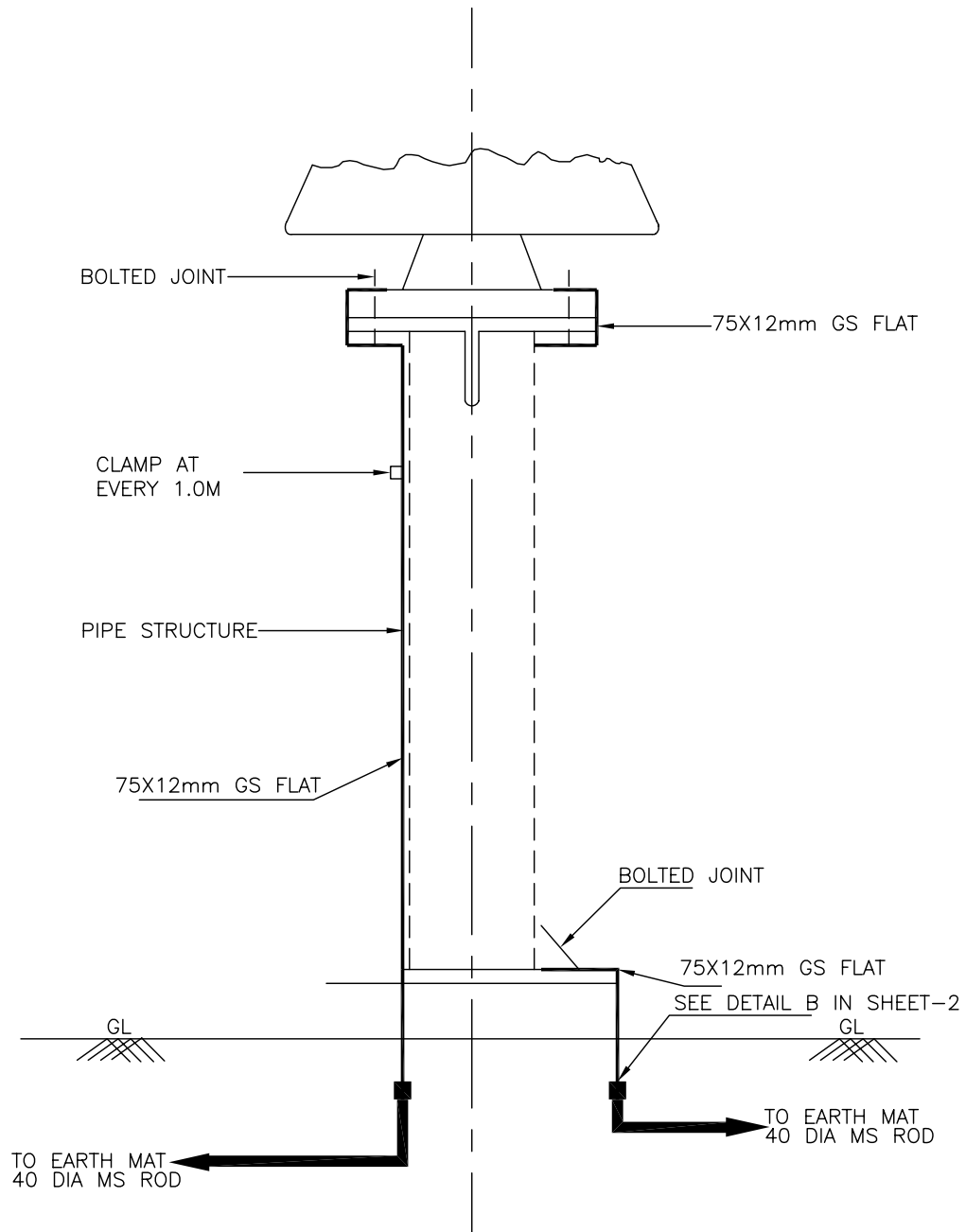
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DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
2

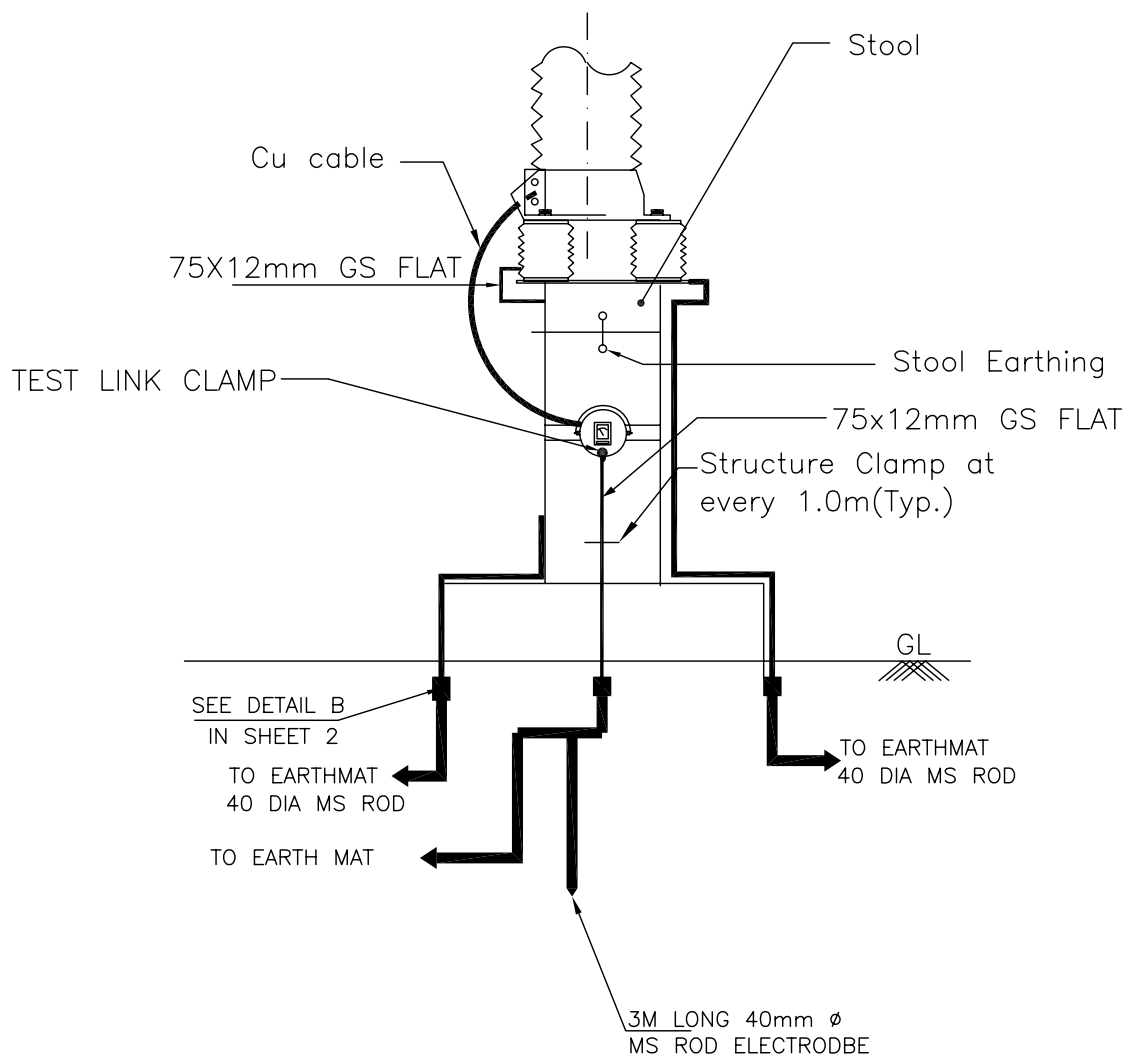


EQUIPMENT EARTHING DETAILS 400kV POST INSULATOR (SOLID CORE TYPE)

DRG. No. TB-4-342-316-005

REV. 00

SHEET No. 3



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 (AS PER SKETCH ABOVE) = 1NO.



EQUIPMENT EARTHING DETAILS

LIGHTNING ARRESTER(390kV)

COMPU. DRG. REF.

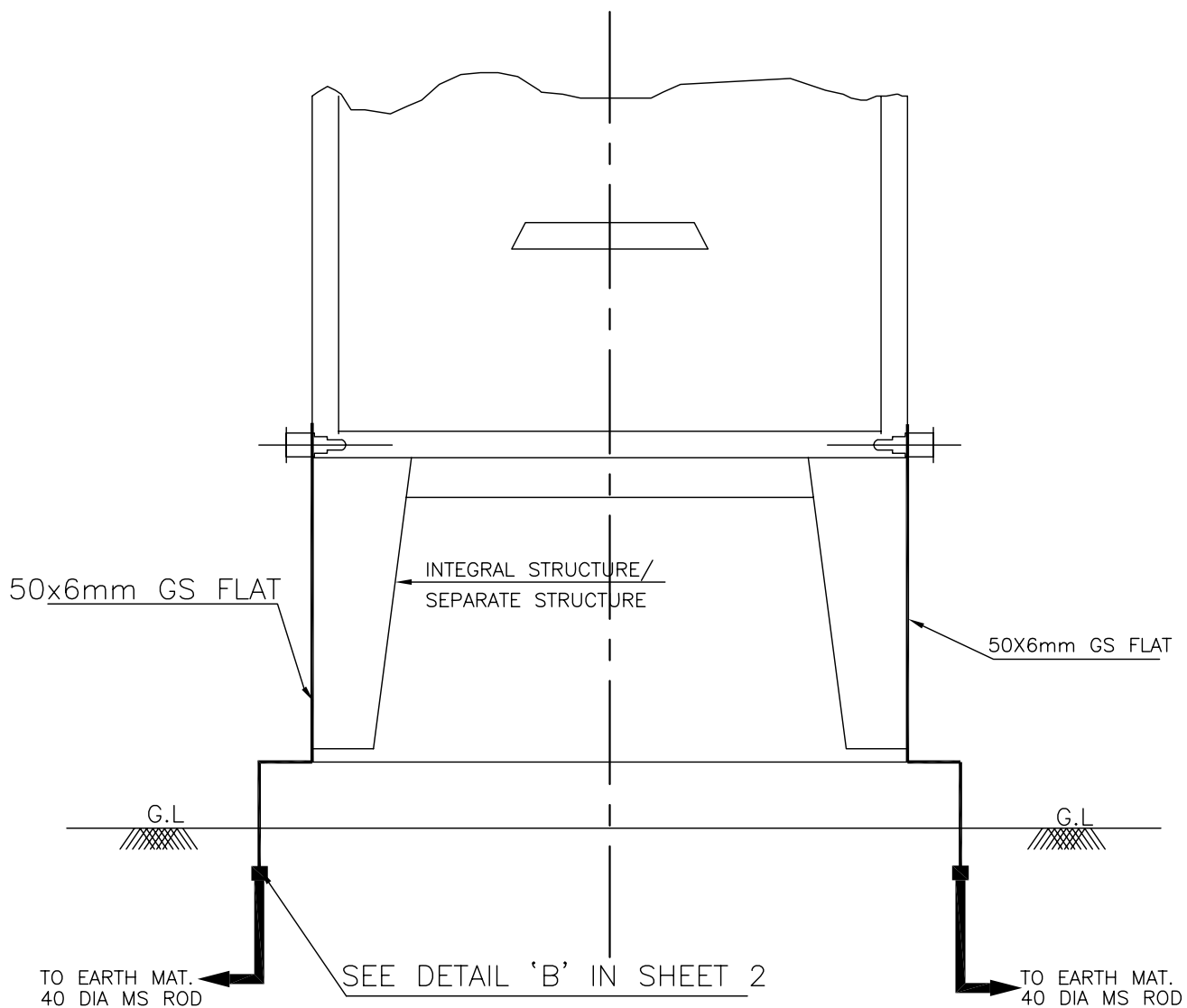
DRG.NO.

TB-4-342-316-005

REV. 00

SHEET No.

4



EQUIPMENT EARTHING DETAILS MARSHALLING KIOSK

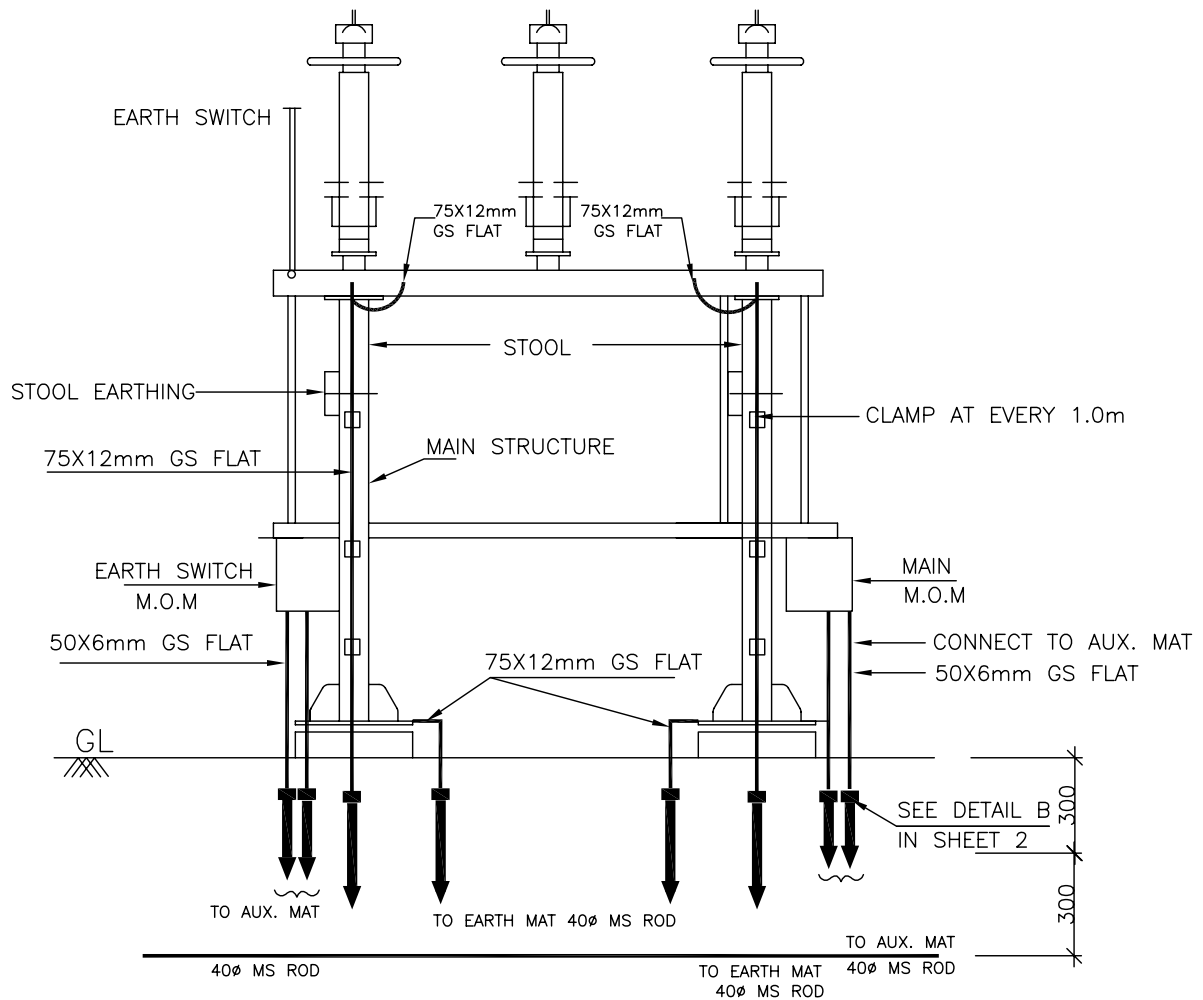
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
5



NOTES

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



EQUIPMENT EARTHING DETAILS

400/220kV DOUBLE BREAK ISOLATOR (TYPICAL) WITH ONE EARTH SWITCH

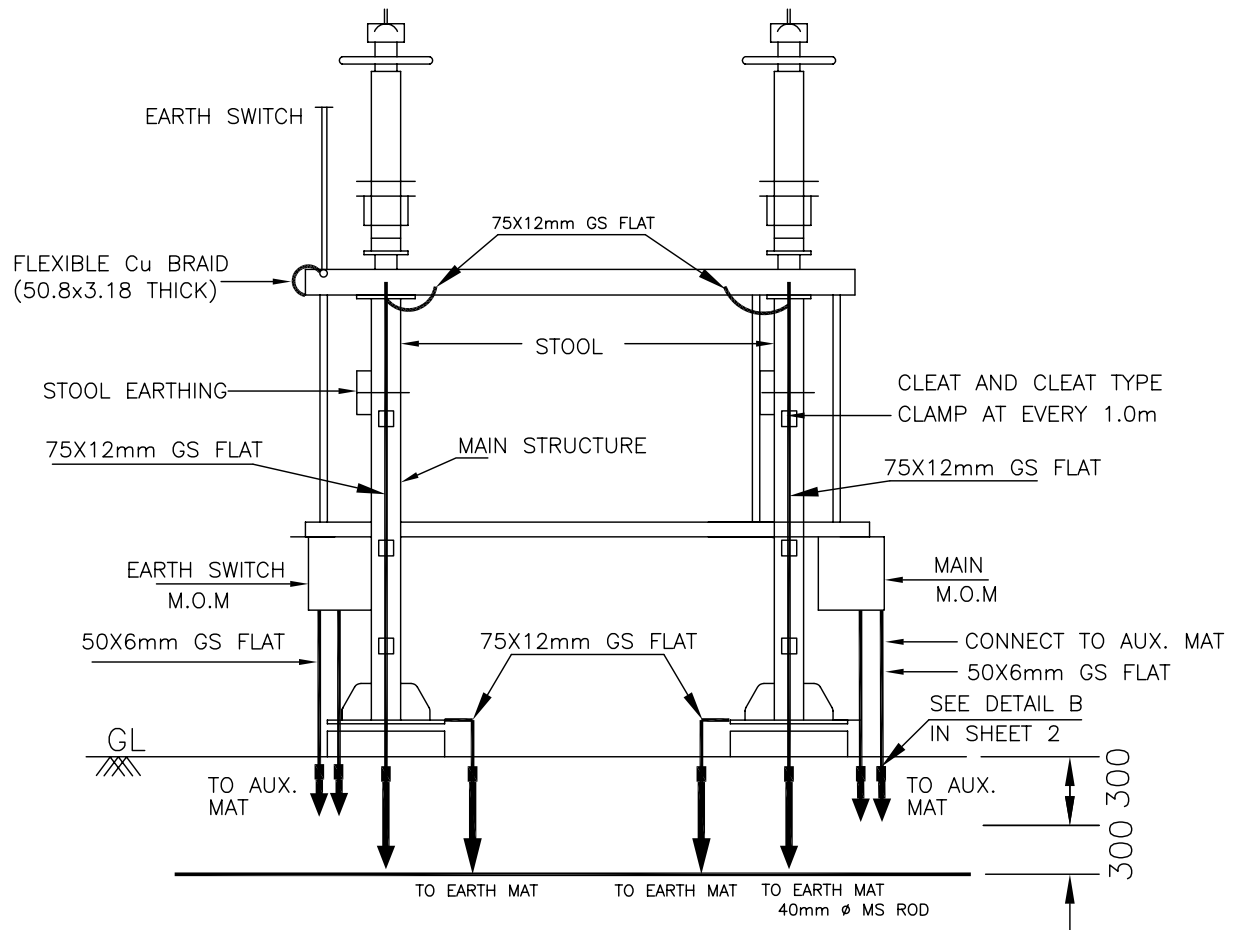
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
6



NOTES

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



EQUIPMENT EARTHING DETAILS

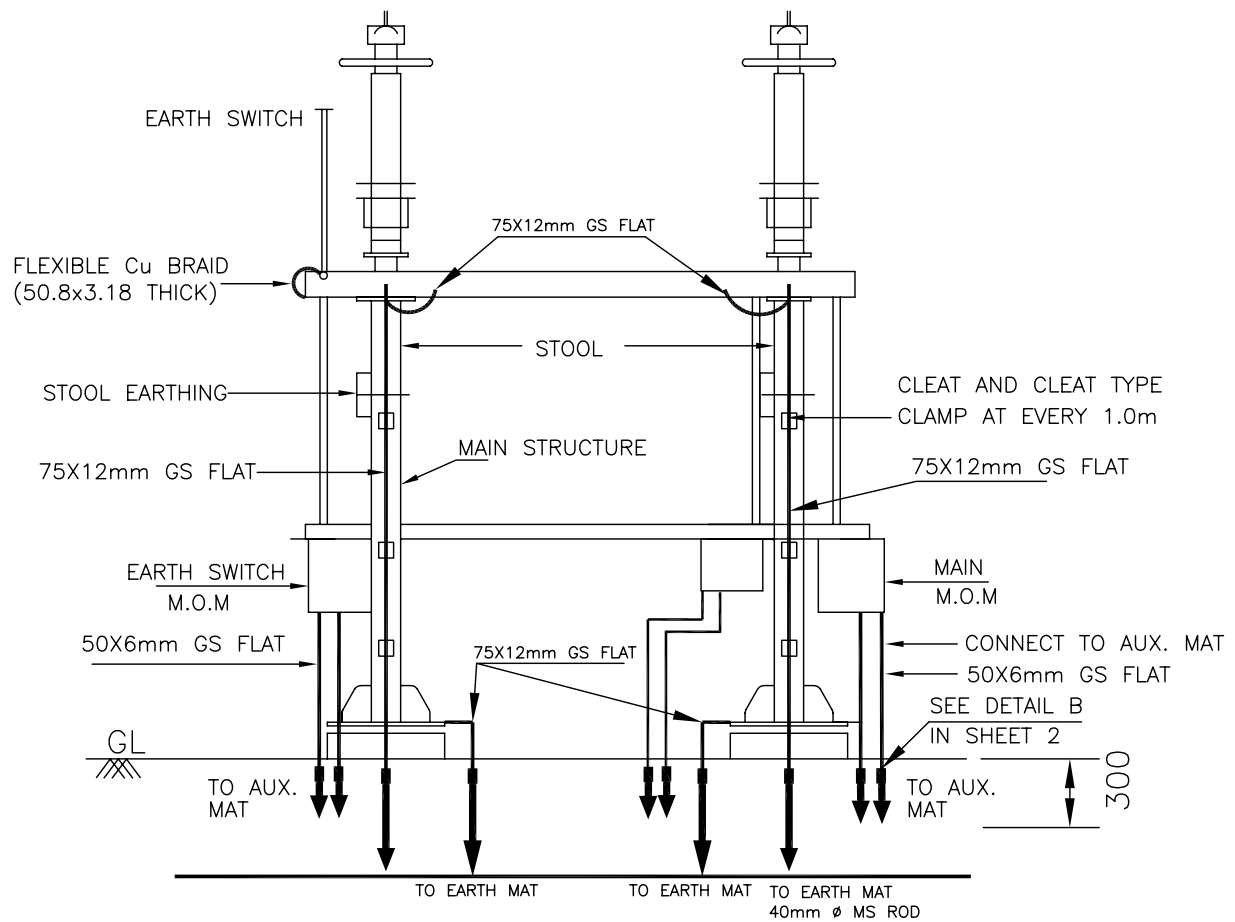
400kV HORIZONTAL CENTER BREAK ISOLATOR WITH 1 E/S

COMPUTERREF.NO.

DRG. No. TB-4-342-316-005

REV. 00

SHEET No.
6A



NOTES

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



EQUIPMENT EARTHING DETAILS

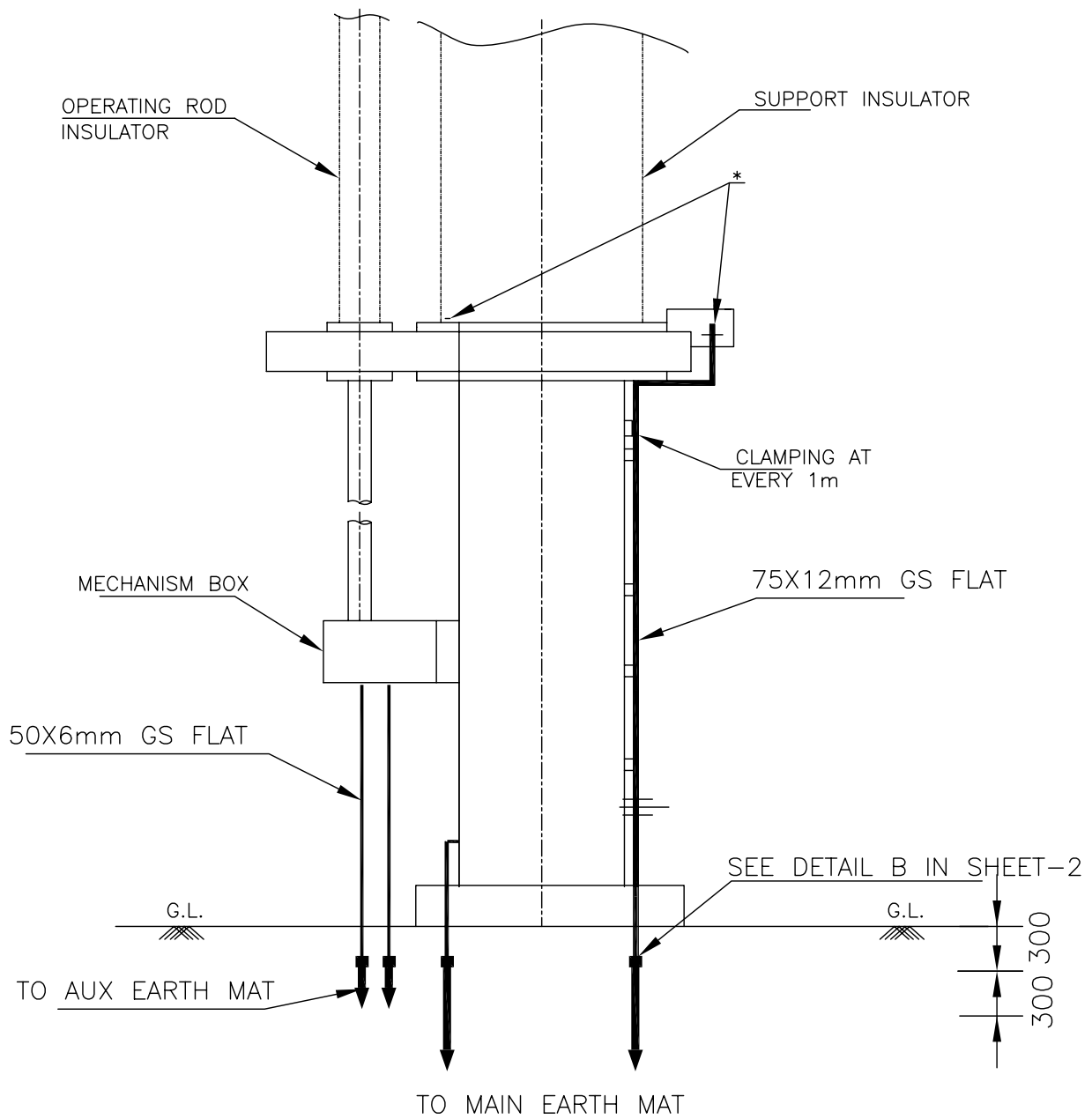
400kV HORIZONTAL CENTER BREAK ISOLATOR WITH 2 E/S

COMPUTERREF.NO.

DRG. No. TB-4-342-316-005

REV. 00

SHEET No.
6B



NOTES

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



EQUIPMENT EARTHING DETAILS

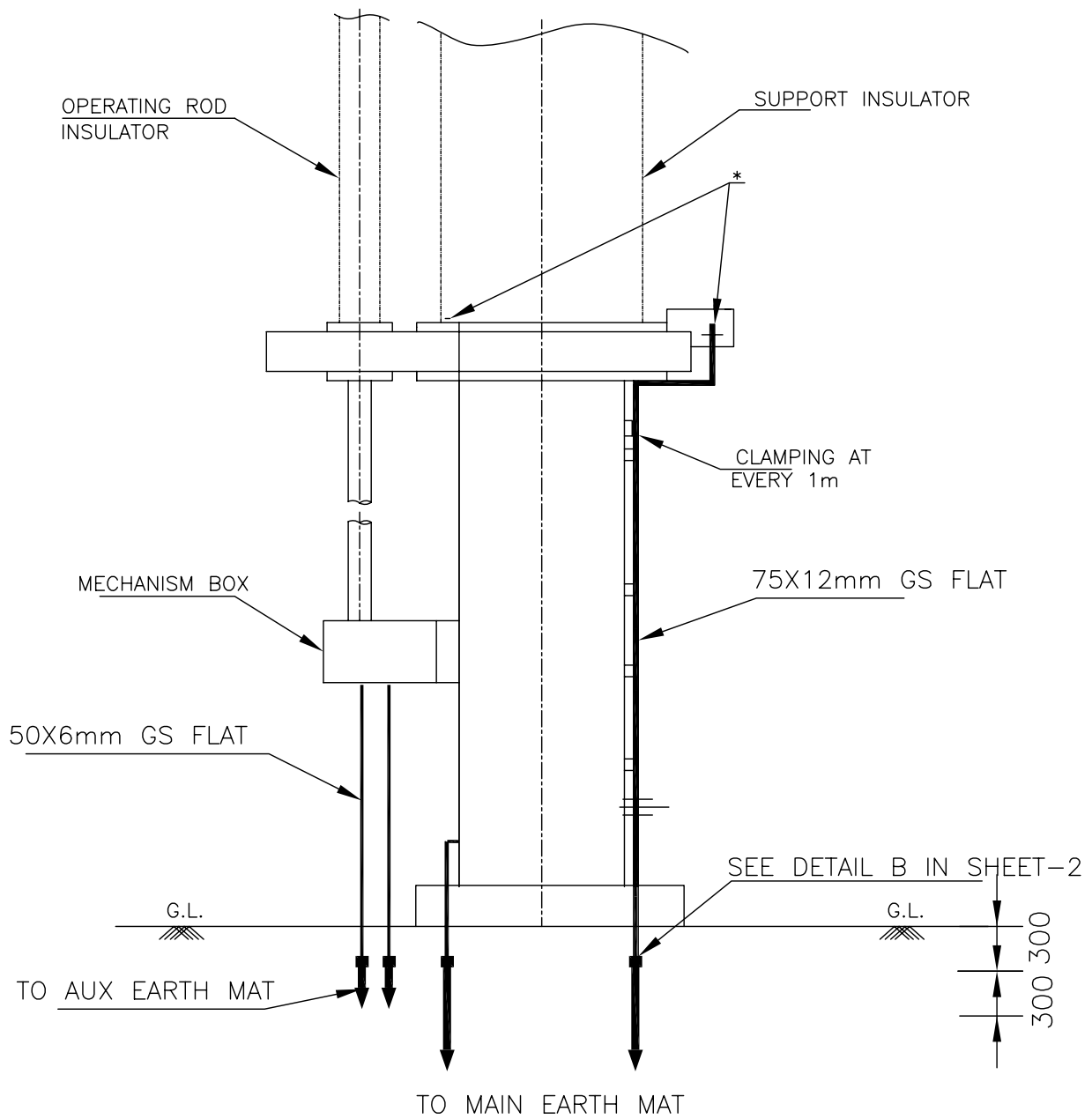
400kV PANTOGRAPH ISOLATOR WITHOUT E/S

COMPUTERREF.NO.

DRG. No. TB-4-342-316-005

REV. 00

SHEET No.
6C



NOTES

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



EQUIPMENT EARTHING DETAILS

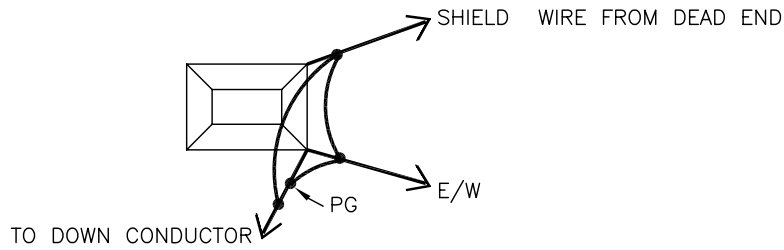
400kV PANTOGRAPH ISOLATOR WITH 1E/S

COMPUTERREF.NO.

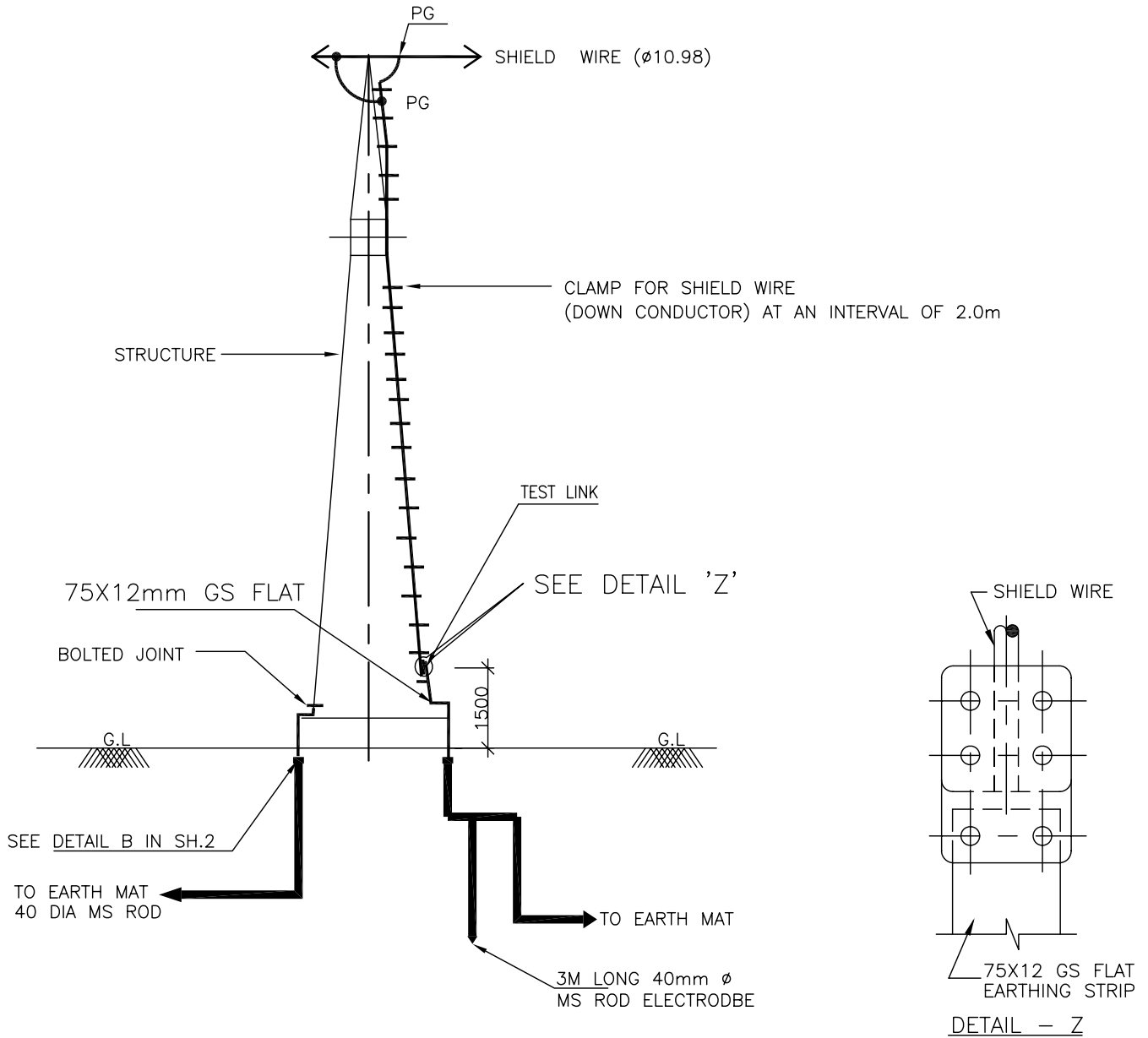
DRG. No. TB-4-342-316-005

REV. 00

SHEET No.
6D



DETAIL WHEN 2 & E/WIRE TERMINATES A TOWER



NOTE:

1. NO. OF ROD ELECTRODE : 1 NO. PER TOWER WITH DOWN CONDUCTOR.



EQUIPMENT EARTHING DETAILS

SHIELD WIRE TOWER

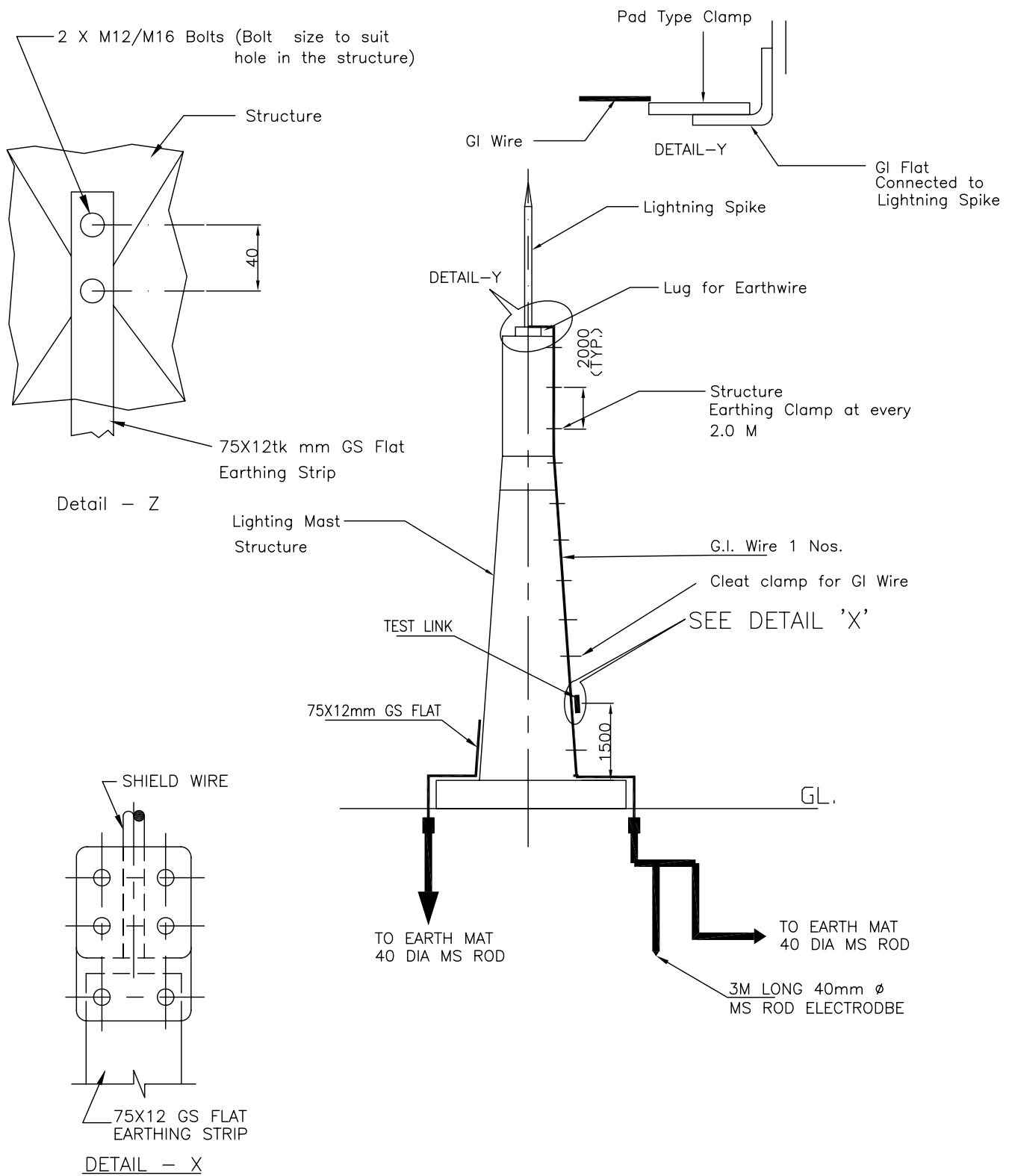
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
7



NOTES:

1. NO. OF ROD ELECTRODE : 1 NO.



EQUIPMENT EARTHING DETAILS LIGHTNING MAST

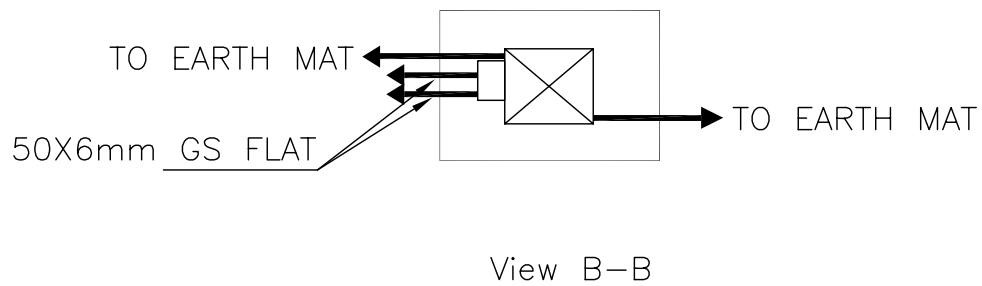
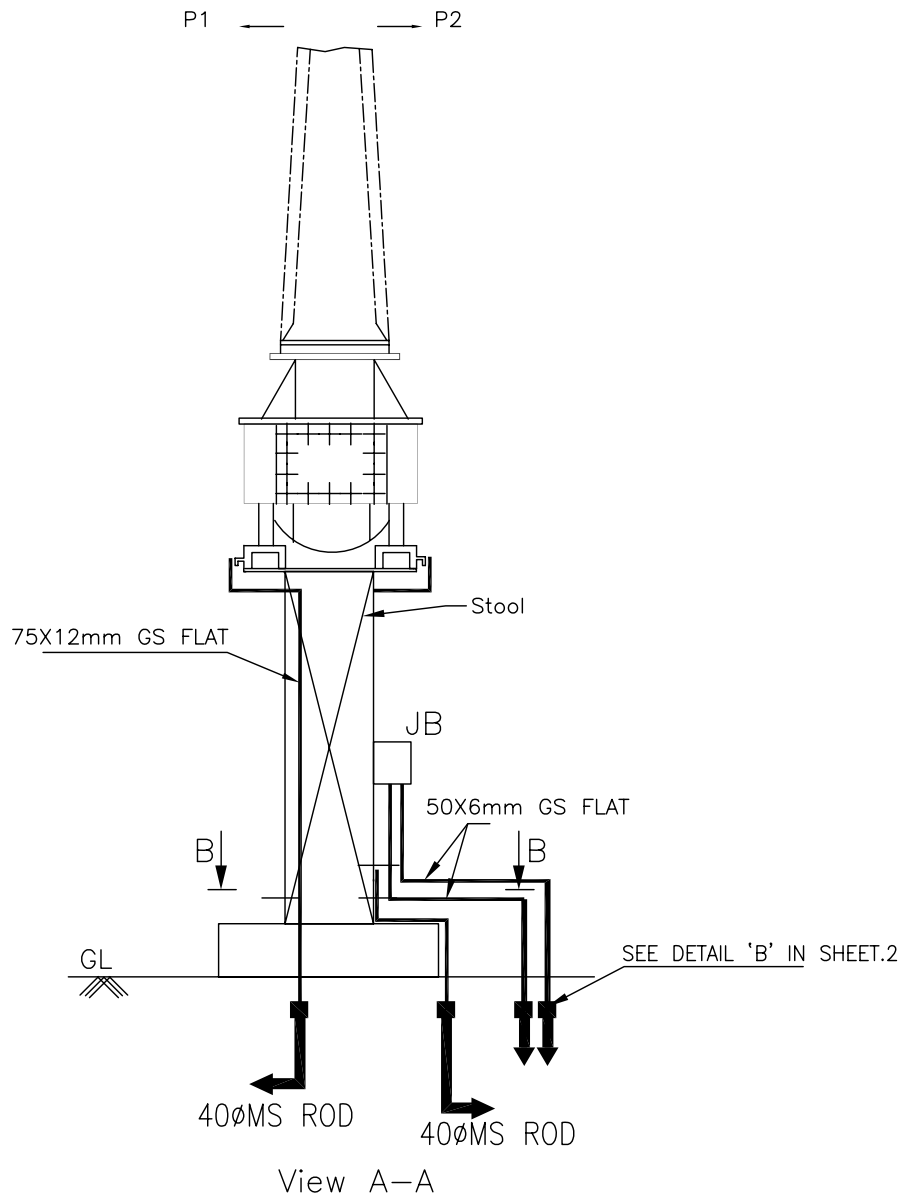
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
7A



EQUIPMENT EARTHING DETAILS 400 kV Current Transformer

COMPU. DRG. REF.

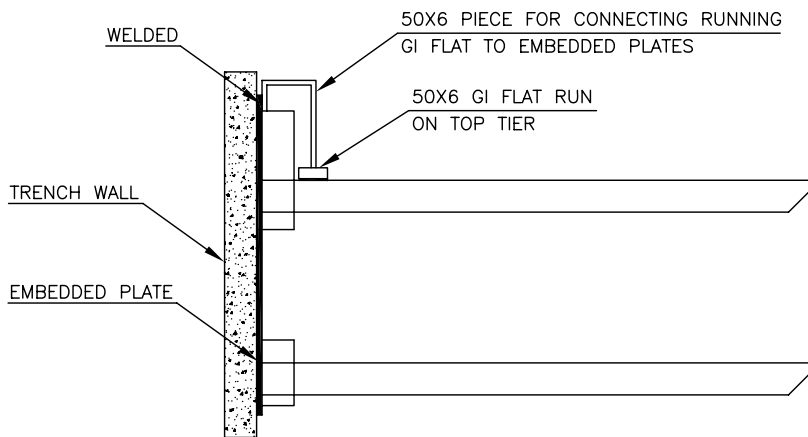
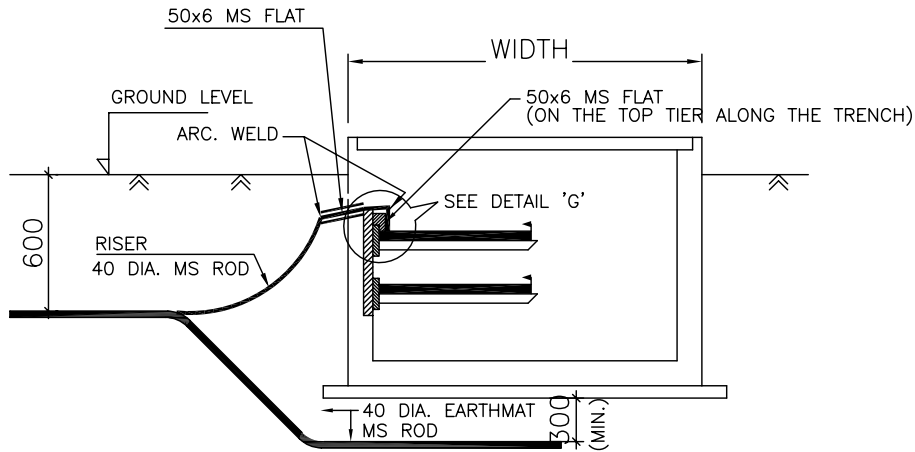
DRG.NO.

TB-4-342-316-005

REV. 00

SHEET No.

8



DETAIL 'G'

DETAIL FOR CONNECTING GI FLAT RUNNING HORIZONTAL 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 (50x6 MS 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.
4. THE MS FLAT SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER & TWO COATS OF POST OFFICE RED ENAMEL PAINT.



EQUIPMENT EARTHING DETAILS CABLE TRENCH

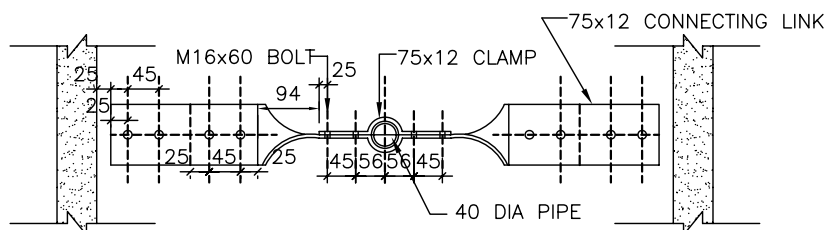
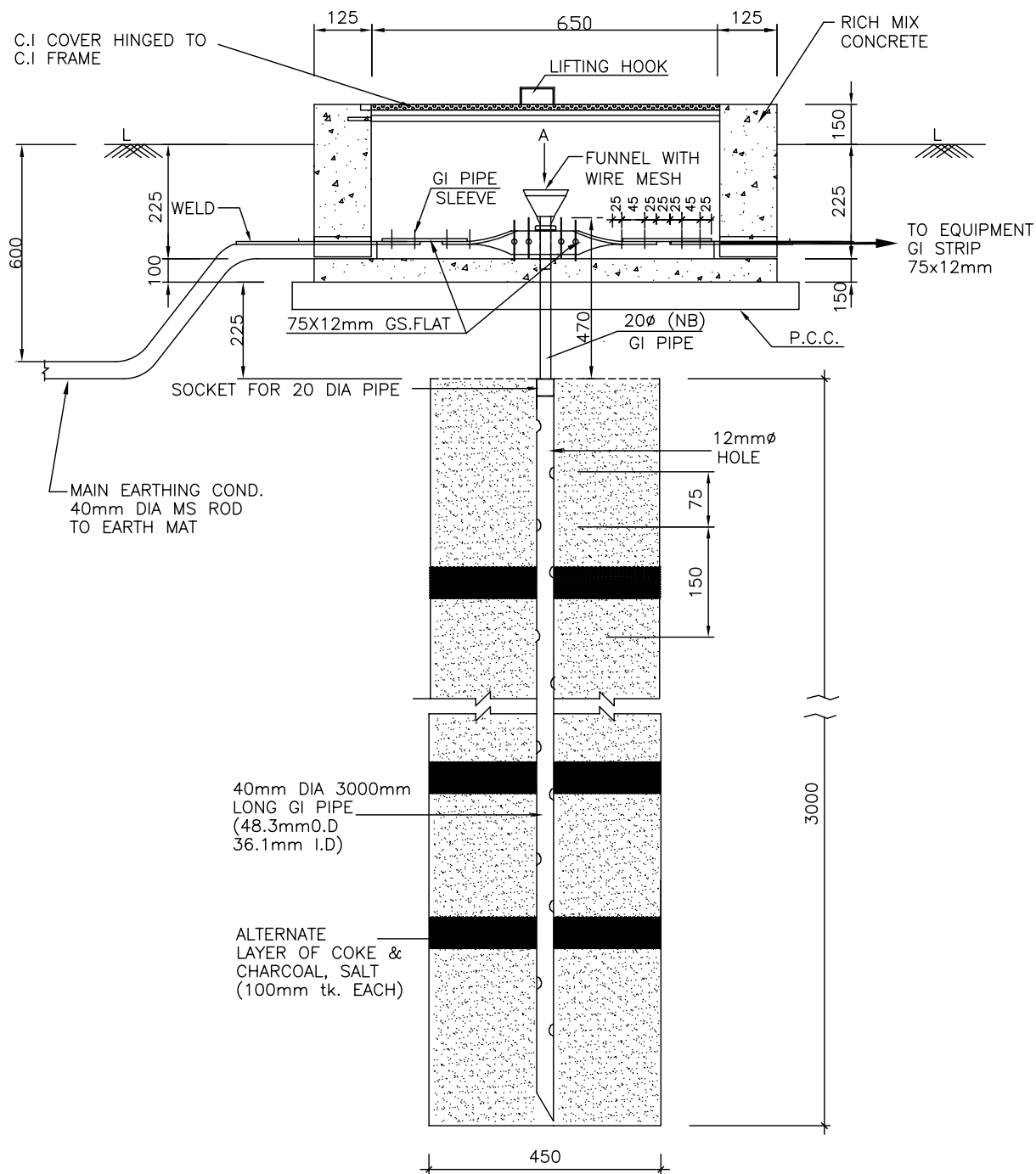
COMPU. DRG. REF.

DRG. NO.

TB-4-342-316-005

REV. 00

SHEET
9



VIEW-A

NOTE:

1. ALL NUTS,BOLTS AND WASHERS, FUNNEL GI PIPE AND WIRE MESH SHALL BE GALVANISED AS PER SPECIFICATION.
2. FUNNEL SHALL BE SECURELY HELD TO THE PIPE.
3. TO BE USED FOR CONNECTING TO NEUTRAL OF POWER TRANSFORMER/REACTOR/NGR



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

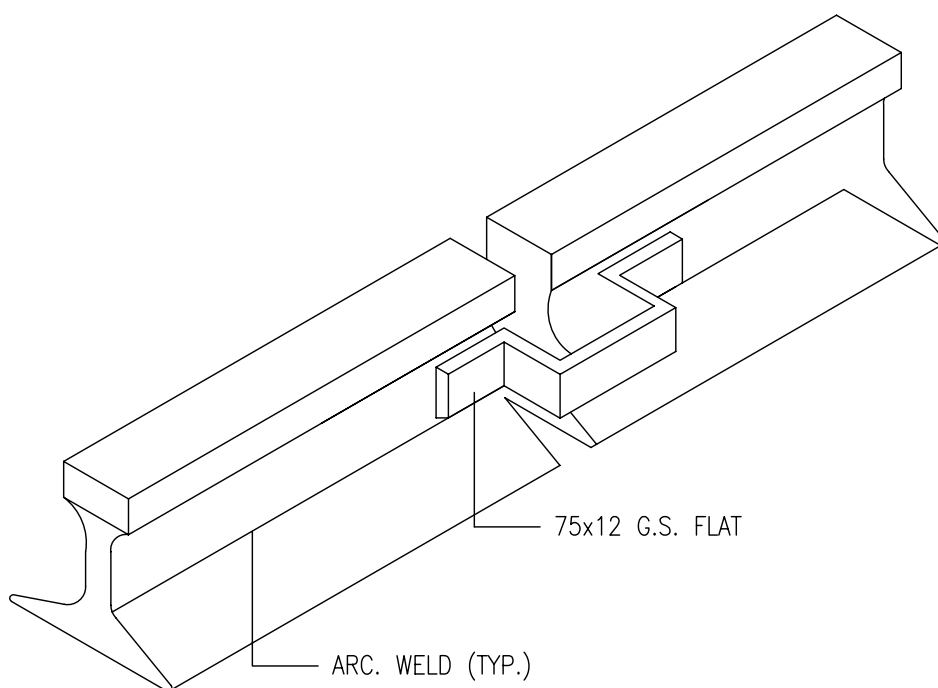
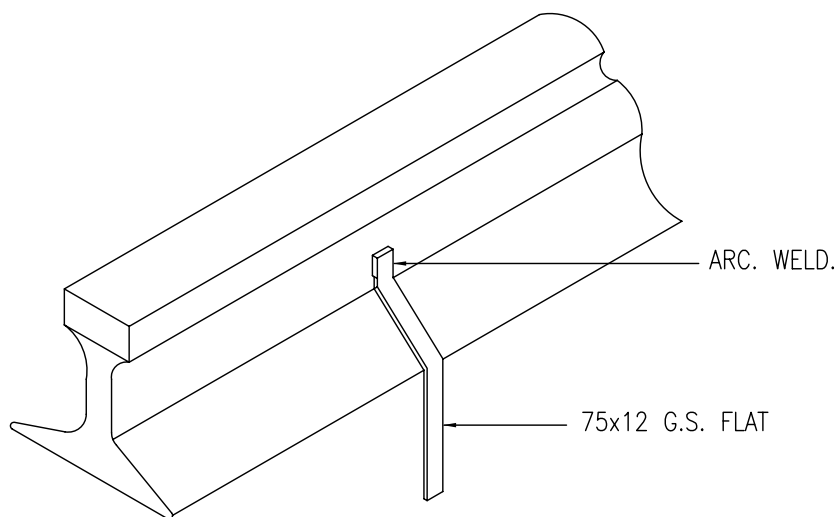
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
10



NOTE:—

1. RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE EARTHED AT BOTH ENDS & AT 30M. SPACING.



EQUIPMENT EARTHING DETAILS

RAIL BONDING

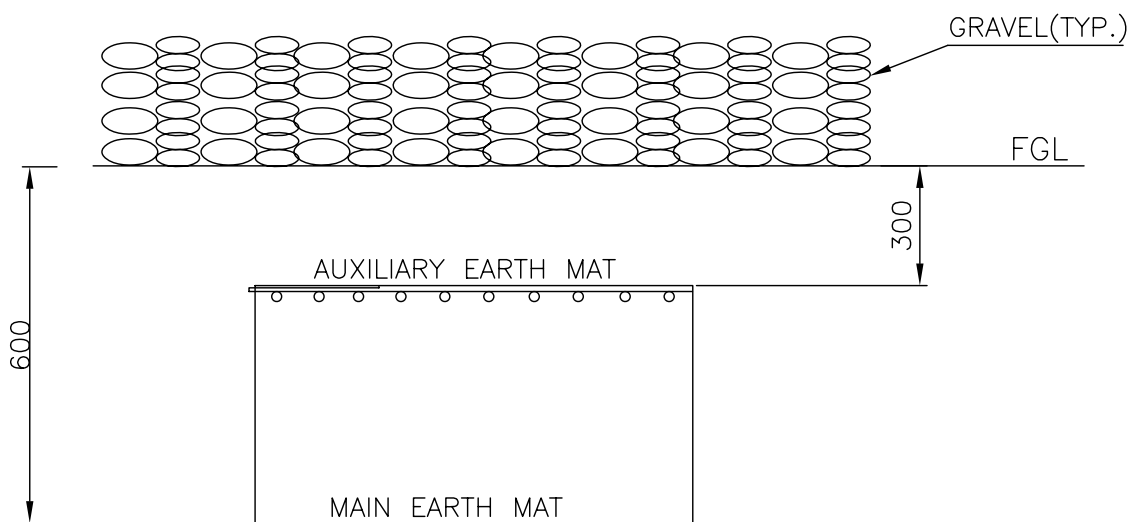
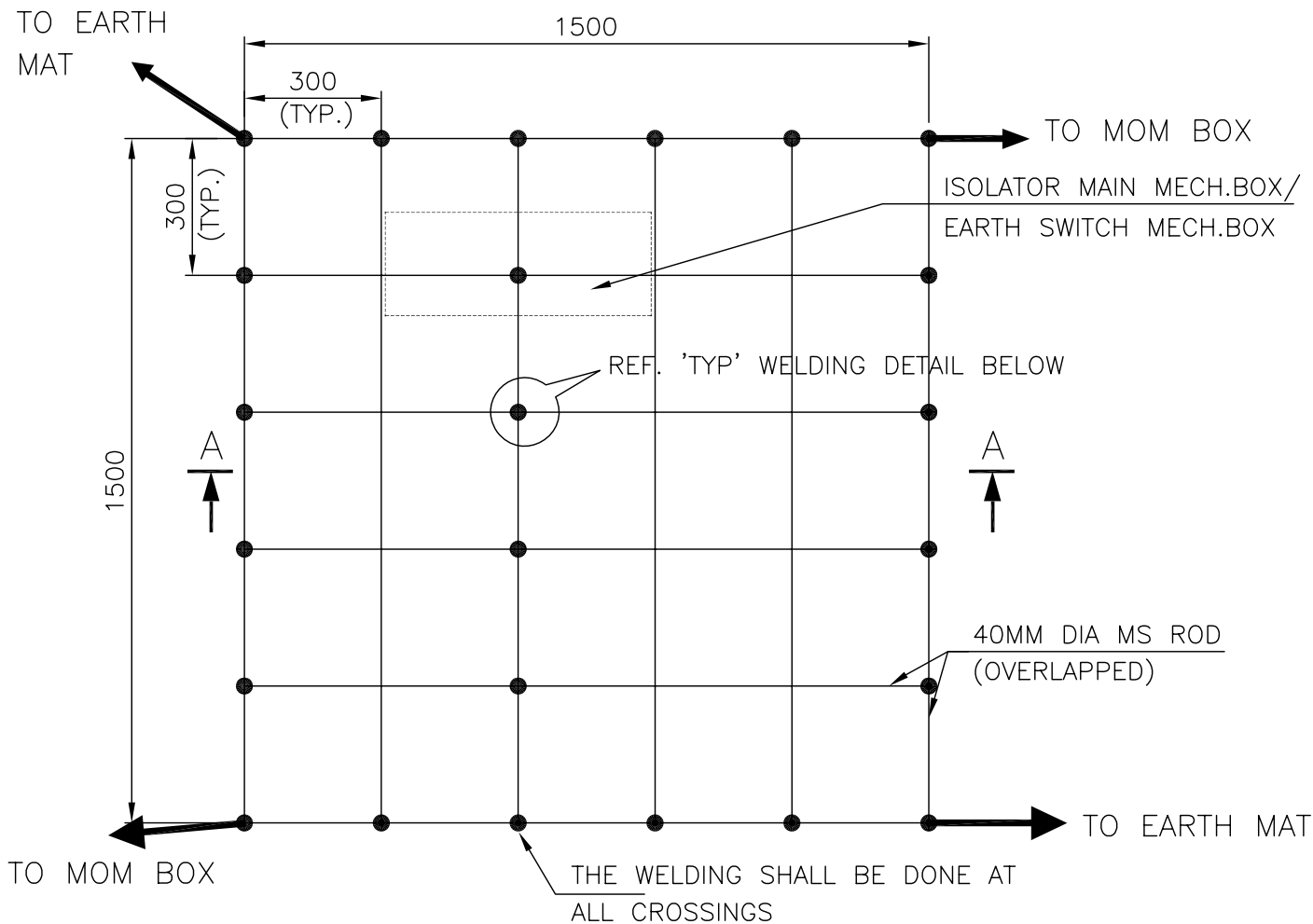
COMPU. DRG. REF.

DRG. NO.

TB-4-342-316-005

REV. 00

SHEET No.
11



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.

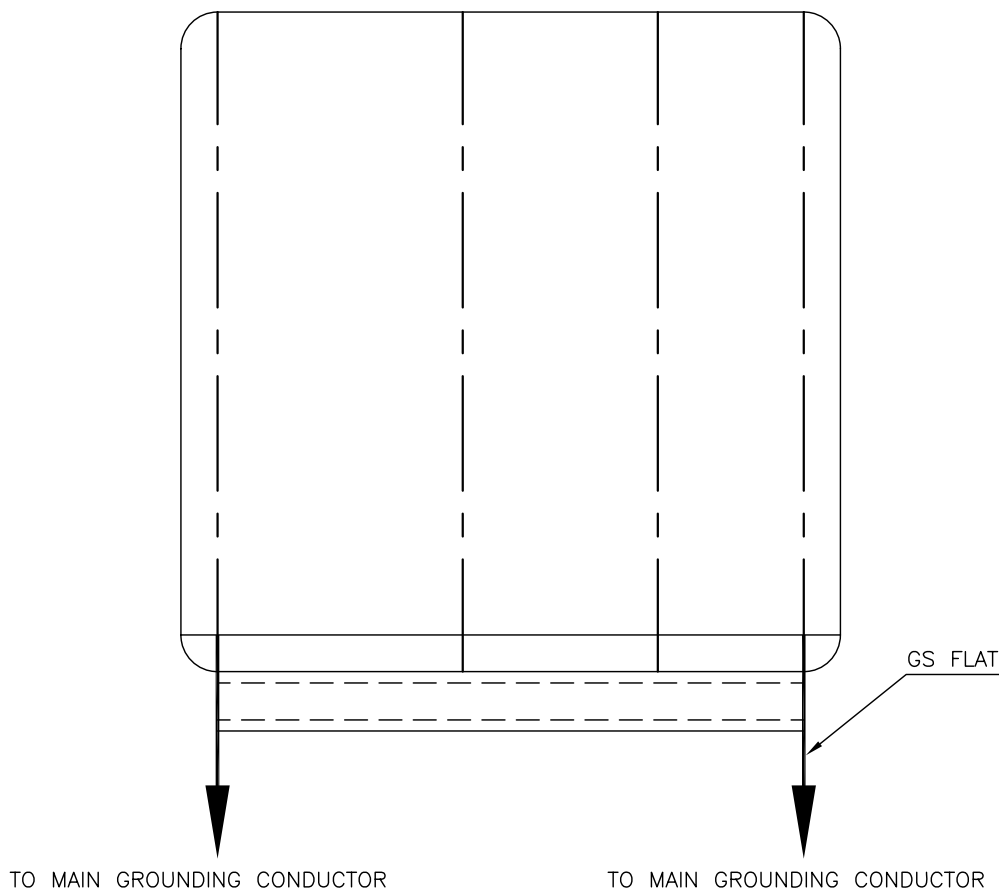
Report No.

TB-4-342-316-005

REV. 01

SHEET No.

12



EQUIPMENT

FLAT SIZE

SWITCHGEAR/ MCC	50X6 MM
AC / DC DISTRIBUTION BOARDS	50X6 MM
CONTROL & RELAY PANELS	50X6 MM
AC KIOSK	50X6 MM



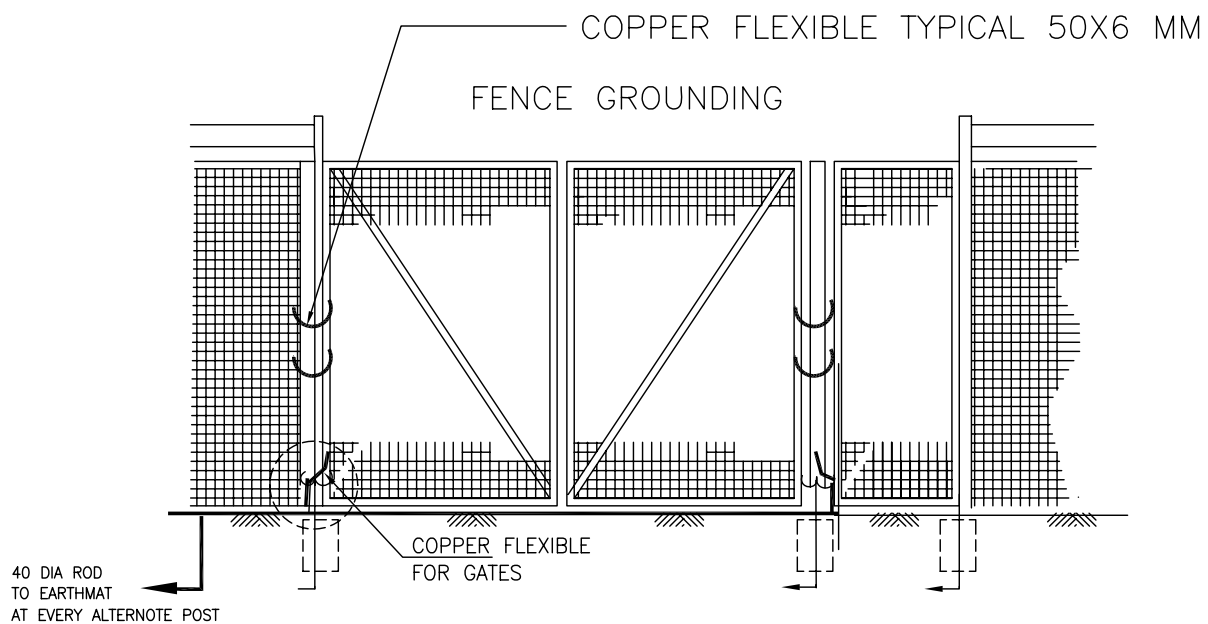
EQUIPMENT EARTHING DETAILS

SWITCHGEAR / MCC / CONTROL AND RELAY BOARD/AC KIOSK

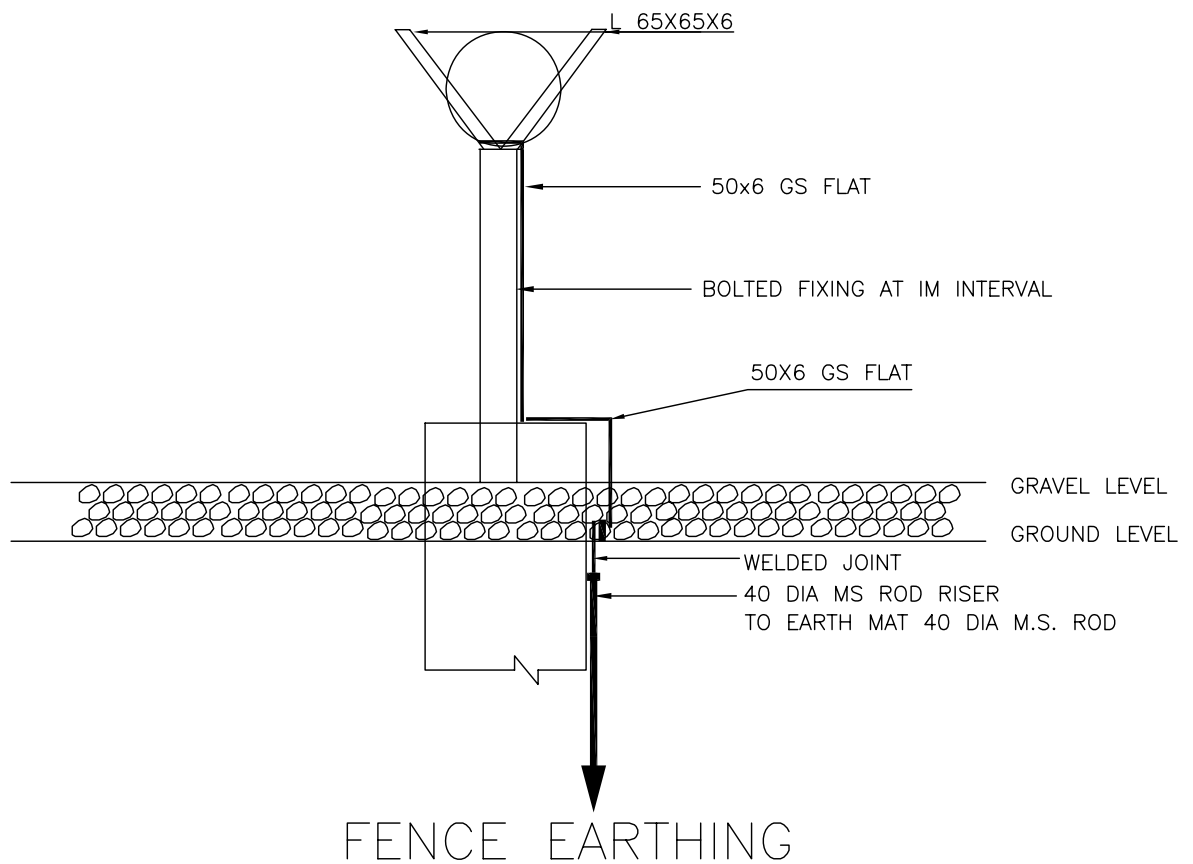
DRG. No. TB-4-342-316-005

REV. 00

SHEET No.
13



EVERY ALTERNOTE FENCE POSTS SHALL BE EARTHED BY 50X6 MM GS FLAT.
50X6 FLAT SHALL BE WELDED TO 65X65X6 ANGLES FORMING V-SHAPE AT THE TOP OF FENCE



EQUIPMENT EARTHING DETAILS FENCE POST

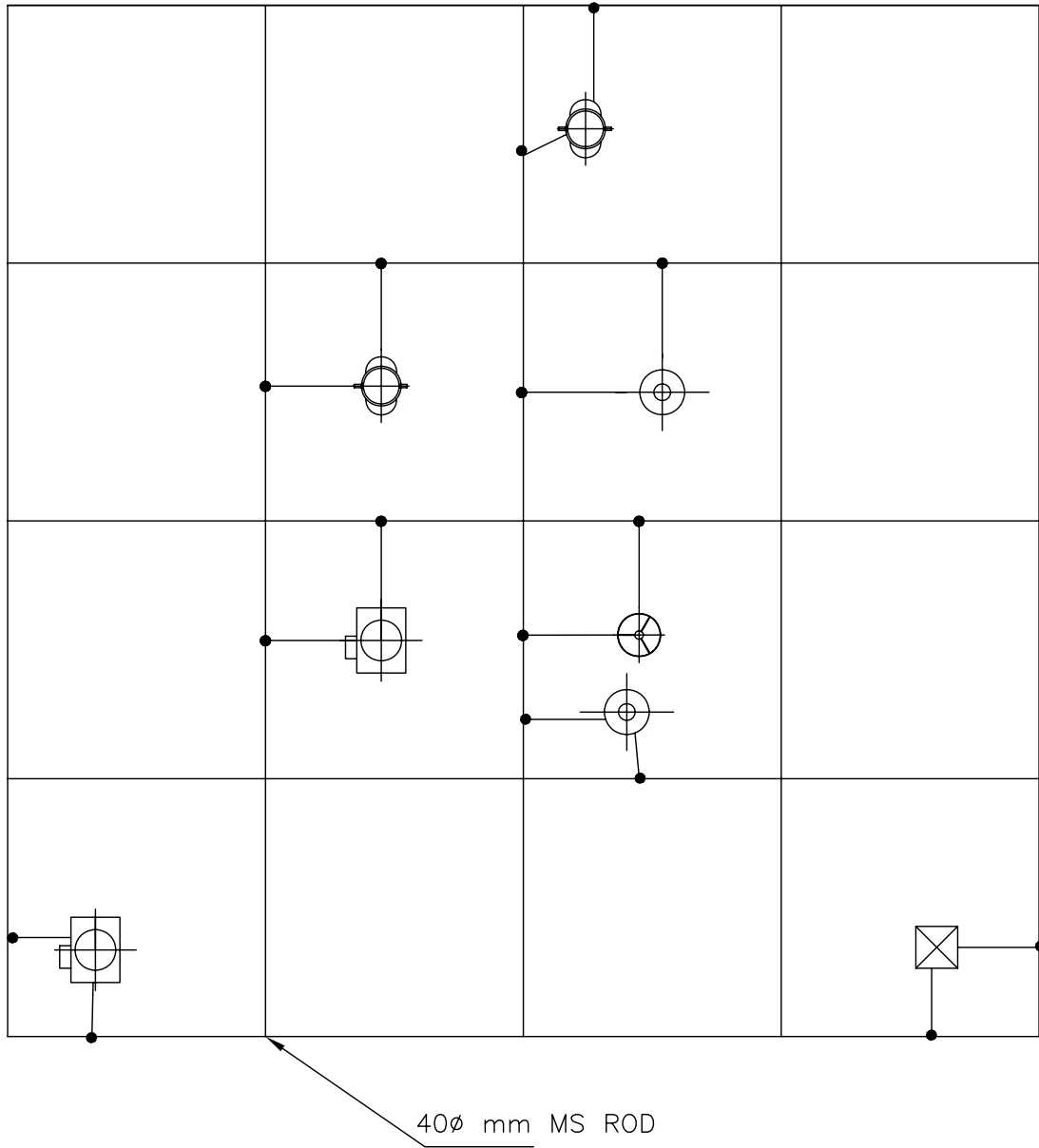
DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
15

MAIN EARTHMAT GRID



• —RISER



EQUIPMENT EARTHING DETAILS

TYPICAL ARRANGEMENT OF EQUIPMENT EARTHING WITH MAIN GRID

COMPU. DRG. REF.

DRG. NO.

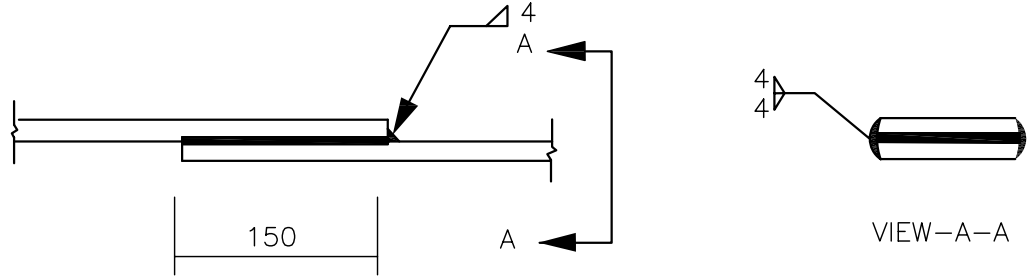
TB-4-342-316-005

REV. 00

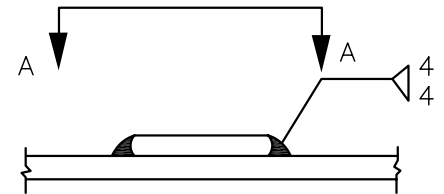
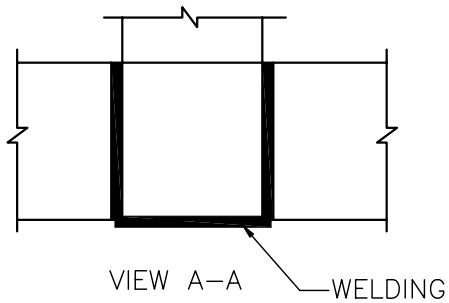
SHEET No.
16

STRIP TO STRIP

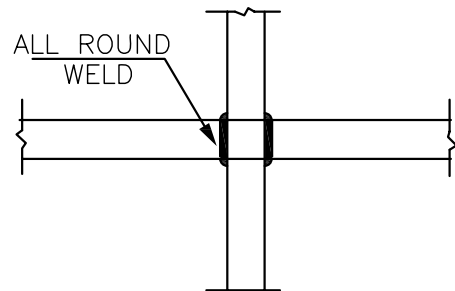
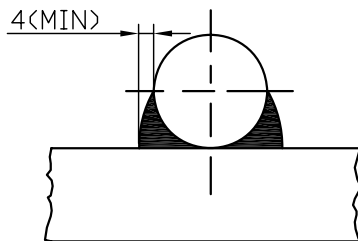
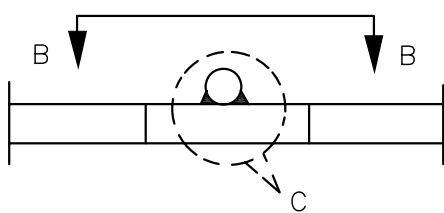
1. STRAIGHT LAP JOINT/RISER



2. CROSS LAP JOINT



RIGHT ANGLED JOINT (ROD TO ROD)



EQUIPMENT EARTHING DETAILS WELDING DETAIL

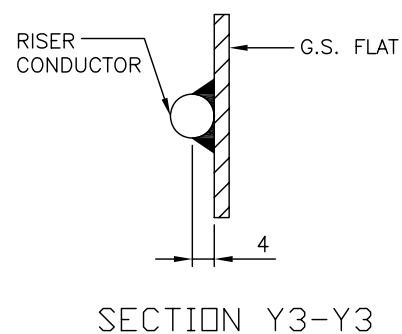
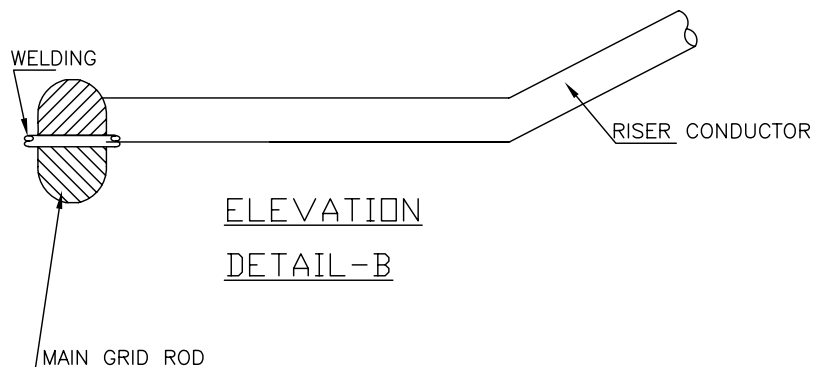
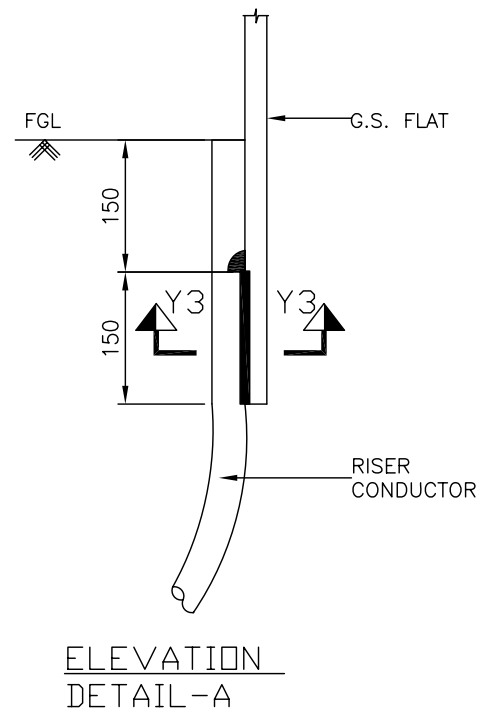
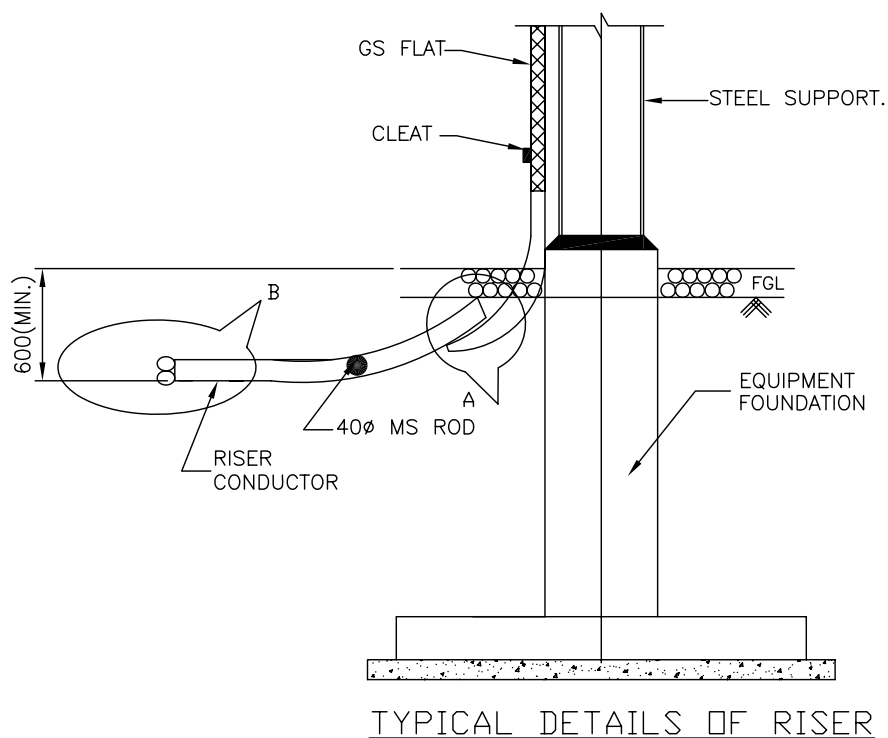
COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
17



EQUIPMENT EARTHING DETAILS WELDING DETAILS

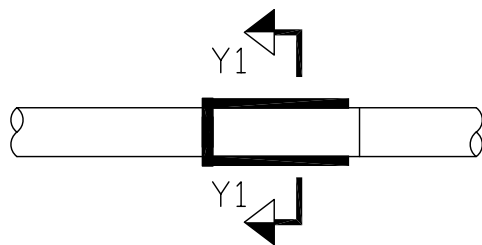
COMPUTER REF. NO.

DRG. No.

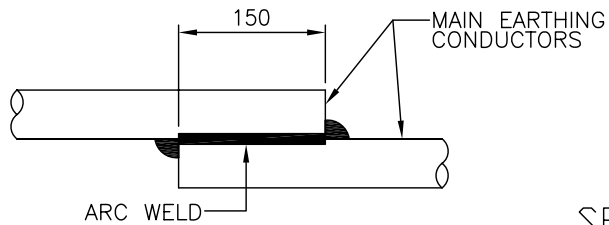
TB-4-342-316-005

REV. 00

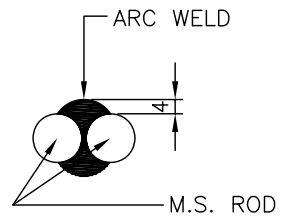
SHEET No.
17A



ELEVATION

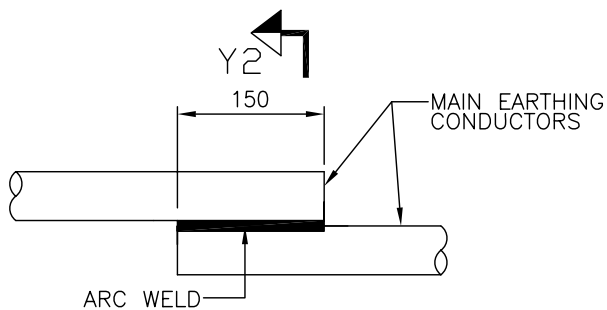


PLAN

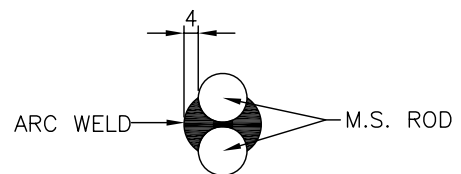


SECTION Y1-Y1

<CONDUCTOR IN HORIZONTAL PLANE>



PLAN



SECTION Y2-Y2

<CONDUCTOR IN VERTICAL PLANE>



EQUIPMENT EARTHING DETAILS WELDING DETAILS

COMPUTERREF.NO.

DRG. No.

TB-4-342-316-005

REV. 00

SHEET No.
17B

ANNEXURE-I

REVD DATE

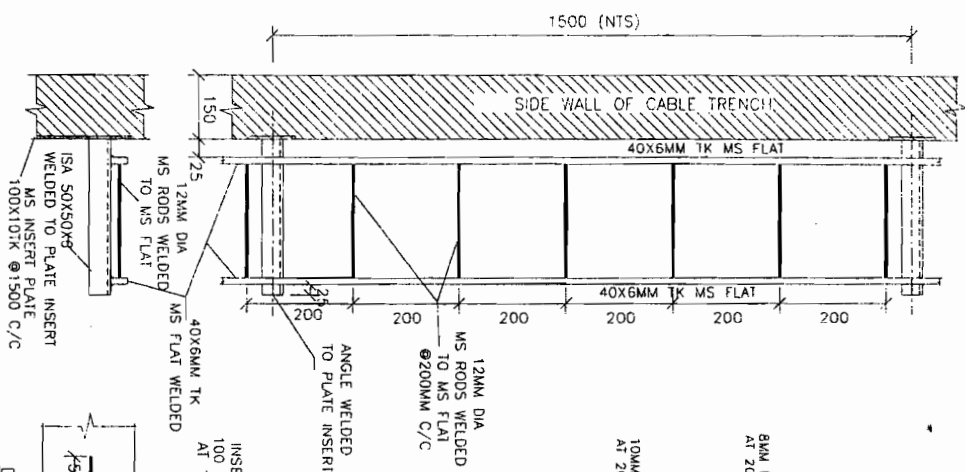
FNAME

USER

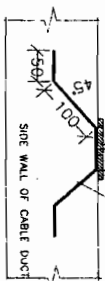
NOTES:

1. ALL DIMENSIONS ARE IN MMS ONLY UNLESS OTHERWISE SPECIFIED.
2. STRUCTURAL CONCRETE SHALL BE OF M20 GRADE.
3. LEAN CONCRETE SHALL BE OF 1:4:8 - 75MM TK.
4. LAP/ANCHOR LENGTH SHALL BE 50 TIMES THE DIA OF BARS UNLESS OTHERWISE SPECIFIED.
5. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE AS FOLLOWS:
ITEMS TOP BOTTOM SIDE
BASE SLAB 25MM 40MM 40MM
PRECAST COVER 13MM 25MM 25MM
WALL: 25MM (INSIDE FACE) 40MM (EARTH FACE)
6. SUITABLE SLOPE MAY BE PROVIDED FOR DRAINING OF WATER COLLECTED KEEPING THE MIN DEPTH OF DUCT AS SHOWN IN C/S
7. THE CONTROL & POWER CABLES FROM MAIN CABLE DUCT TO THE RESPECTIVE EQUIPMENTS MAY BE RUN VIA COMBINATION OF 150MM DIA HUMME PIPES.
8. HUMME PIPE OF 300MM DIA (MIN) SHALL BE PROVIDED TO DRAIN OUT THE WATER TO OUTER DRAIN AT CONVENIENT POINTS. SUITABLE MS GRILL MAY BE PROVIDED AT EITHER ENDS OF THE HUMME PIPE TO PREVENT ENTRY OF REFILLERS ETC INTO CABLE DUCT.
9. LONGITUDINAL SLOPE OF 1 IN 500 & CROSS SLOPE OF CABLE DUCTS SHALL BE PROVIDED FOR DRAINING WATER IN CABLE DUCTS.

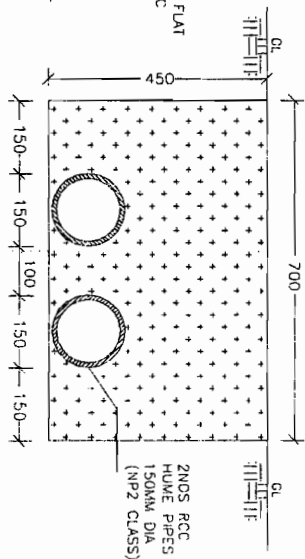
CABLE TRAY DETAILS
(TYPICAL)



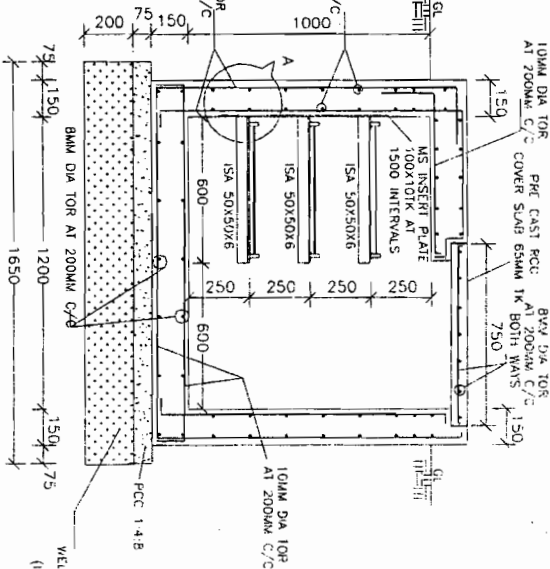
DETAILS OF INSERT PLATE



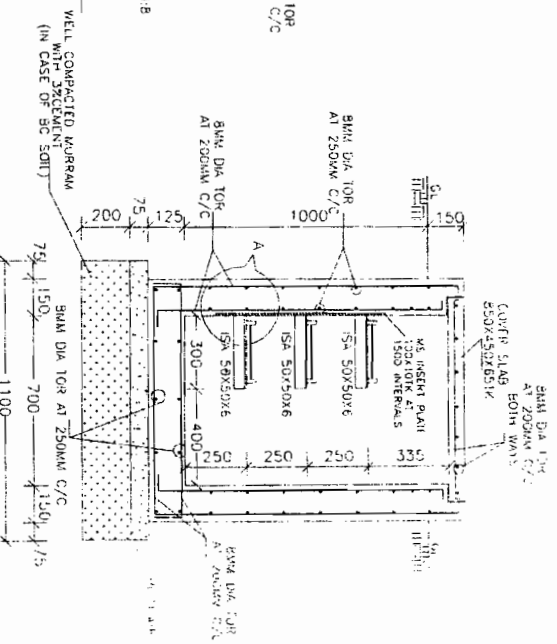
CABLE DUCT TYPE "C"
700MM X 450MM DEEP



CABLE DUCT TYPE "C" (1200X1000)



DUCT TYPE "D" (700X1085)



KARNATAKA POWER TRANSMISSION CORPN LTD

DETAILS OF CABLE DUCT 'C' & 'D'
FOR 220KV STATIONS

DRC NO: CFE (P&C) / SE(CMCL) / 06-07/230/SOMI

SHEET: 2 OF 2