

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED			CHECKED
		APPROVED			APPROVED			APPROVED

LEGEND





CONNECTION TO GROUND MAT THROUGH RISER.

SHEET NO.	DESCRIPTION
01.	TITLE
1A.	NOTES
02.	220kV, POST INSULATOR (SOLID CORE TYPE)
03.	220kV CAPACITIVE VOLTAGE TRANSFORMER
04.	220kV WAVE TRAP
05.	220kV HORIZONTAL DOUBLE BREAK ISOLATOR (TYPICAL) WITH ONE EARTHSWITCH
06.	AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S MECH. BOX
07.	CONTROL AND RELAY PANELS
08.	TOWER WITH PEAK
09.	CABLE HANGER
10.	ROD EARTH ELECTRODE WITHOUT TEST PIT
11.	ROD EARTH ELECTRODE WITH TEST PIT
12.	TYPICAL ARRANGEMENT OF BOLTED JOINTS
13.	TYPICAL ARRANGEMENT OF RISER
14.	WELDING DETAILS
15.	WELDING DETAILS

REFERENCE DRAWING

DWG. NO.	TITLE

ADDITIONAL INFORMATION				PROJECT		220kV GIS for 2x60 MW VYASI HEP					
STATUS OF DRAWING				CUSTOMER		UJVNL LTD.					
DISTRIBUTION OF PRINTS											
DRN	NAME	SIGN	DATE	NO. OF VAR	CONTRACTOR	<div><div>बीएचईएल</div><div></div><div>BHARAT HEAVY ELECTRICALS LTD.</div><div>TRANSMISSION BUSINESS GROUP</div></div>					
	GV										
CKD	MM										
APPD	VK										
SUB-SUPPLIER/VENDOR				ISSUED BY DEPT TBEM	UNTOL.DIMS. GR.	ANGLE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEM
				DEPT. CODE 316			NTS				
				TITLE					DRAWING NO.		REV.
				EQUIPMENT EARTHING DETAILS					TB-4-398-316-016		00
									SHT. No. 01	NO. OF SHT. 16	

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

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GENERAL NOTES:

1. EARTH STRIP CLEATED TO LATTICE TYPE STRUCTURE AT AN INTERVAL OF 750mm.
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. THE MAIN GROUND GRID SHALL BE BURIED IN EARTH AT A MINIMUM DEPTH OF 600 MM BELOW GROUND LEVEL.
4. THE GROUND GRID CONDUCTOR BELOW GROUND LEVEL SHALL BE OF 2X75X12 GI FLAT. GROUND ELECTRODE SHALL BE 40MM ϕ X 3000 MM LONG MILD STEEL ROD, DRIVEN INTO THE GROUND AND CONNECTED TO THE GROUND GRID CONDUCTOR.
5. RISER/PIGTAIL FROM THE GROUND GRID SHALL BE 75X12 GI FLAT. AND SHALL PROJECT 300 MM ABOVE FINISHED GROUND/CONCRETE FLOOR LEVEL.
6. ALL GROUND CONNECTIONS BELOW GROUND SHALL BE MADE BY ELECTRIC ARC WELDING WITH **LOW HYDROGEN CONTENT ELECTRODE**. BENDING OF THE CONDUCTOR WHERE NECESSARY SHALL BE DONE BY GAS HEATING.
7. GROUND CONDUCTOR CONNECTIONS ABOVE GROUND SHALL BE GENERALLY MADE BY ELECTRIC ARC WELDING. THE CONNECTION SHALL BE COATED WITH COLD GALVANISING/WEATHER RESISTANT PAINTS.
8. BOLTED CONNECTION SHALL BE MADE ONLY FOR GROUNDING OF EQUIPMENT/ DEVICES AND SOME REMOVABLE STRUCTURES. THE CONTACT SURFACES SHALL BE THOROUGHLY CLEANED BEFORE CONNECTION TO ENSURE GOOD ELECTRICAL CONTACT.
9. 36MM ϕ X3000MM LONG MILD STEEL GROUND ROD ELECTRODES SHALL BE PROVIDED AT CONNECTIONS WITH LIGHTNING ARRESTERS, CVT NEUTRALS AND SHIELD WIRE TOWER.
10. THE GROUNDING INSTALLATION WORK SHALL CONFORM TO THE REQUIREMENTS OF THE INDIAN ELECTRICITY RULES AND CODE OF PRACTICE FOR EARTHING (IS:3043) AS AMENDED UP-TO-DATE IN INDIA.
11. GI FLAT RISERS SHOULD BE BROUGHT CLOSE TO EQUIPMENTS FOUNDATION.
12. EARTH WIRE DOWN CONDUCTOR SHALL BE CLEATED AT AN INTERVAL OF 2000MM ALONG WITH STRUCTURE.
13. FOR WELDING DETAILS REFER SHEET NO. 14 & 15.



EQUIPMENT EARTHING DETAILS

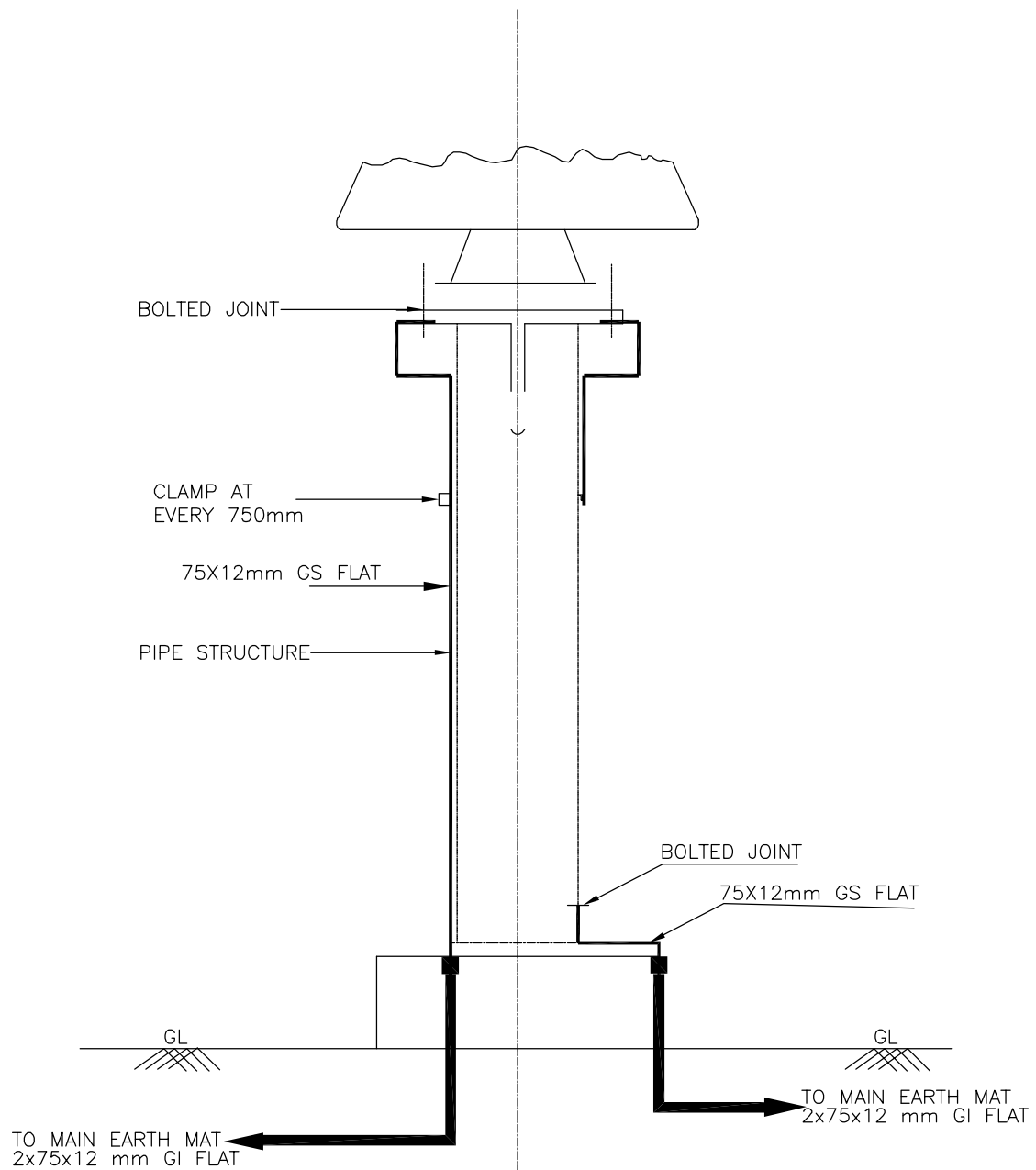
NOTES

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
1A



NOS.OF RISERS = 2 NOS.



EQUIPMENT EARTHING DETAILS

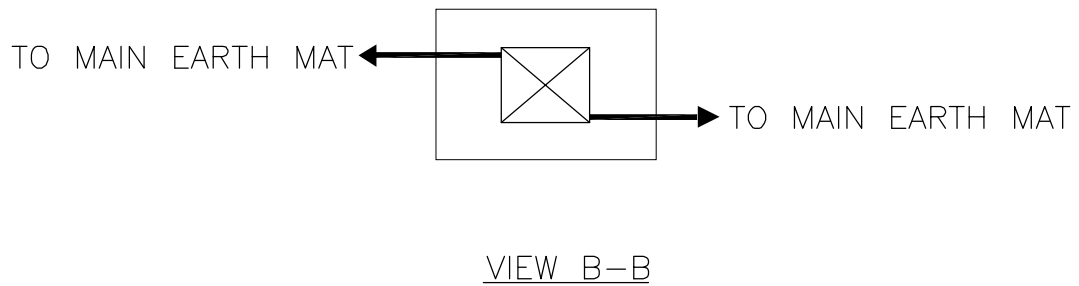
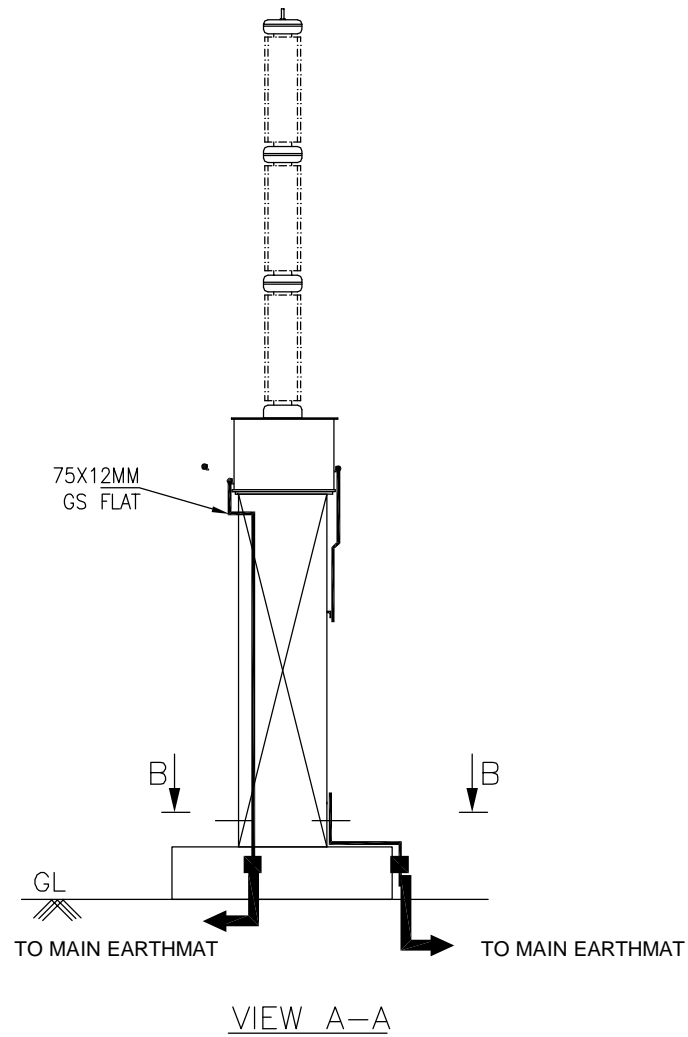
220kV, AIR BISHING / POST INSULATOR (SOLID CORE TYPE)

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
02



NOS.OF RISERS
= 2 NOS. PER PHASE



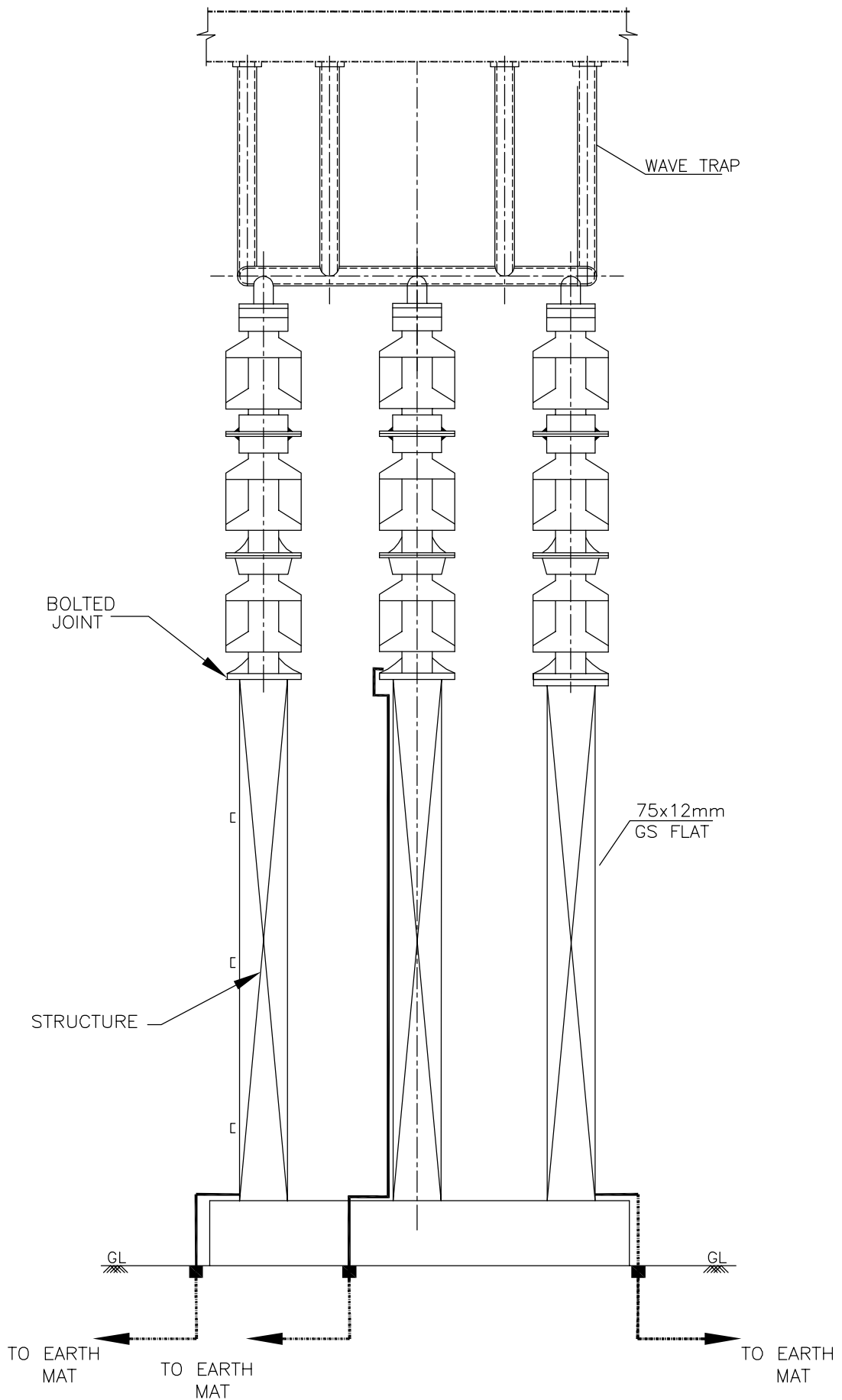
EQUIPMENT EARTHING DETAILS 220kV CAPACITIVE VOLTAGE TRANSFORMER

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
03



RISERS PER 1-PH WT= 3 NOS.



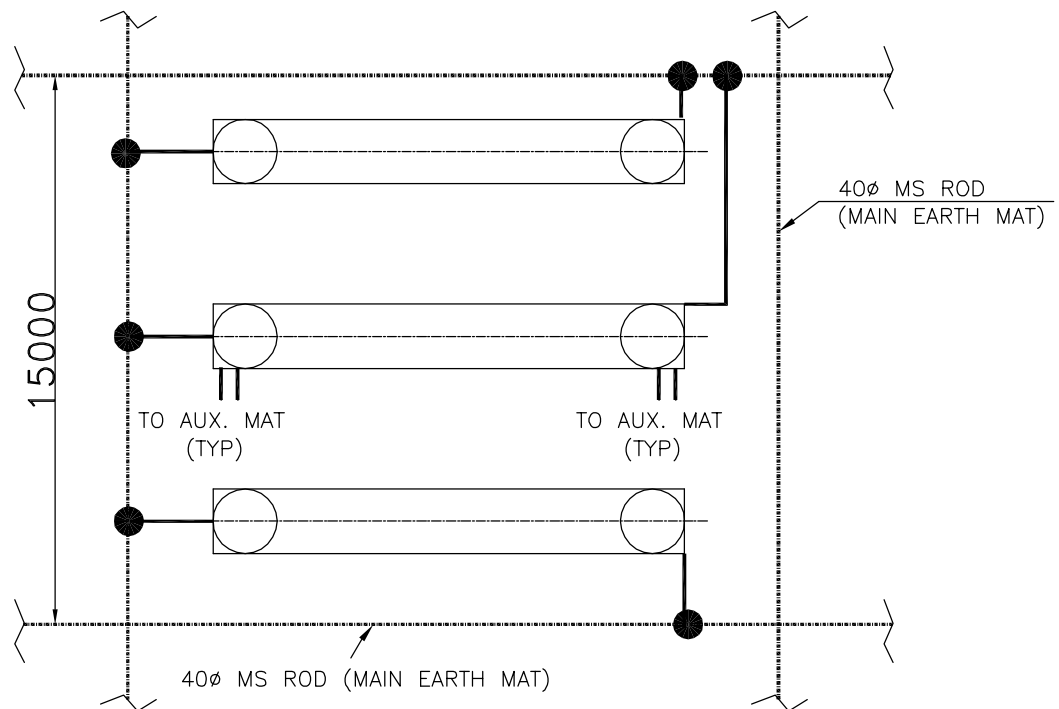
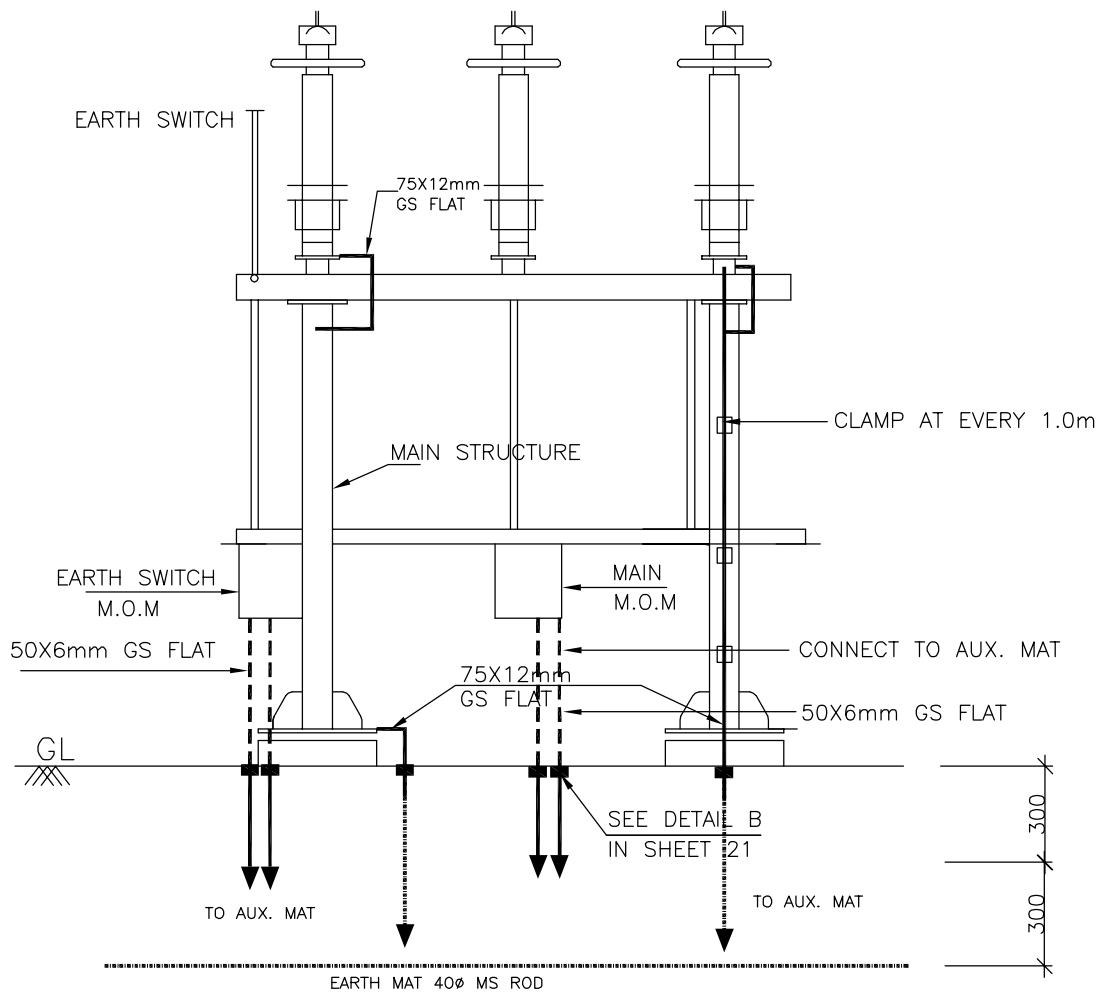
EQUIPMENT EARTHING DETAILS 220kV WAVE TRAP

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
04



NOTES:

1. NO. OF RISER FOR EQUIPMENT = 2 Nos./PHASE
2. NO. OF RISER FOR MECHANISM BOX = 2 Nos./BOX
3. NO. OF AUXILIARY MAT = 1 No./BOX



EQUIPMENT EARTHING DETAILS

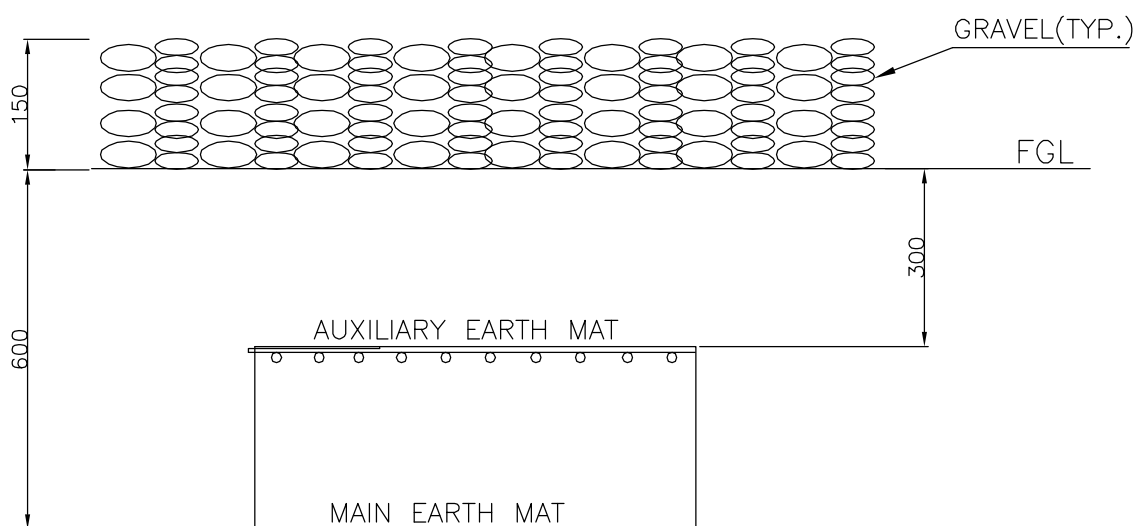
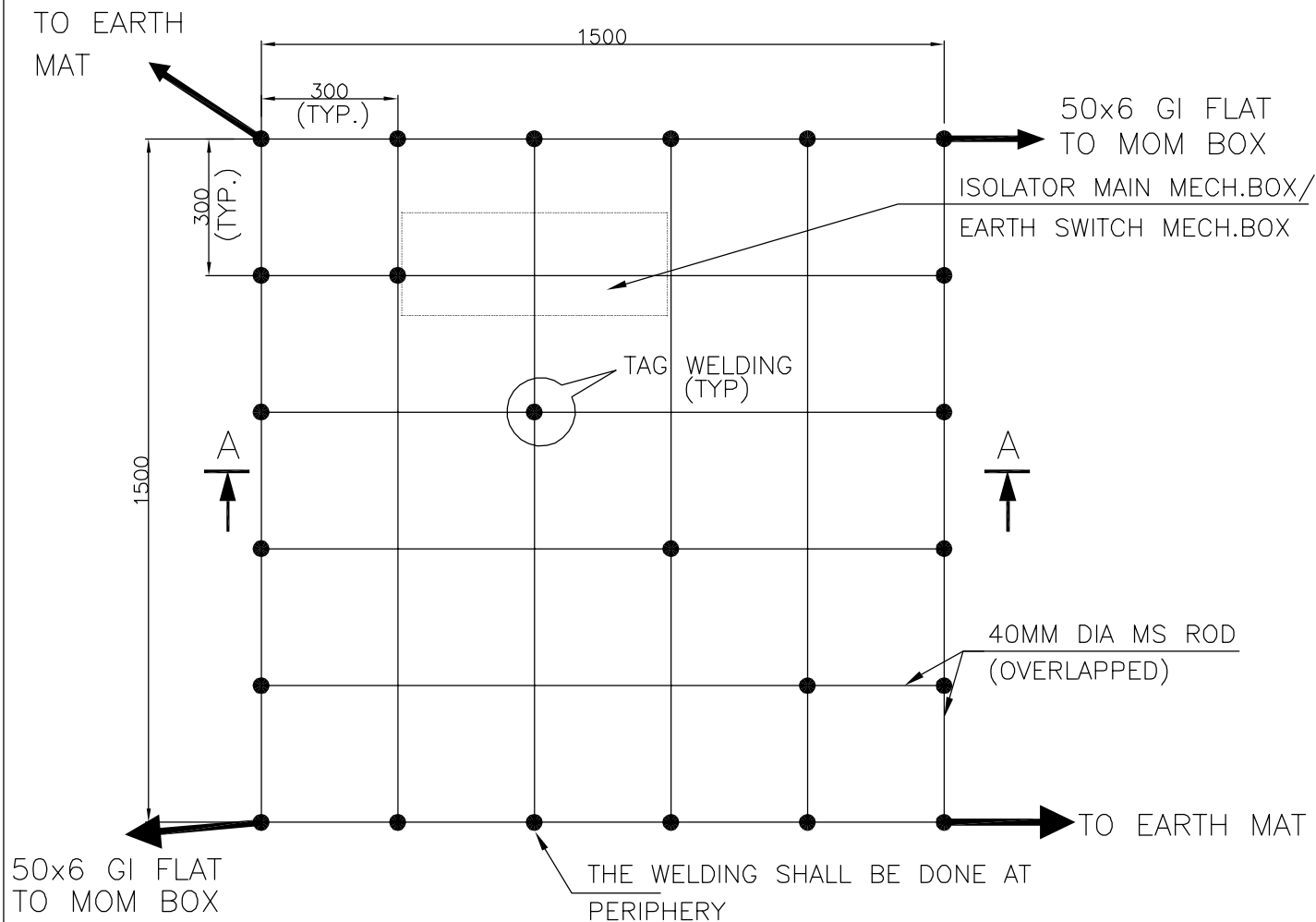
220kV HORIZONTAL DOUBLE BREAK ISOLATOR (TYPICAL) WITH ONE EARTH SWITCH

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
05



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.



EQUIPMENT EARTHING DETAILS

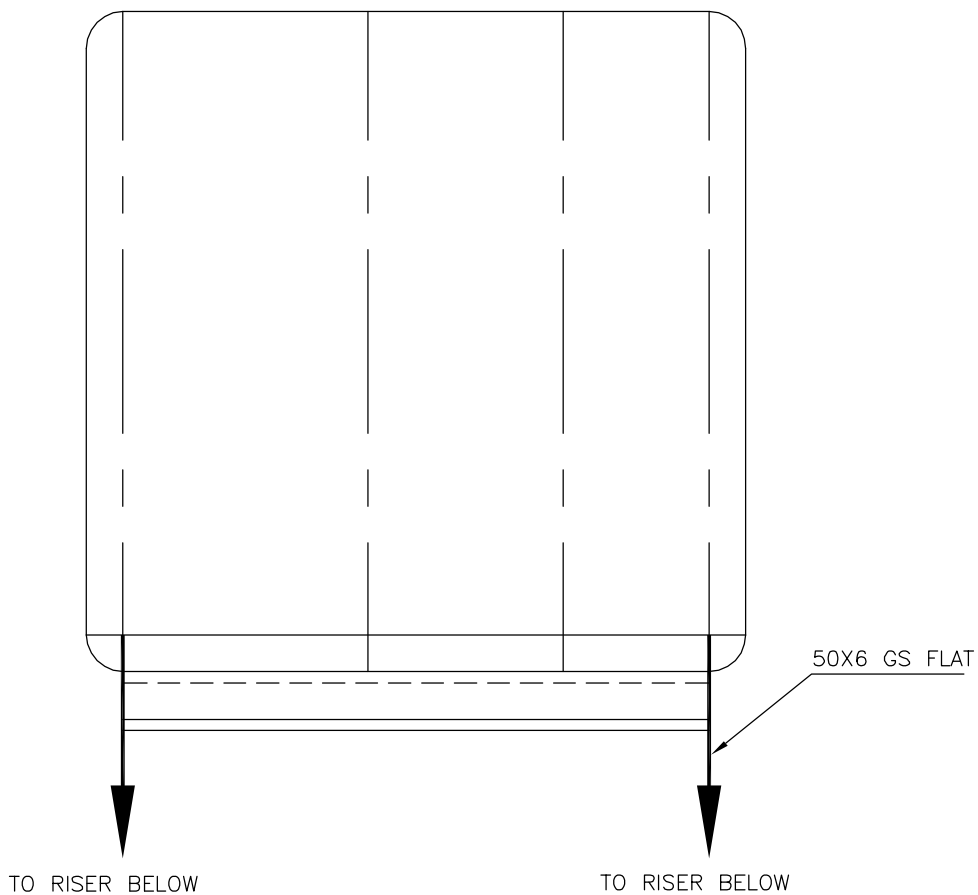
AUXILIARY EARTH MAT FOR ISOLATOR
MAIN MECH., E/S MECH. BOX

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
06



EQUIPMENT CONTROL & RELAY PANELS

NOTE:—

1. THIS EARTHING ARRANGEMENT IS ALSO APPLICABLE FOR SWITCHGEAR; PANELS; CRP/LCC PANELS; AC/DC DISTRIBUTION BOARD; BATTERY CHARGERS / CVTJB.

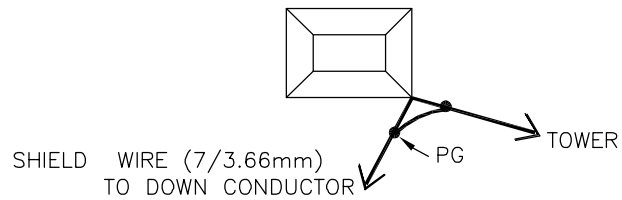


EQUIPMENT EARTHING DETAILS CONTROL AND RELAY PANELS

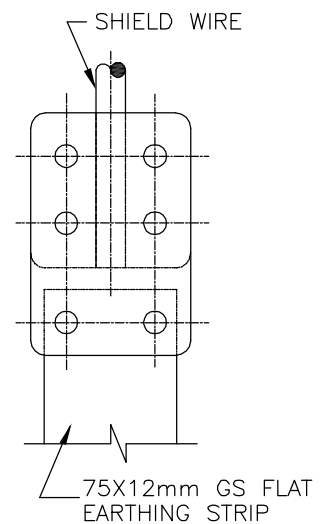
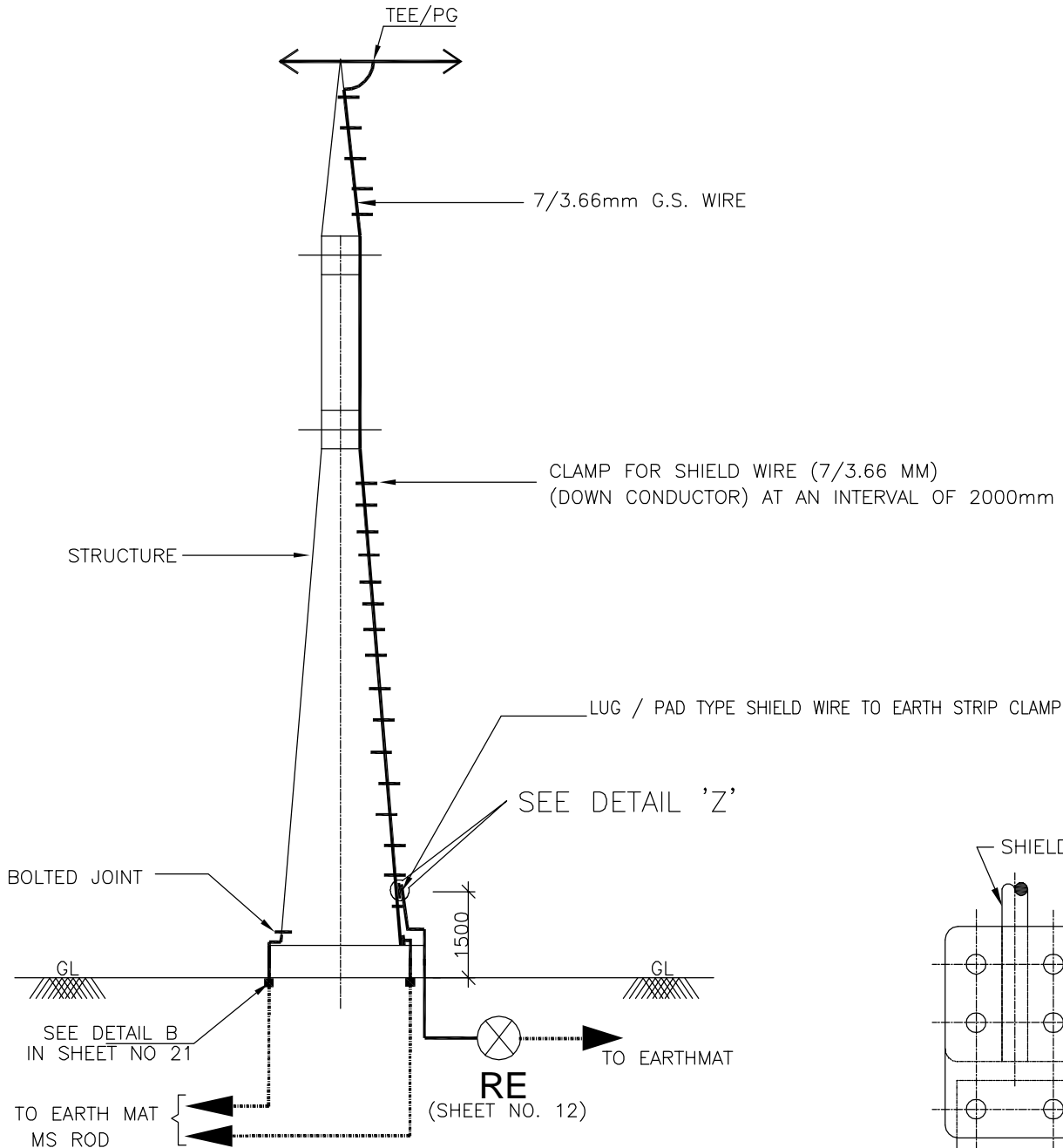
DRG. No.

TB-4-398-316-016

SHEET No.
07



DETAIL WHEN 2 E/WIRE TERMINATES AT TOWER



DETAIL - Z

NOTES:

1. NO. OF RISER FOR TOWER = 2 Nos.
2. NO. OF RISER FOR ROD ELECTRODE = 1No.



EQUIPMENT EARTHING DETAILS

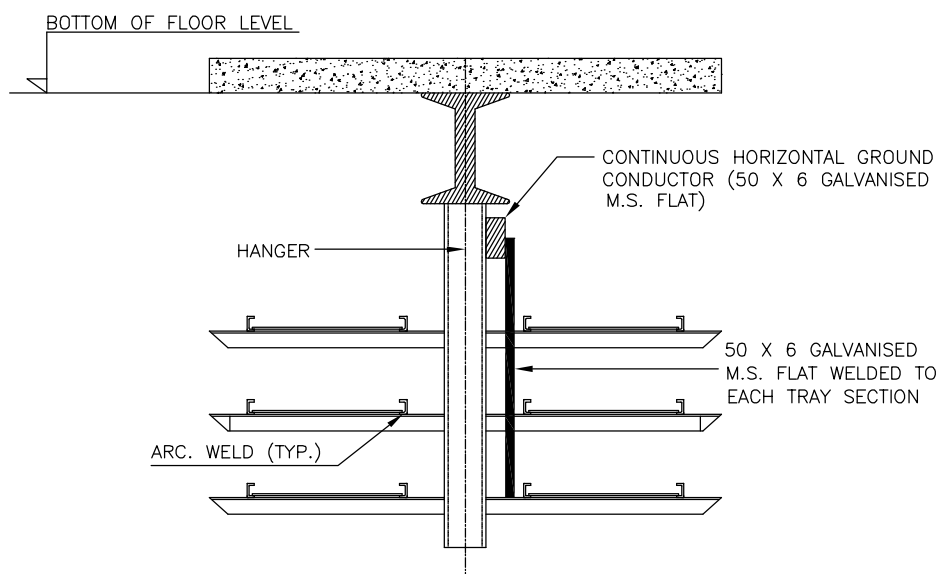
TOWER WITH PEAK

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
08



NOTE:

1. ALL TRENCHES SHALL BE EARTHED AT AN INTERVAL OF 20M ALONG THE LENGTH OF TRENCH & FREE ENDS.
2. THE EARTH STRIP (75X12 G.S. FLAT) SHALL BE WELDED/CLEATED TO TOP RACK ALONG THE TRENCH RUN & CONTROL ROOM AT EVERY 1.5 M.
3. CABLE & CABLE TRAY EARTHING SHALL BE DONE AS PER SPECIFICATION.
5. THE EARTHING CONDUCTOR RUNNING UNDER THE TRENCHES SHALL BE LAID 300MM BELOW THE TRENCHES.



EQUIPMENT EARTHING DETAILS

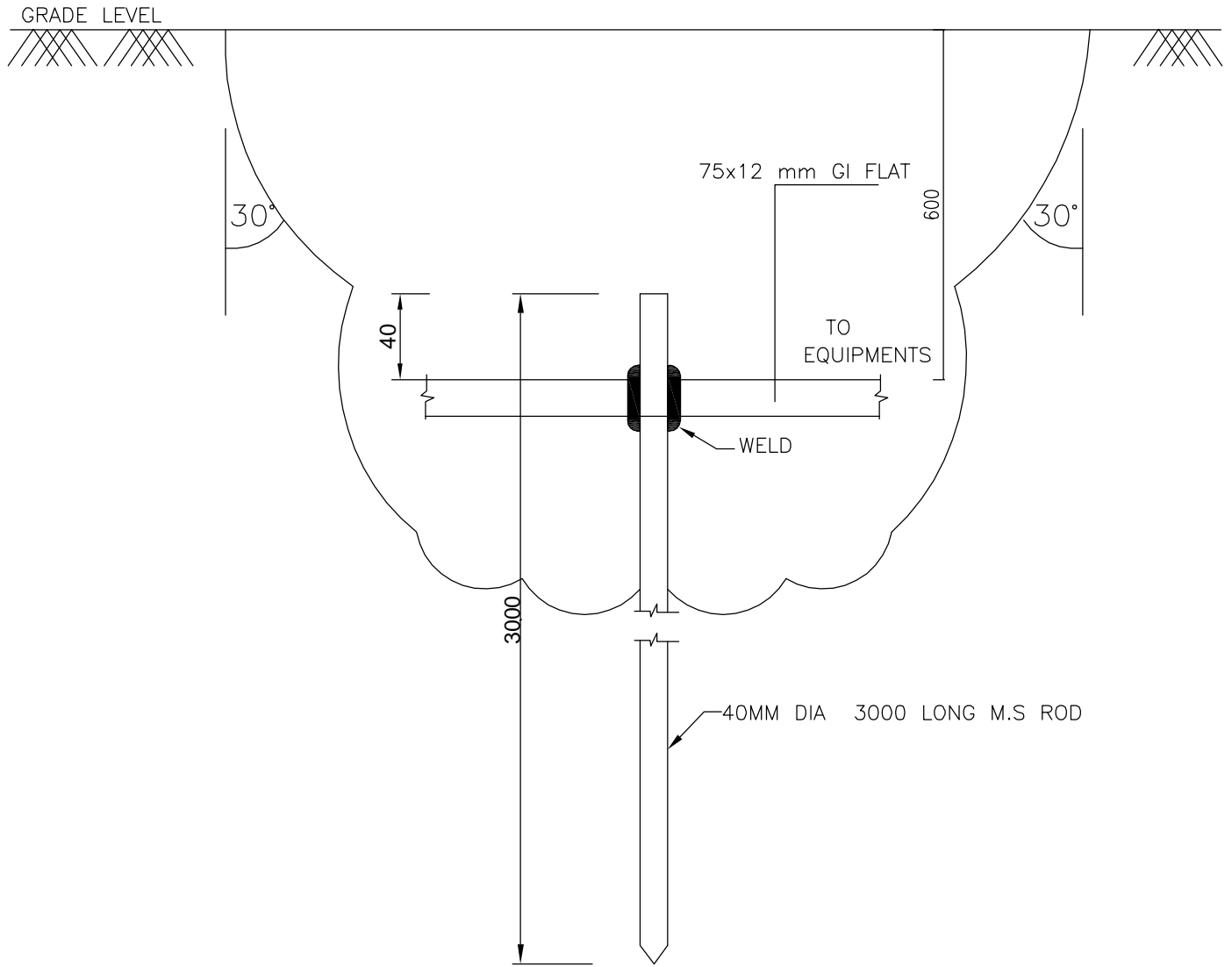
CABLE TRENCH

COMPU. DRG. REF.

DRG. NO.

TB-4-398-316-016

SHEET No.
09



EQUIPMENT EARTHING DETAILS ROD EARTH ELECTRODE WITHOUT TEST PIT

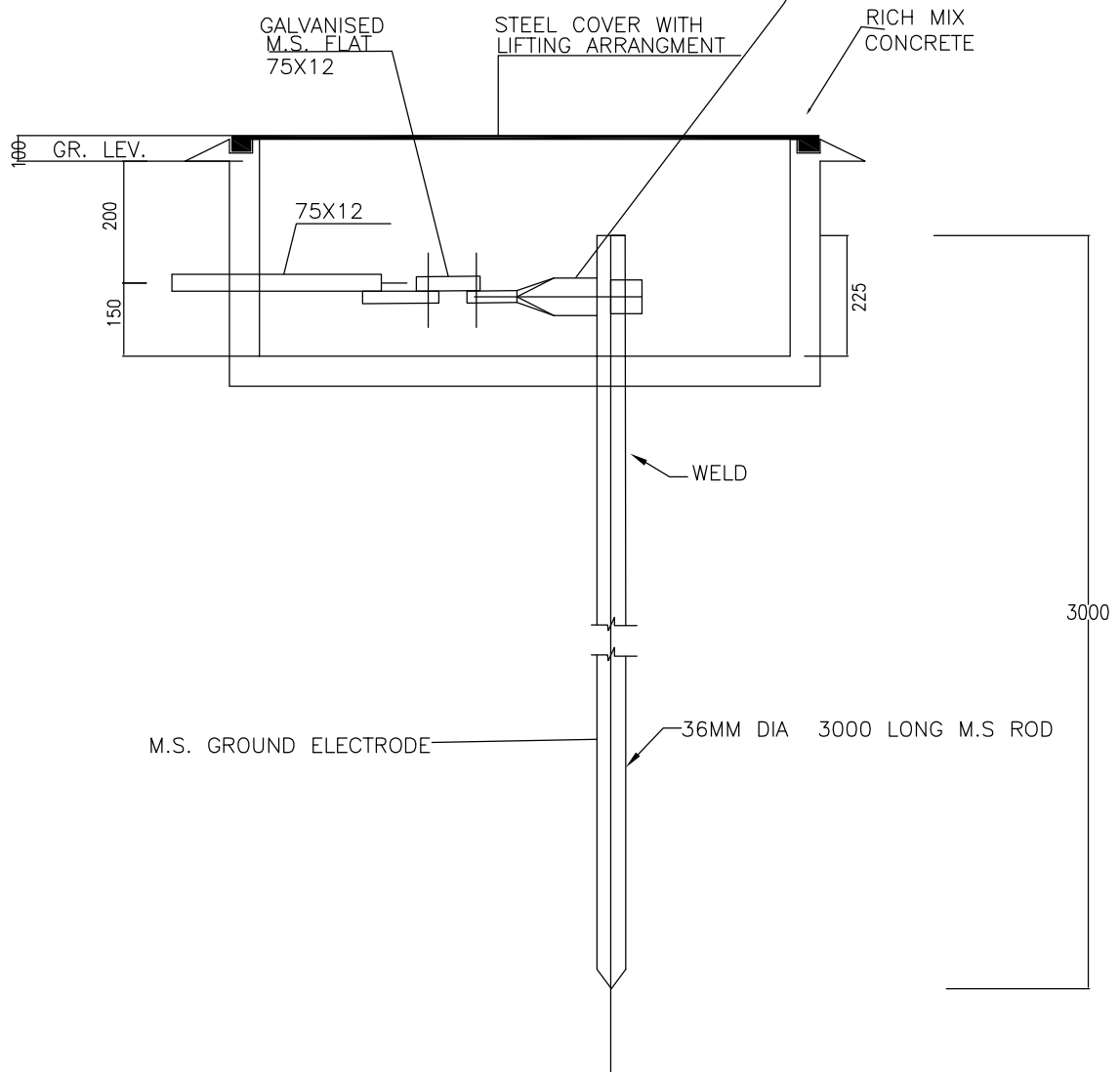
COMPU. DRG. REF.

DRG. NO.

TB-4-398-316-016

SHEET No.
10

GALVANISED M.S. FLAT TWISTED AT 90° BY GAS HEATING AND
WELDED TO ELECTRODE ON AND BOTTOM ALL AROUND BEFORE
ELECTRODE IS DRIVEN INTO THE EARTH



NOTES:—

1. SUPPLY OF FIXING BOLTS NUTS & WASHERS FOR GS FLAT
EARTHING CONDUCTOR IS ALSO PART OF THE SCOPE.
2. WILL BE PROVIDED FOR CONNECTION TO EXISTING EARTHMAT OR
CONNECTION TO TRANSFORMER YARD EARTHMAT



EQUIPMENT EARTHING DETAILS

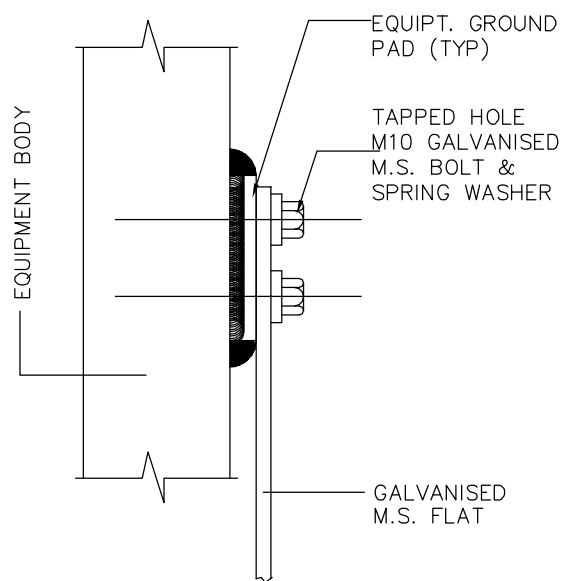
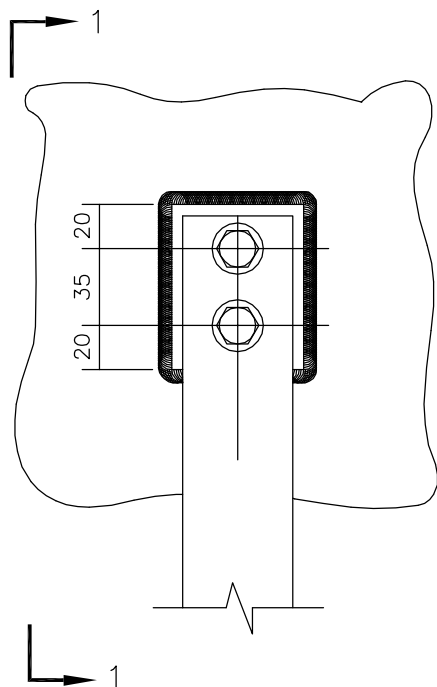
ROD EARTH ELECTRODE WITH TEST PIT

COMPU. DRG. REF.

DRG. NO.

TB-4-398-316-016

SHEET No.
11



SECTION 1-1

EQUIPMENT GROUNDING

NOTE

1. THIS IS GENERAL TYPICAL BOLTING ARRANGEMENT APPLICABLE TO ALL PANELS, EQUIPMENT ETC. WHERE BOLTING ARRANGEMENT IS PROVIDED.



EQUIPMENT & STRUCTURE EARTHING DETAILS

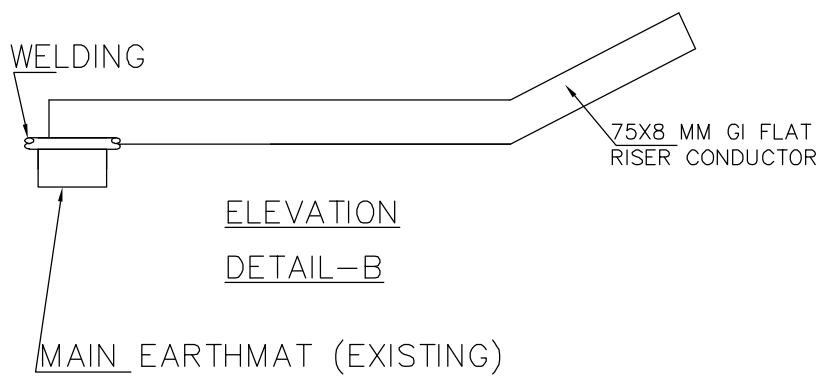
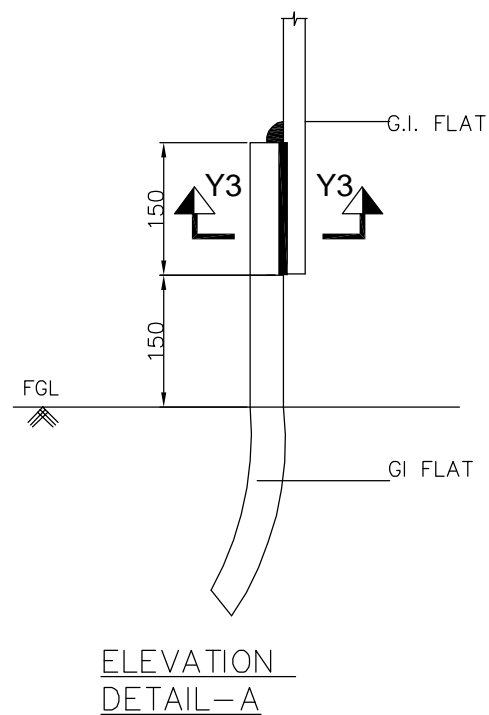
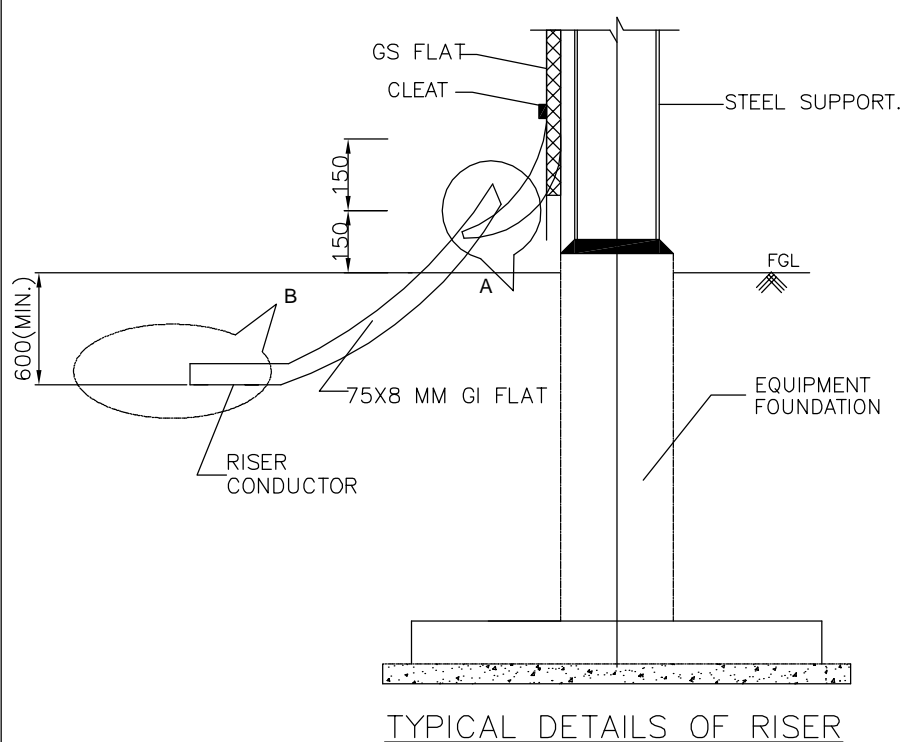
TYPICAL ARRANGEMENT OF BOLTED JOINTS

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
12



EQUIPMENT & STRUCTURE EARTHING DETAILS

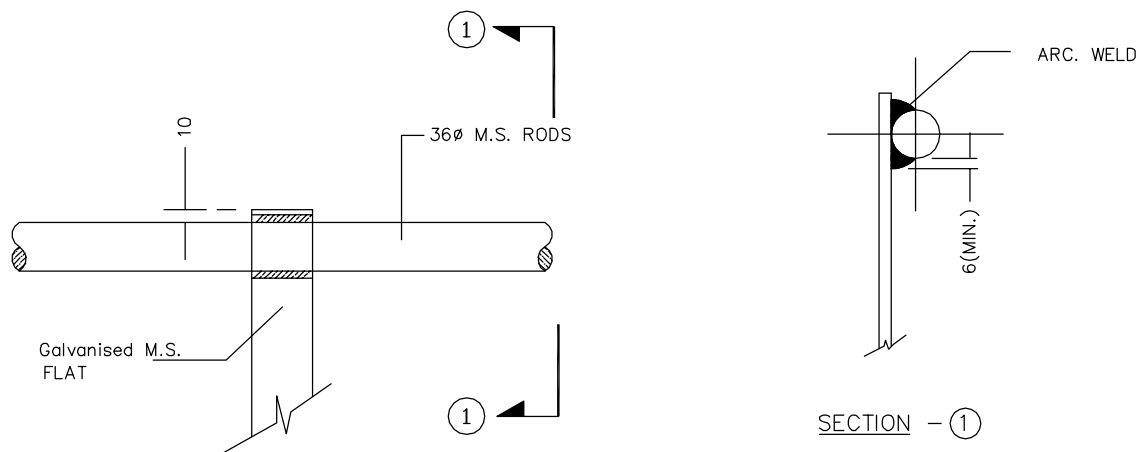
TYPICAL ARRANGEMENT OF RISER

COMPU. DRG. REF.

DRG. No.

TB-4-398-316-016

SHEET No.
13



CROSS JOINT
BETWEEN M.S. ROD & GALVANISED M.S. FLATS



STRIP TO STRIP STRAIGHT LAP JOINT



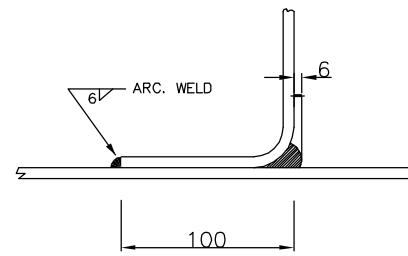
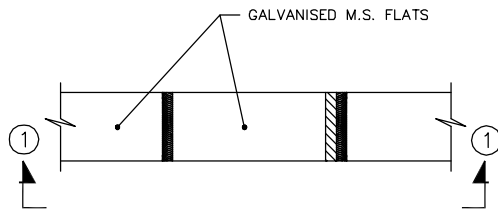
EQUIPMENT & STRUCTURE EARTHING DETAILS
WELDING DETAILS

COMPUTERREF.NO.

DRG. No.

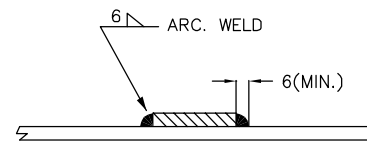
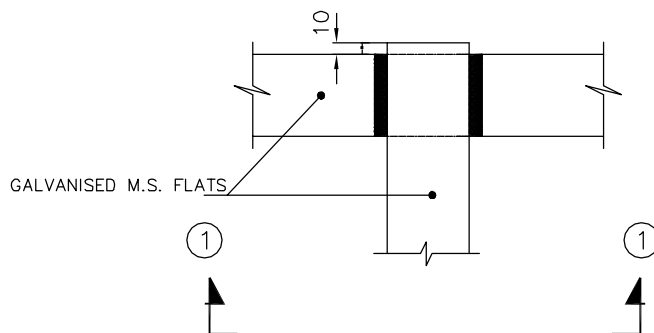
TB-4-398-316-016

SHEET No.
14



SECTION - ①

ANGULAR JOINT
BETWEEN GALVANISED M.S. FLATS



SECTION - ①

CROSS JOINT
BETWEEN GALVANISED M.S. FLATS



EQUIPMENT & STRUCTURE EARTHING DETAILS

WELDING DETAILS

COMPUTERREF.NO.

DRG. No.

TB-4-398-316-016

SHEET No.
15