

GENERAL INSTRUCTION FOR EARTHING:

1. Location of earthing conductors / risers shown in the earthing drawing may change to suit the site condition.
2. Two different risers of one structure/equipment shall be connected to different conductors of main earthmat.
3. Earthing conductor around the building shall be buried at a minimum distance of 1500 mm from the outer boundary of the building.
4. Minimum distance of 6000 mm shall be maintained between two treated (pipe) electrode.
5. For surge arrester, earthing lead from surge counter to to main earthmat shall be shortest in length as practically as possible. Earthing lead from surge arrester shall not be passed through any pipe.
6. No welding is allowed in the over ground earthing leads/risers if the length is less than 6m .
7. All ground connections shall be made by electric arc welding. All welded joints shall be allowed to cool down gradually to atmospheric temperature before putting any load on it. Artificial cooling shall not be allowed.
8. All arc welding with MS ROD shall be done with low hydrogen content electrodes. the welds should be treated with red oxide primer and afterwards coated with two layers bitumen compound to prevent corrosion.
9. Wherever earthing conductor crosses cable trenches, underground service ducts, pipes, tunnels, railway tracks etc., it shall be laid minimum 300 mm below them and shall be circumvented in case it fouls with equipment/structure foundations.
10. Earthing conductor around the building shall be buried in earth at a minimum distance of 1500 mm from the outer boundary of the building.
11. Earthing conductors crossing the road shall be laid 300mm below road or at greater depth to suit the site conditions.
12. Earthing conductors embedded in the concrete shall have approximately 50mm concrete cover

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PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

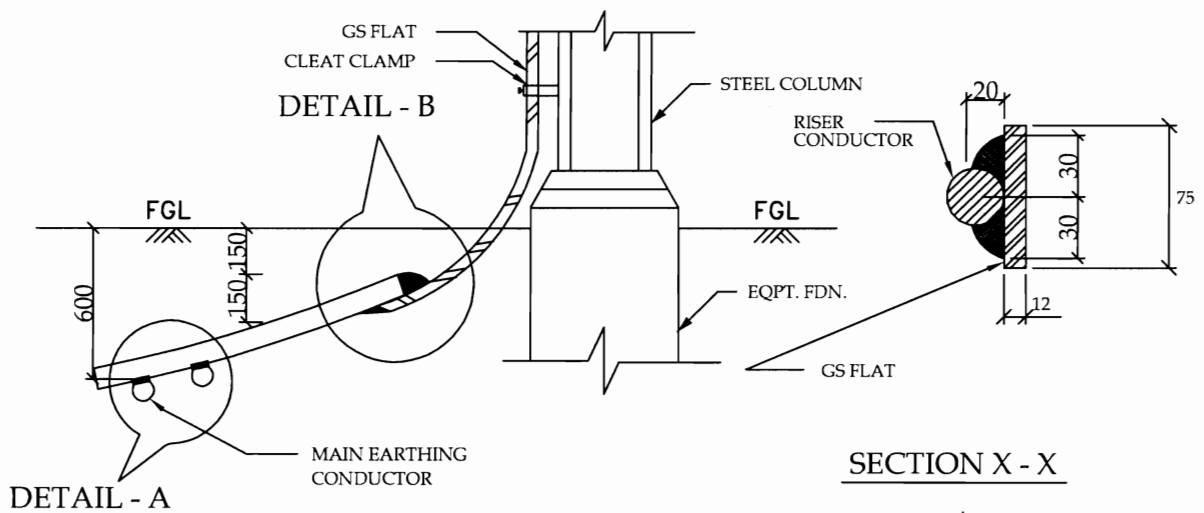
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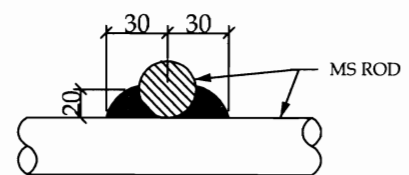
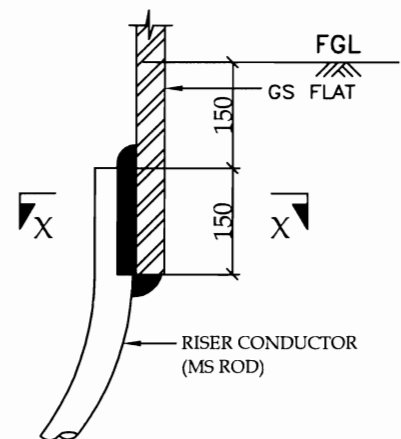
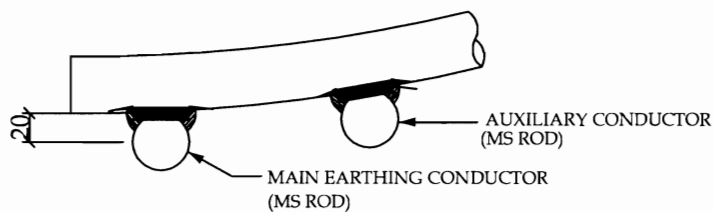
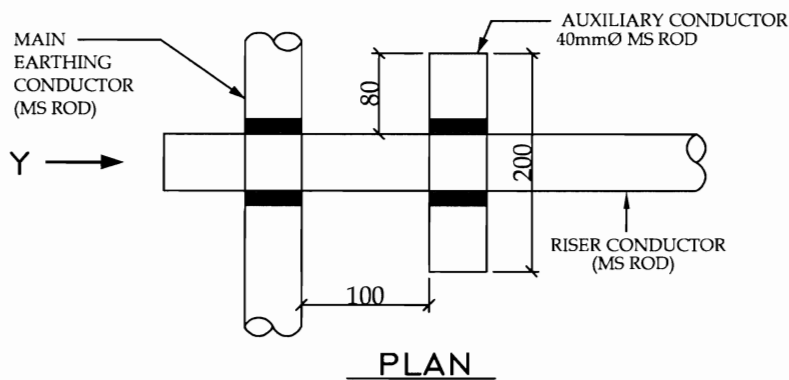
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TYPICAL DETAILS OF RISER



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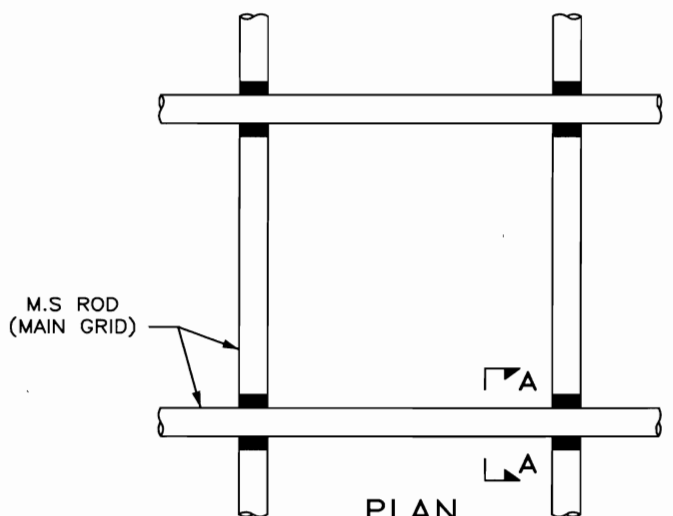
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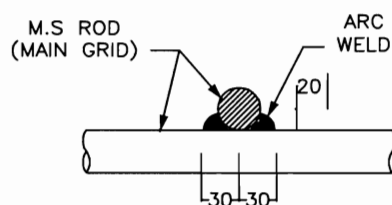
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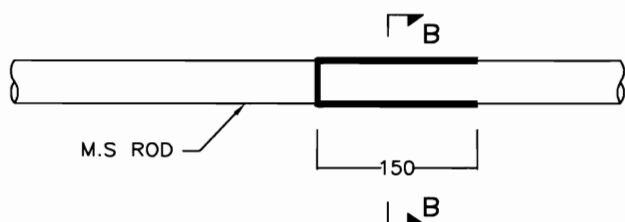
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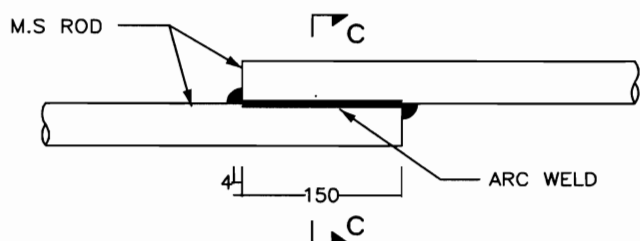
DETAIL OF CROSS JOINT



SECTION A - A

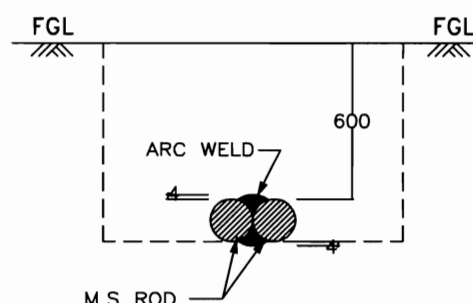


(CONDUCTORS KEPT ON SIDES)

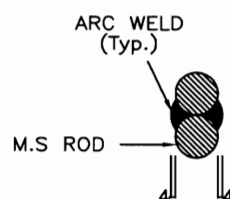


(CONDUCTORS ONE ABOVE THE OTHER)

DETAIL OF LAP JOINT



SECTION B - B



SECTION C - C

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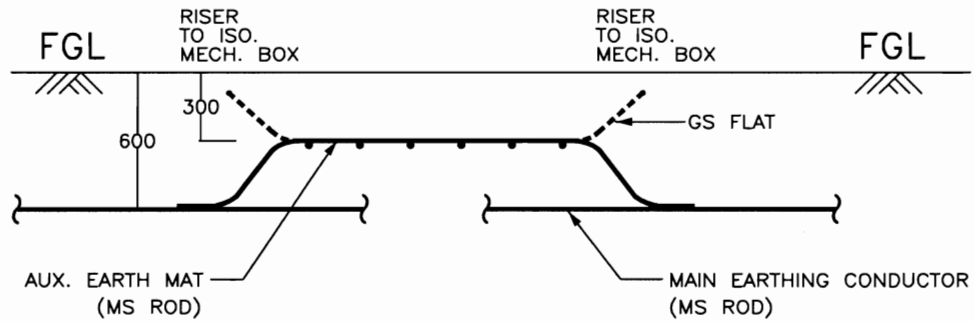
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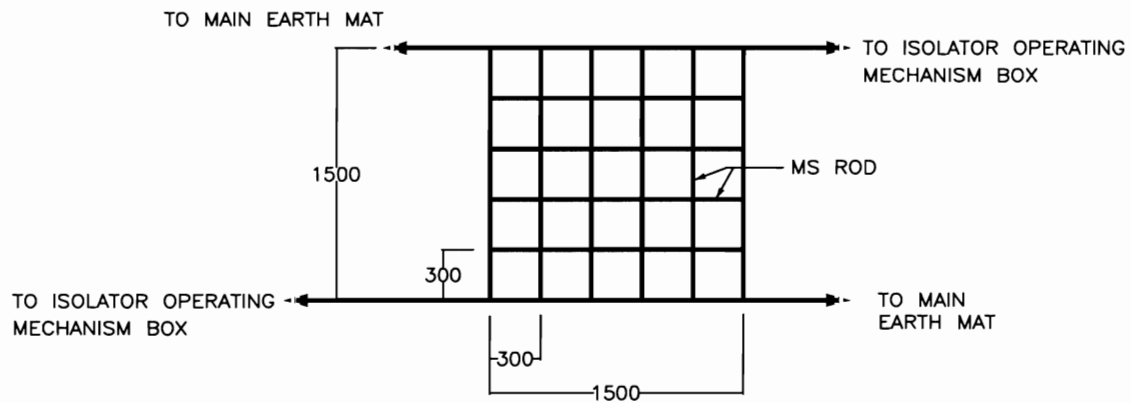
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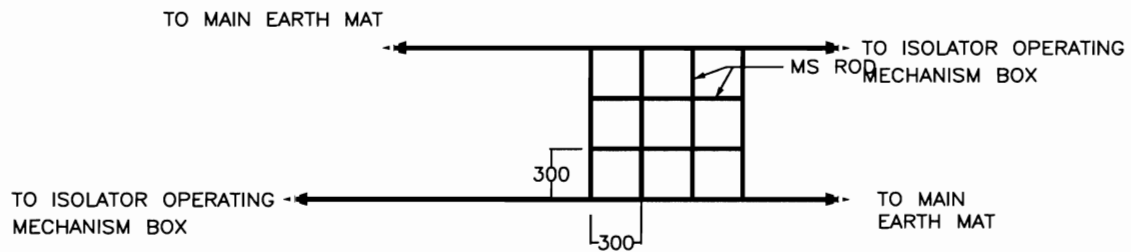
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ELEVATION



PLAN (For 220kV & above class isolators)



PLAN (For 132kV & below class isolators)

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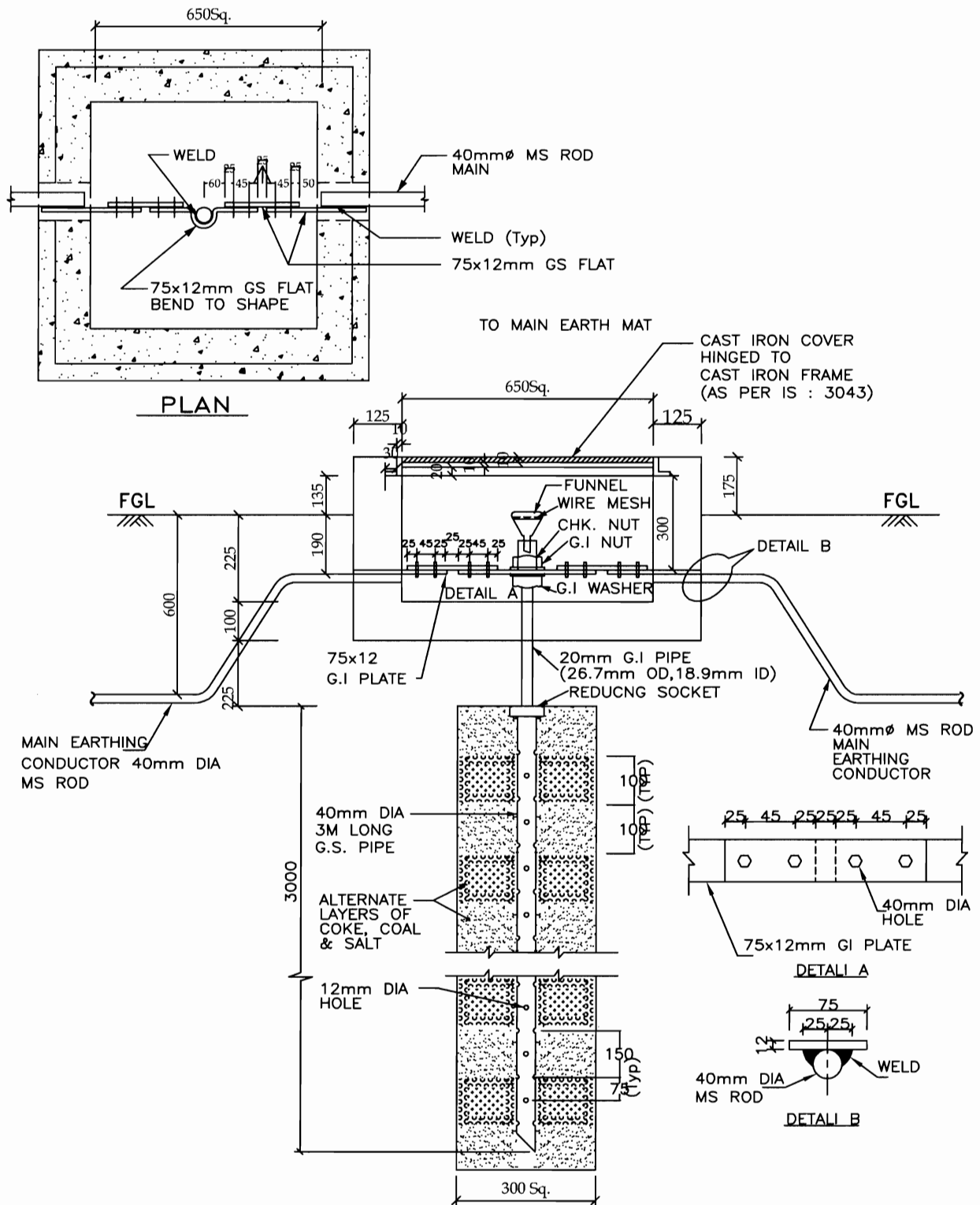
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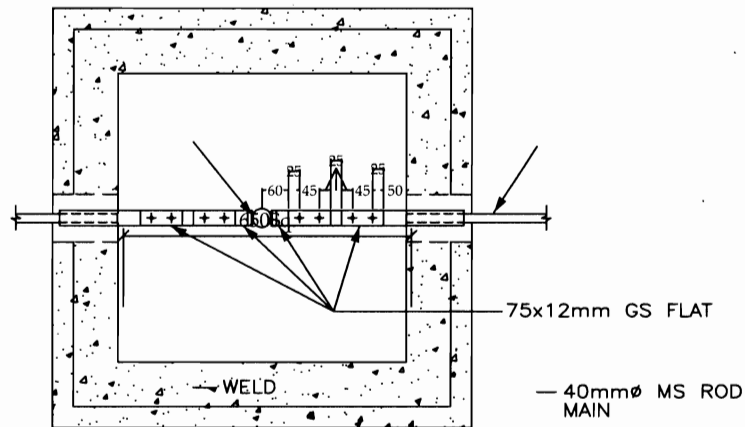


PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

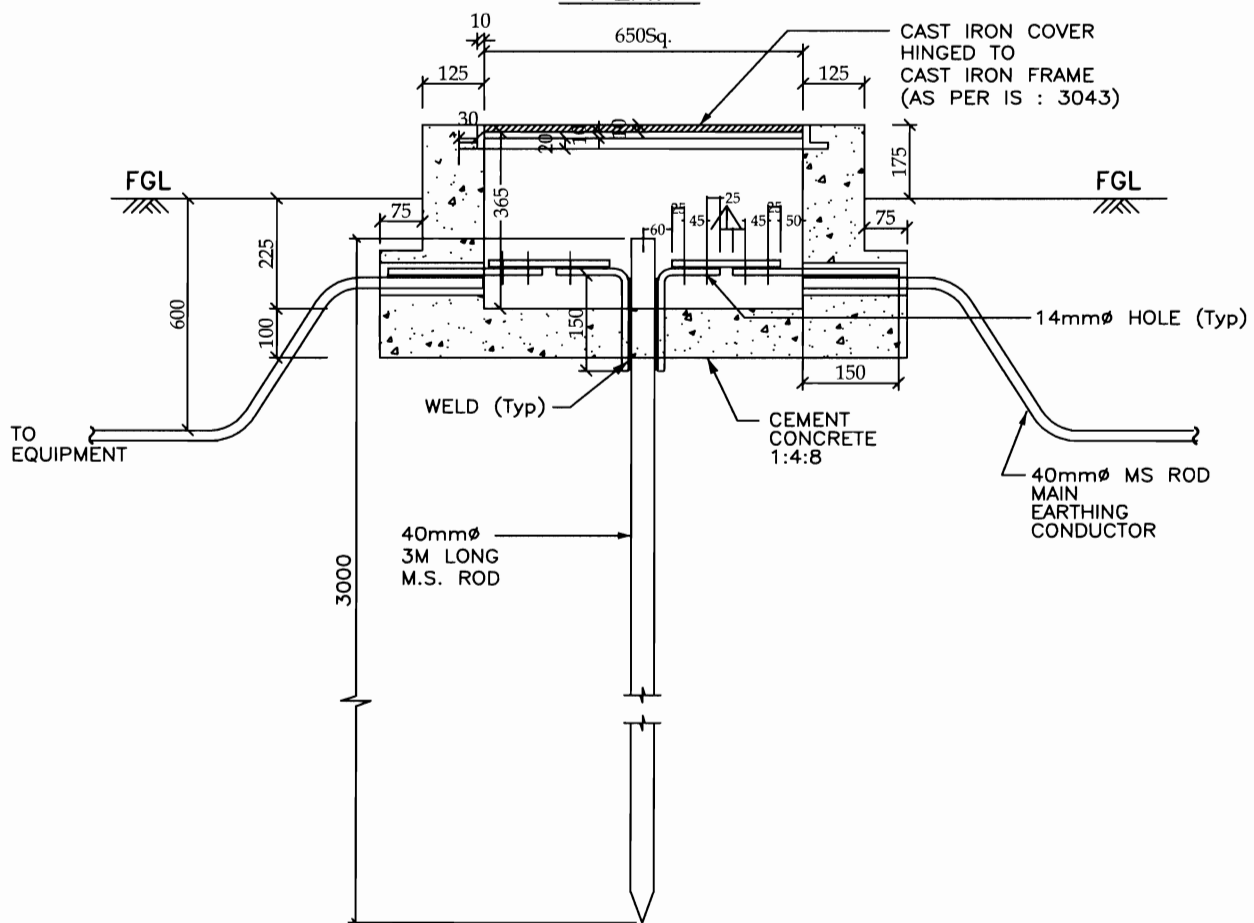
TITLE:- STANDARD EARTHING DETAILS

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ROD ELECTRODE WITH TEST LINK FOR LM, TOWER WITH PEAK, CVT, LA



PLAN



ELEVATION

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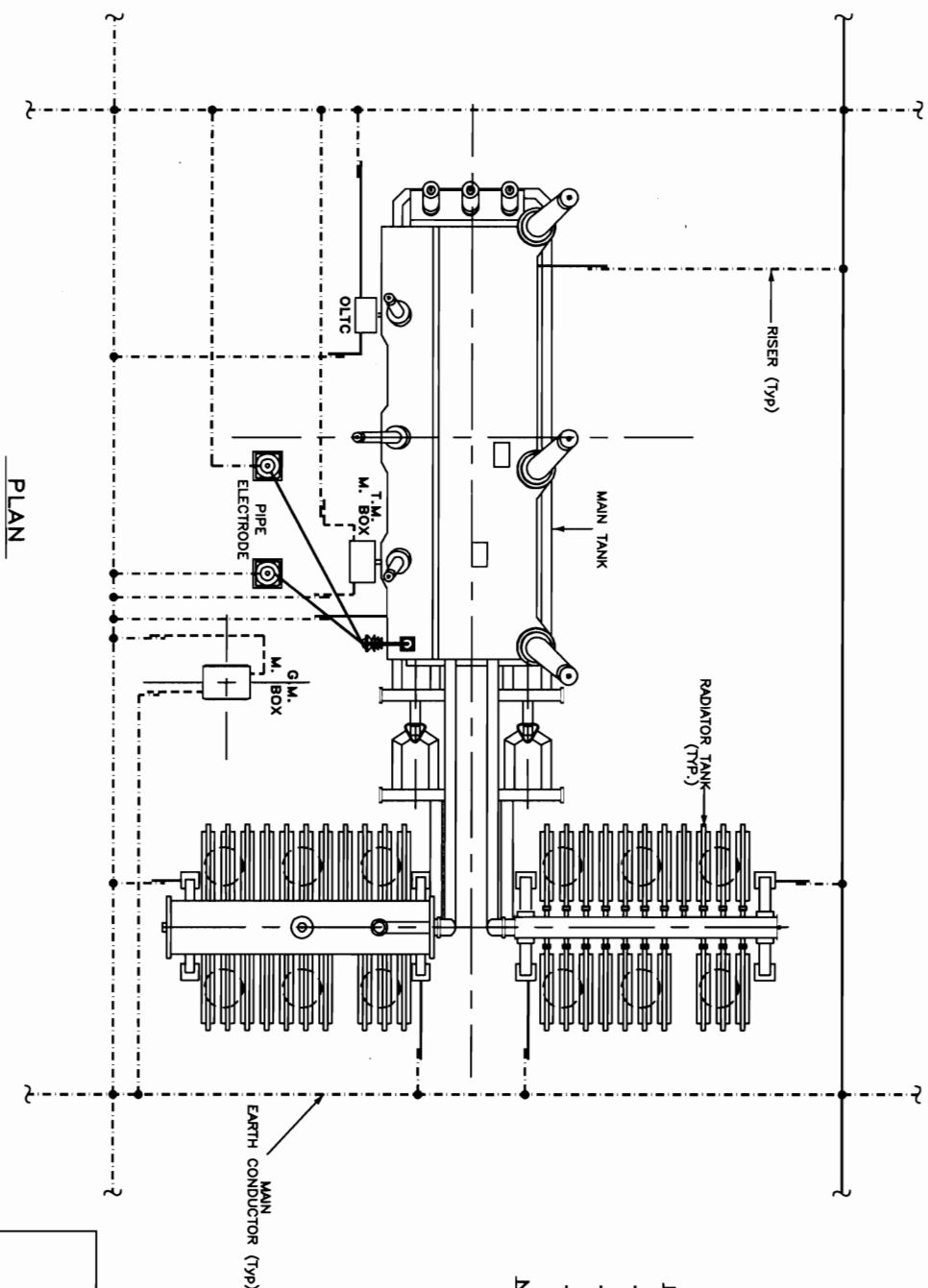


PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF TRANSFORMER/ REACTOR



LEGEND

40mm ϕ MS ROD
75 x 12 mm GS FLAT
50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS :-
 MAIN TANK - 2 Nos.
 RADIATOR TANK - 4 Nos.
 OLTC - 2 Nos. (ICT only)
 M. BOX - 2 Nos./M. BOX
 NEUTRAL EARTH ELECTRODE - 2 Nos.
2. No. OF PIPE ELECTRODE REQUIRED = 2 Nos.
3. PYLON SUPPORTS SHALL BE EARTHED TO THE MAIN EARTHING CONDUCTOR BY GS FLAT.

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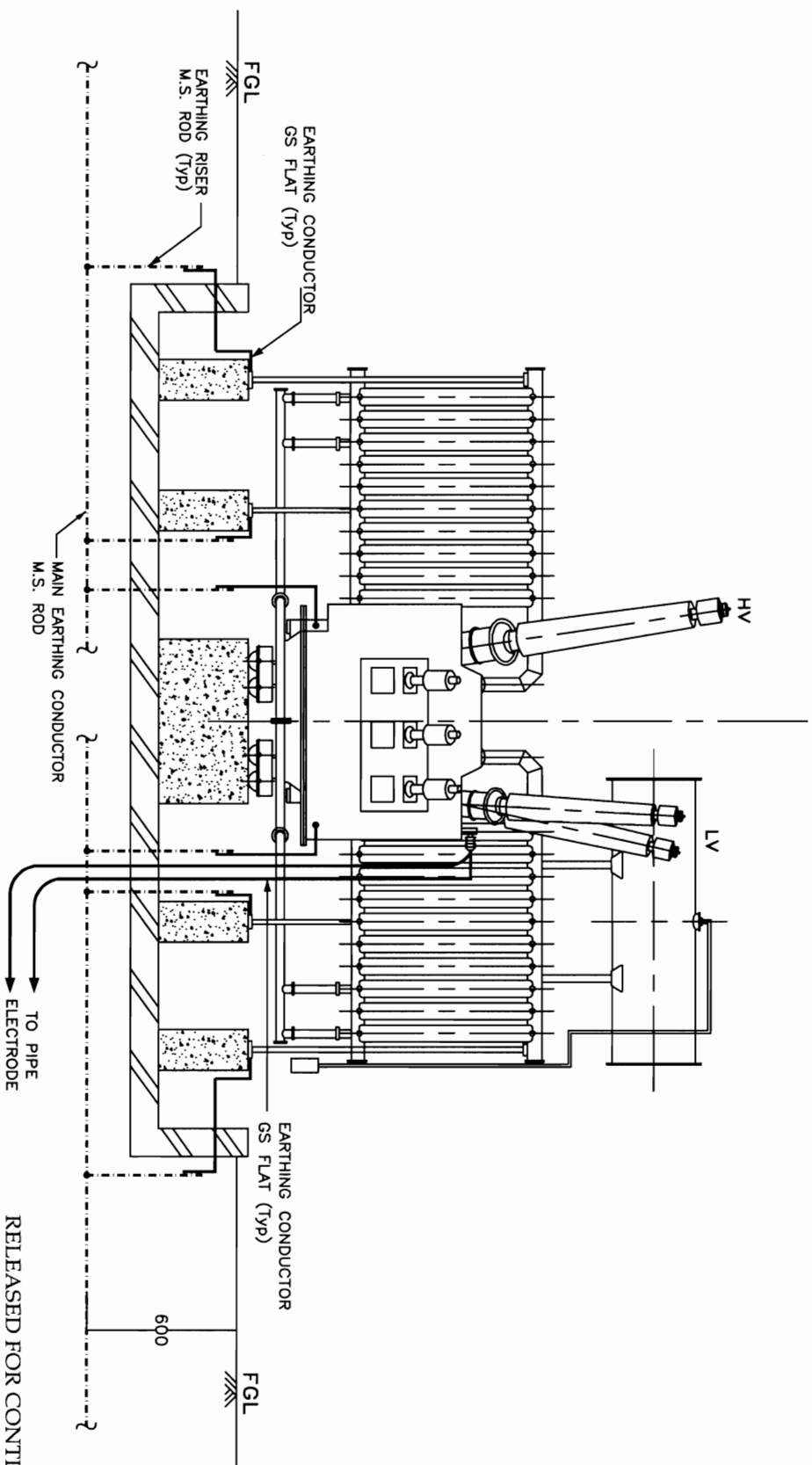


PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

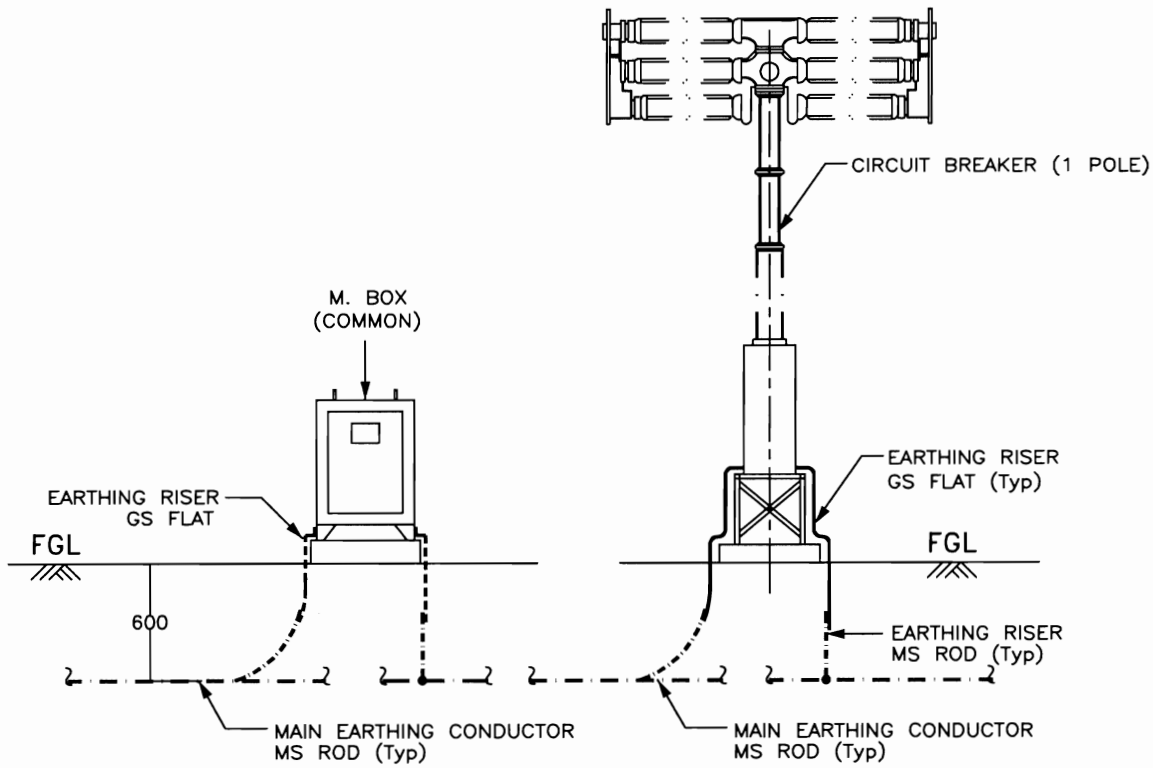
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EARTHING OF TRANSFORMER / REACTOR



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TITLE:- STANDARD EARTHING DETAILS			
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EARTHING OF CIRCUIT BREAKER



ELEVATION

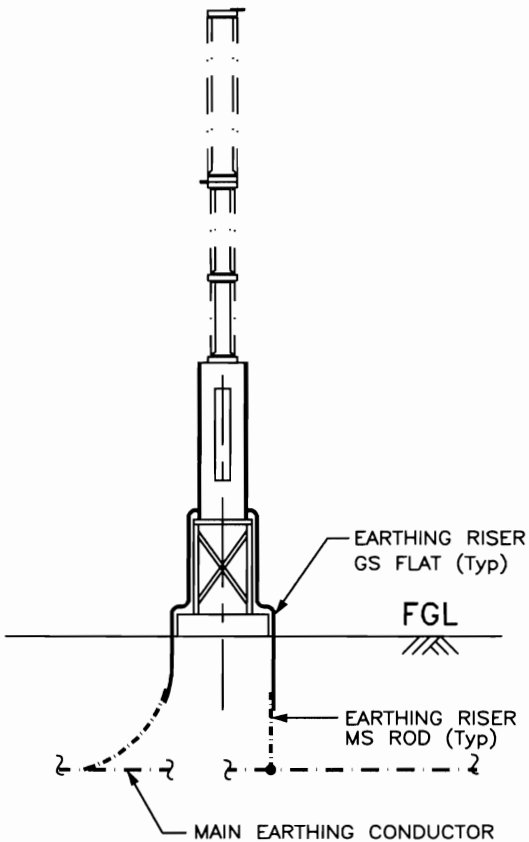
NOTES :-

1. No. OF RISERS FOR CIRCUIT BREAKER = 2 Nos. / PHASE
1. No. OF RISERS FOR LADDER (IF Applicable) = 2 Nos.
2. No. OF RISERS FOR MAR. BOX = 2 Nos.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

LEGEND

— · — · — · —	40mm ϕ MS ROD
—————	75 x 12 mm GS FLAT
-----	50 x 6 mm GS FLAT

RELEASED FOR CONTRUCTION



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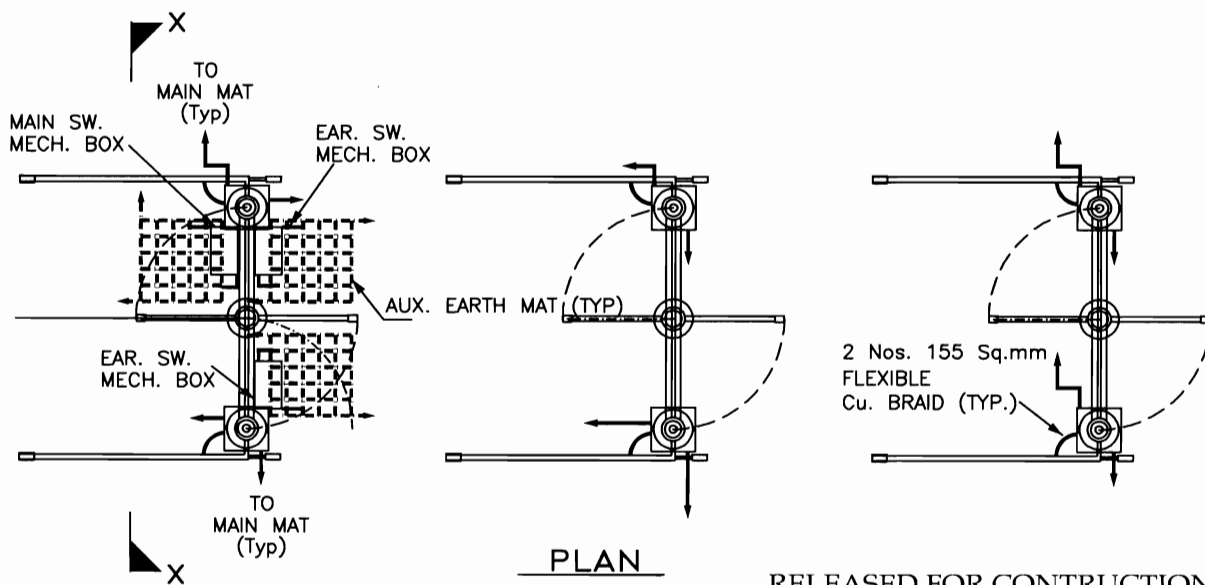
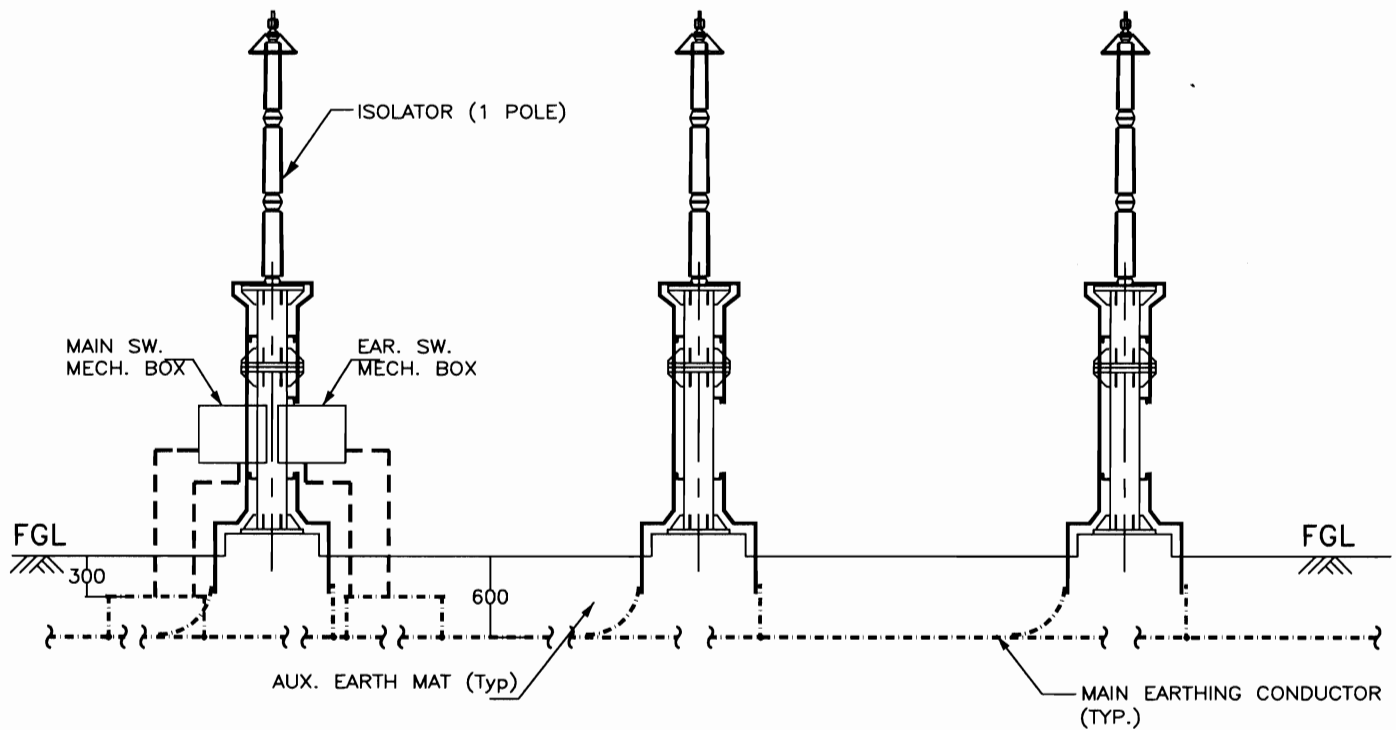
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TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF ISOLATOR



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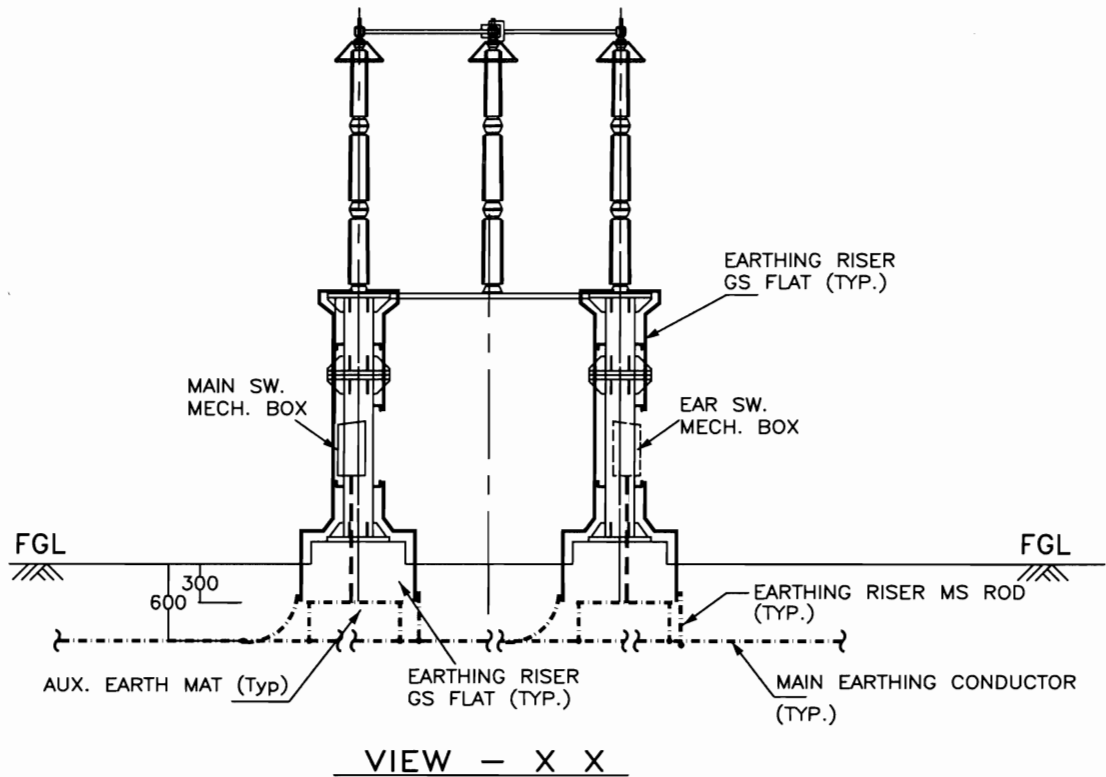


PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF ISOLATOR (1 PH)



LEGEND

— · — · — · —	40mm ϕ MS ROD
—————	75 x 12 mm GS FLAT
-----	50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS FOR ISOLATOR = 4 Nos. / PHASE.
2. No. OF RISERS FOR MAIN MECH. BOX = 2 Nos.
3. No. OF RISERS FOR EARTH SW. MECH. BOX = 2 Nos. / BOX.
4. No. OF AUXILIARY EARTH MAT = 1 Nos. FOR EACH MB
5. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.
6. NO. OF AUX. EARTH MAT IS INDICATIVE ONLY. IT SHALL BE EXECUTED AS PER ACTUAL NUMBER/POSITION OF EARTH SWITCHES.

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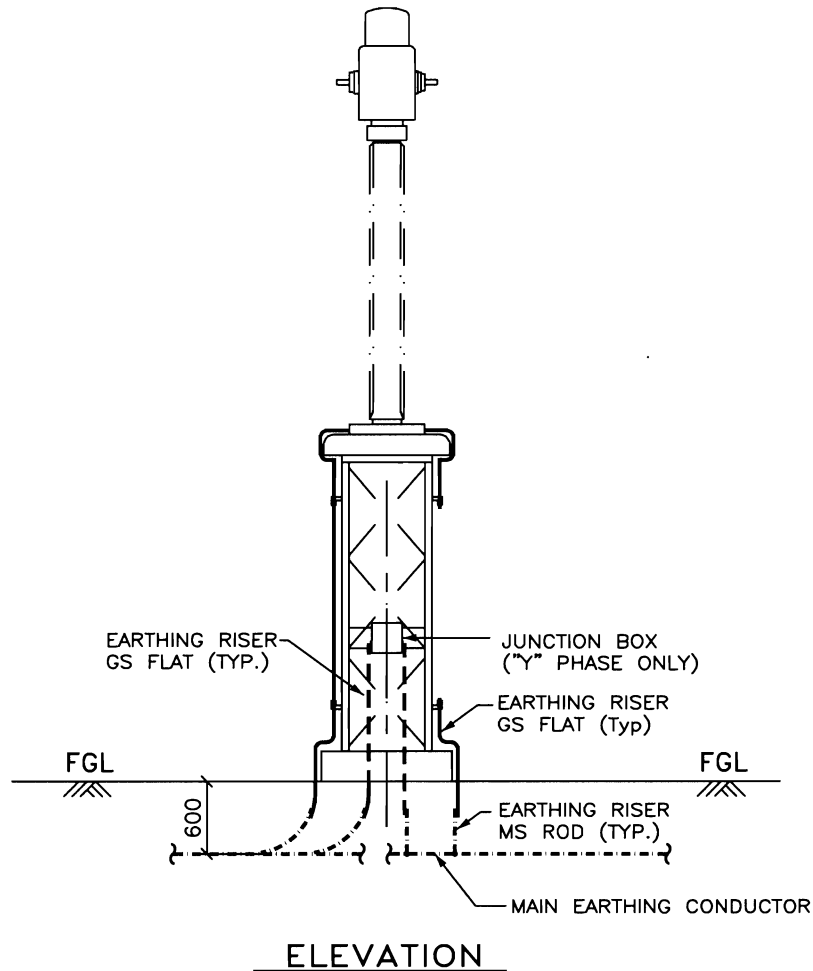


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TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF CURRENT TRANSFORMER (1 PH)



LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS = 2 Nos. / PHASE.
2. No. OF RISERS FOR JUN. BOX = 2 Nos.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

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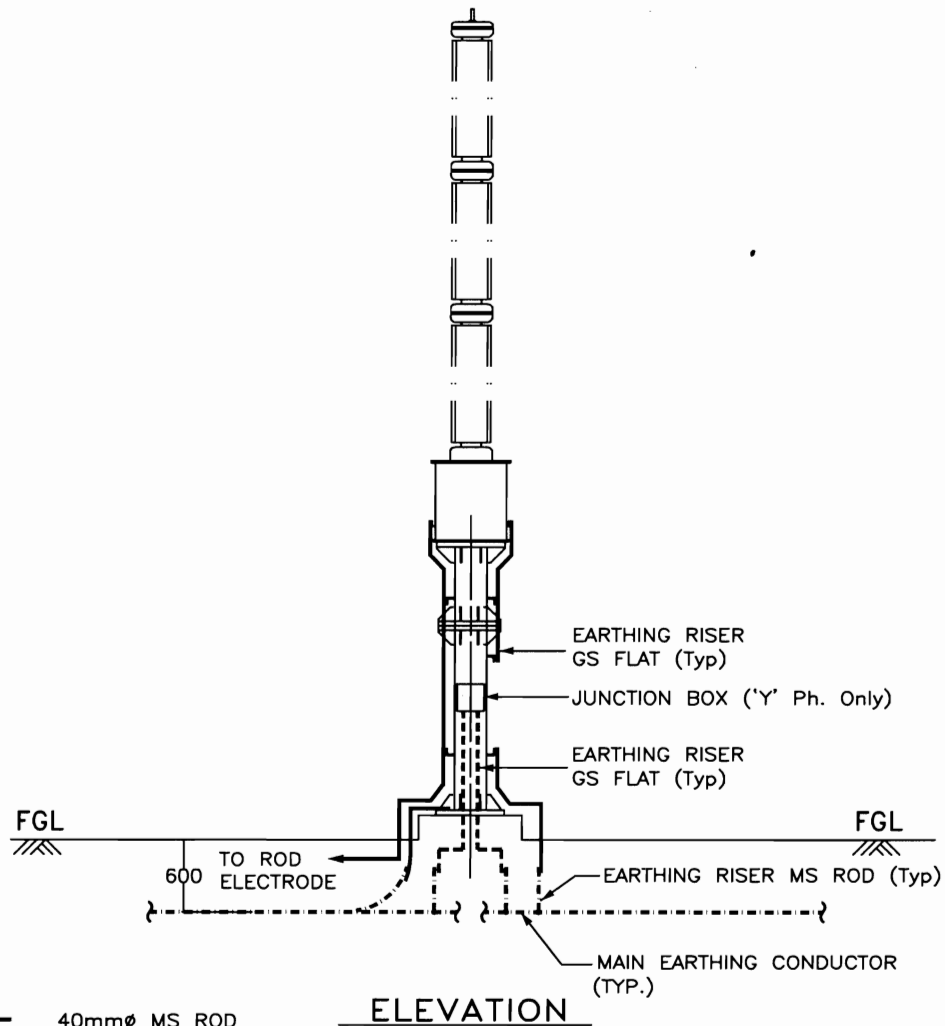


**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

<i>K.K. Pathak</i>	<i>K.K. Pathak</i>	Dec-2013	Drawing No.:
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EARTHING OF CAPACITIVE VOLTAGE TRANSFORMER (1 PH)



LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS = 3 Nos. / PHASE.
2. No. OF RISERS FOR J. BOX = 2 Nos.
3. No. OF ROD ELECTRODE REQUIRED = 1 No. / PHASE.
4. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

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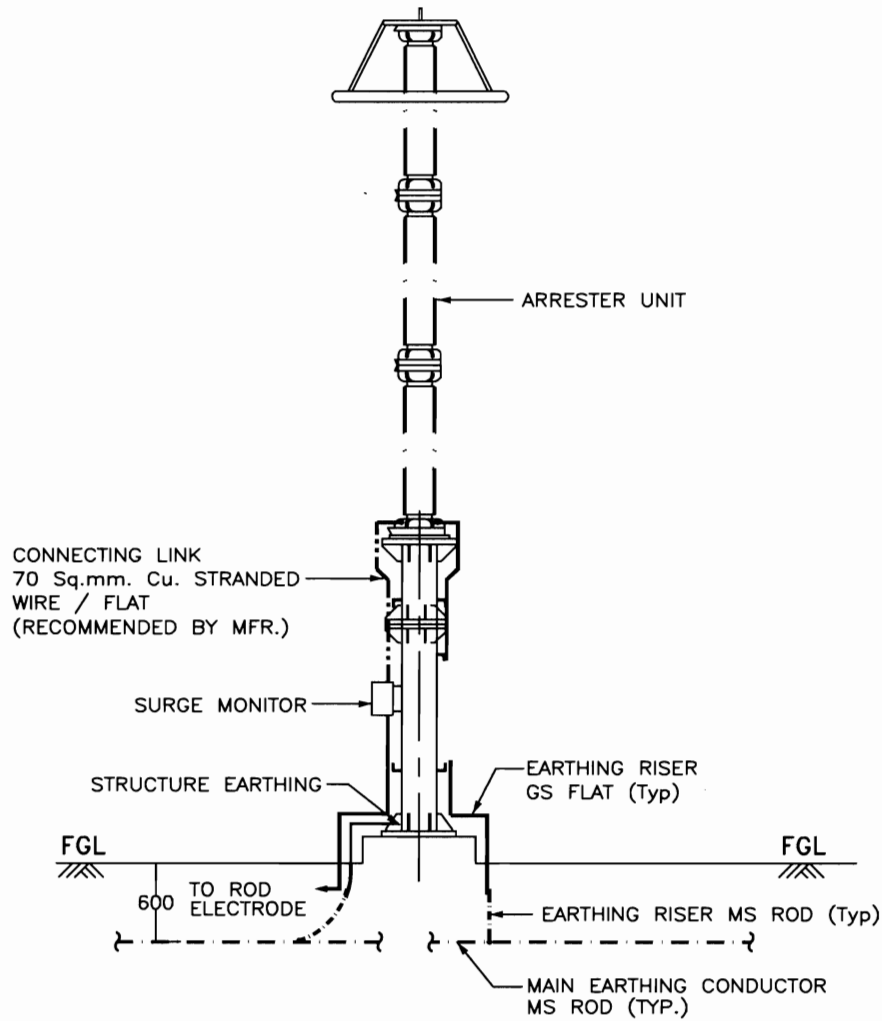


**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

<i>K.K. Pathak</i>	<i>K.K. Pathak</i>	Dec-2013	Drawing No.:
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EARTHING OF SURGE ARRESTER (1PH)



ELEVATION

LEGEND

- 40mm ϕ MS ROD
- 75 x 12 mm GS FLAT

NOTES :-

- 1 . No. OF RISERS = 3 Nos. / PHASE.
- 2 . No. OF ROD ELECTRODE REQUIRED = 1 No. / PHASE.
- 3 . CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

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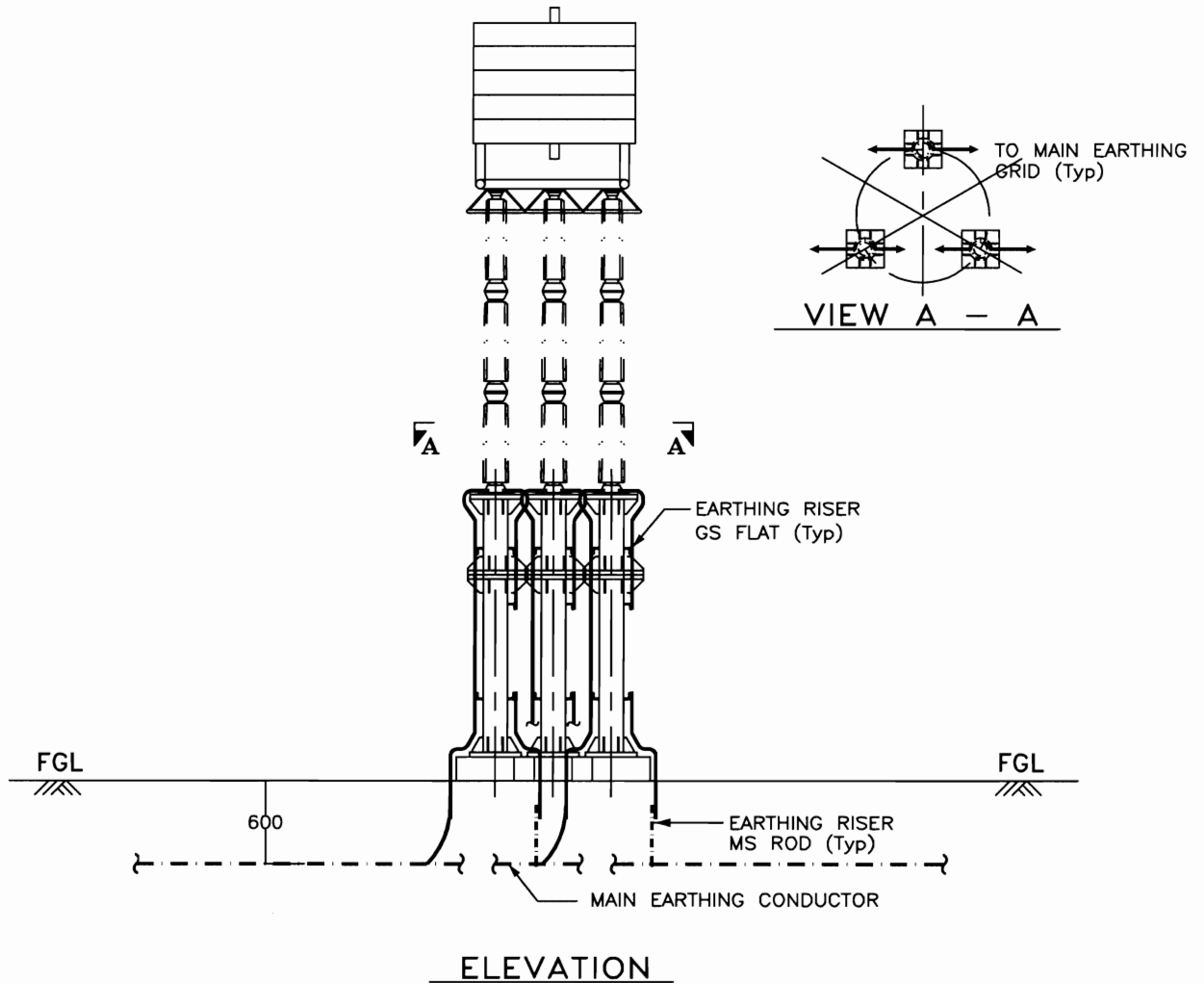


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TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF WAVE TRAP (1PH)



LEGEND

- 40mm ϕ MS ROD
 75 x 12 mm GS FLAT

NOTE :-

1. No. OF RISERS = 6 Nos. / PHASE.
2. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

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TITLE:- STANDARD EARTHING DETAILS

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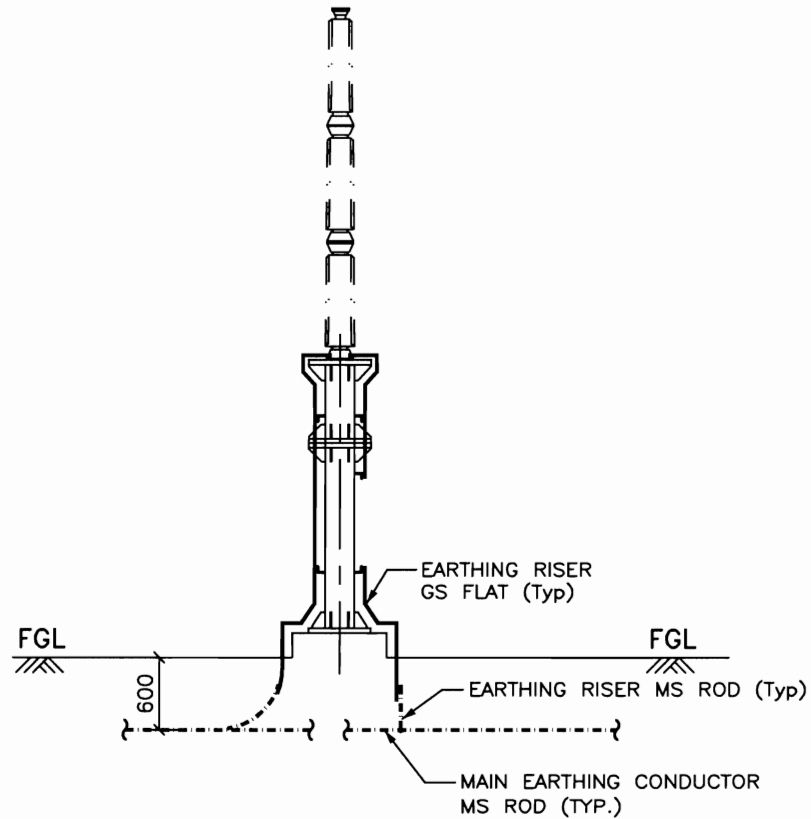
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EARTHING OF POST INSULATOR (1PH)



ELEVATION

LEGEND

- · — · — · — 40mm ϕ MS ROD
————— 75 x 12 mm GS FLAT

NOTES :-

1. No. OF RISERS = 2 Nos. / PHASE.
2. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

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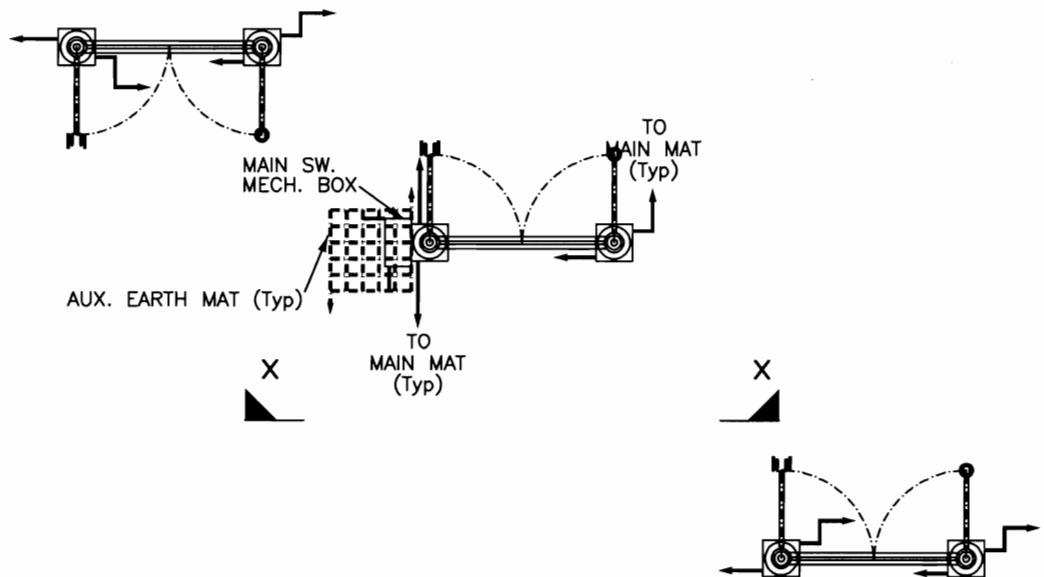
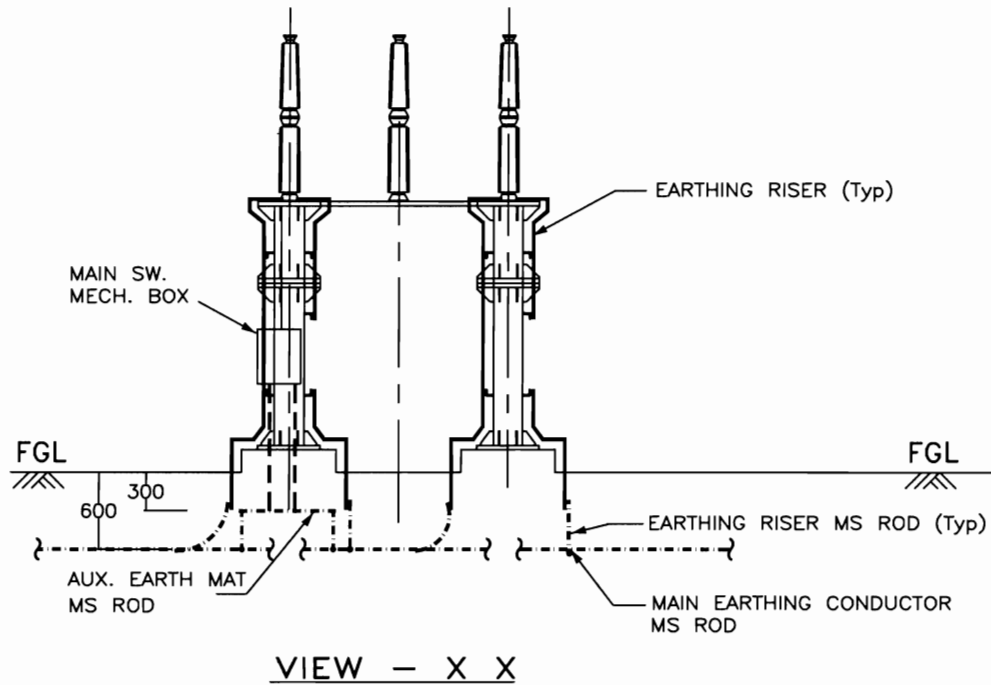


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SWITCHYARD ERECTION

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TANDEM ISOLATOR



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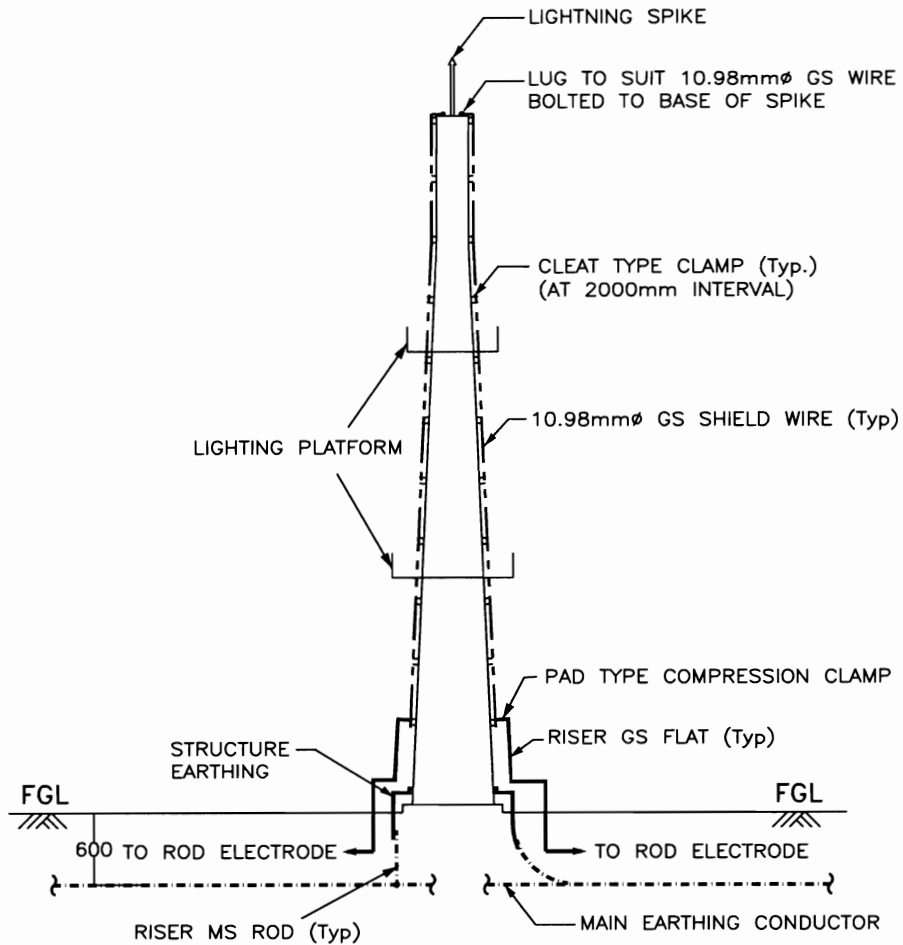
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Date

EARTHING OF LIGHTNING MAST



ELEVATION

NOTES :-

1. No. OF RISERS = 4 Nos.
2. No. OF ROD ELECTRODE REQUIRED = 2 Nos.
3. No. OF PAD TYPE CLAMP = 2 Nos.

LEGEND

- 40mmØ MS ROD
 75 x 12 mm GS FLAT

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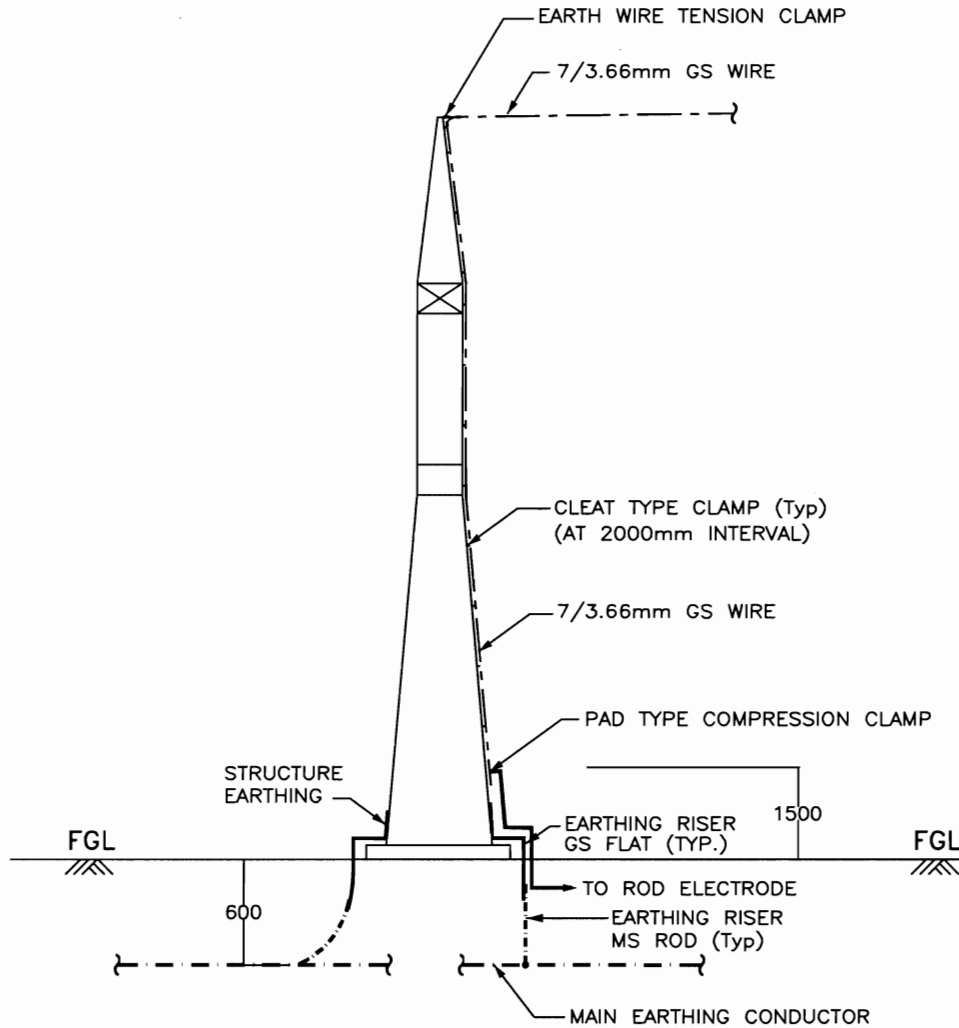


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EARTHING OF TOWER WITH PEAK



ELEVATION

NOTES :-

1. No. OF RISERS = 3 Nos.
2. No. OF ROD ELECTRODE REQUIRED = 1 No.
3. No. OF PAD TYPE CLAMP = 1 No.

LEGEND

- · — · — 40mm ϕ MS ROD
 ————— 75 x 12 mm GS FLAT

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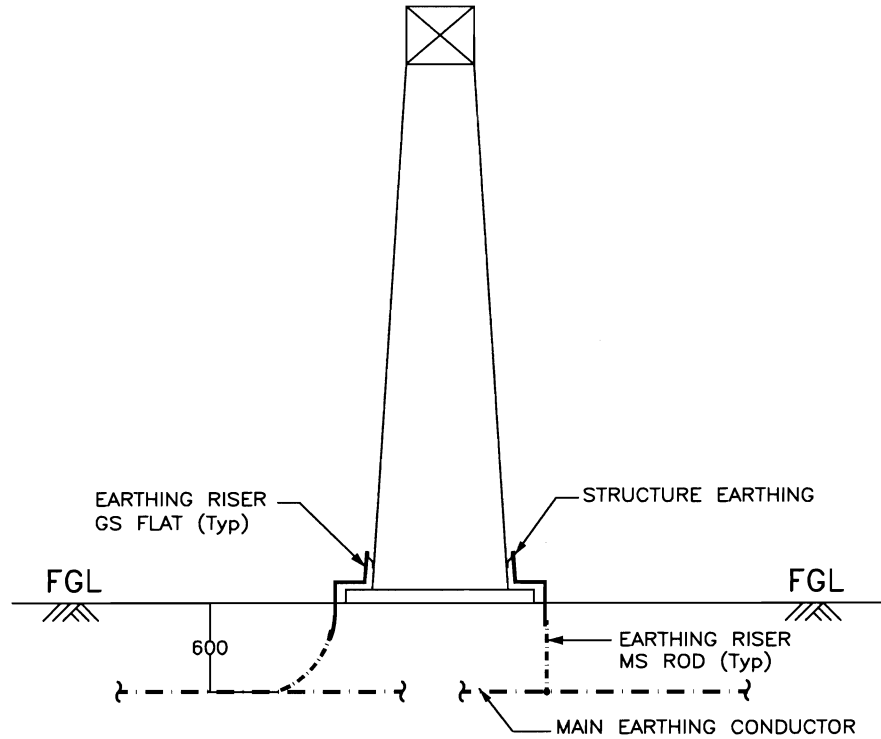


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TITLE:- STANDARD EARTHING DETAILS



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KKP/Power	KKP/Power	Dec-2013	

EARTHING OF TOWER WITHOUT PEAK



ELEVATION

LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT

NOTES :-

1. No. OF RISERS = 2 Nos.

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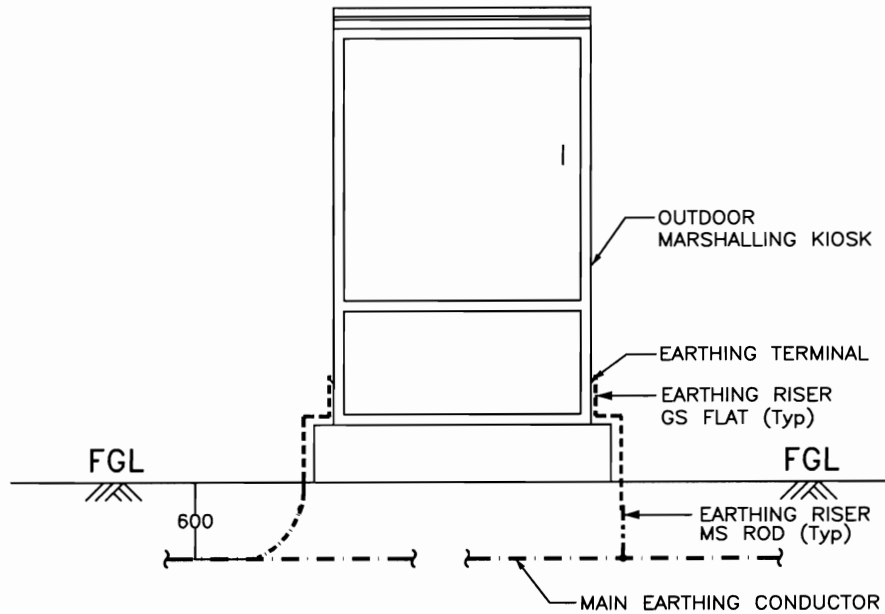


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SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF BAY MARSHALLING BOX



ELEVATION

LEGEND

— · — · — · —	40mm ϕ MS ROD
—————	75 x 12 mm GS FLAT
-----	50 x 6 mm GS FLAT

NOTE :-

1. No. OF RISERS = 2 Nos.

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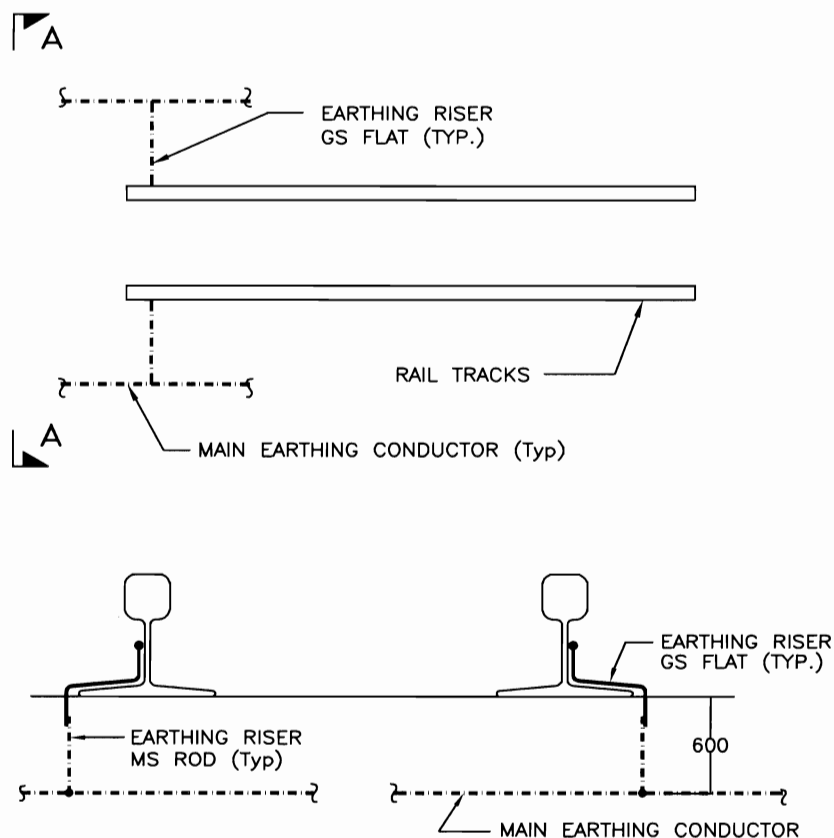


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SWITCHYARD ERECTION

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EARTHING OF RAIL TRACK



SECTION A - A

LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT

NOTES :-

1. EACH RAIL SHALL BE EARTHED AT 30M INTERVAL AND ALSO AT BOTH ENDS.

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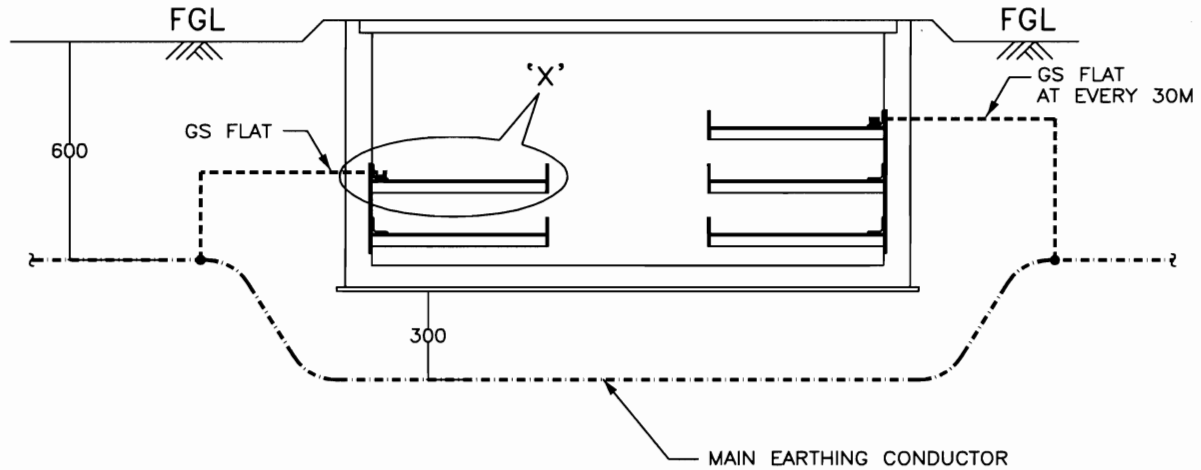


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SWITCHYARD ERECTION**

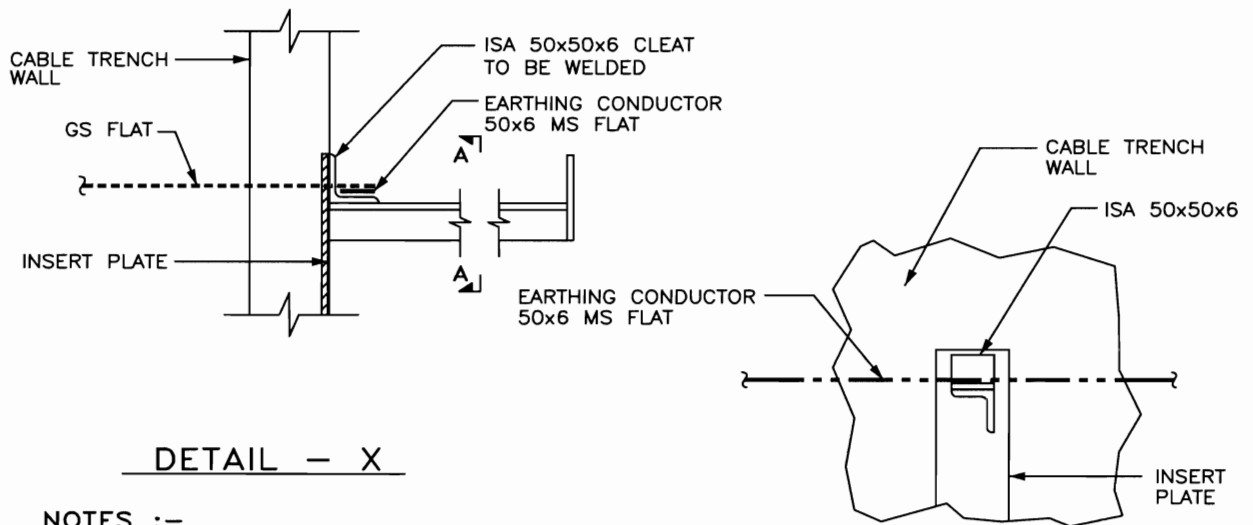
TITLE:- STANDARD EARTHING DETAILS

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EARTHING OF CABLE TRENCH



TYPICAL CROSS SECTION OF CABLE TRENCH



DETAIL - X

SECTION A - A

NOTES :-

1. MS FLAT SHALL RUN ON TOP TIER ALL ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACKS.
2. MS FLAT SHALL BE EARTHED AT 30M INTERVAL AND ALSO AT BOTH ENDS.

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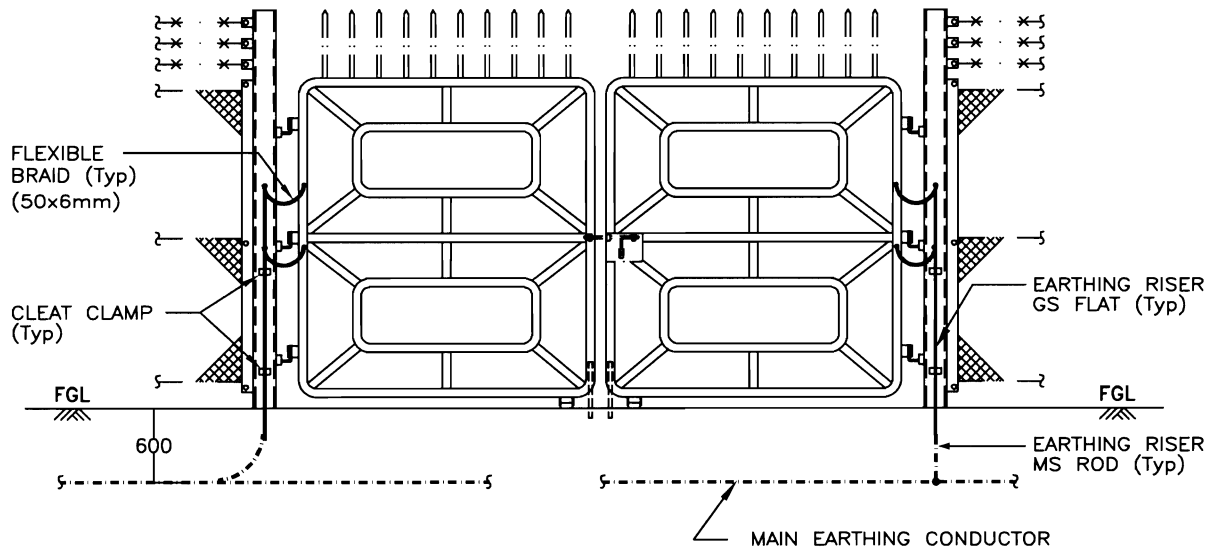
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Date

EARTHING OF GATES



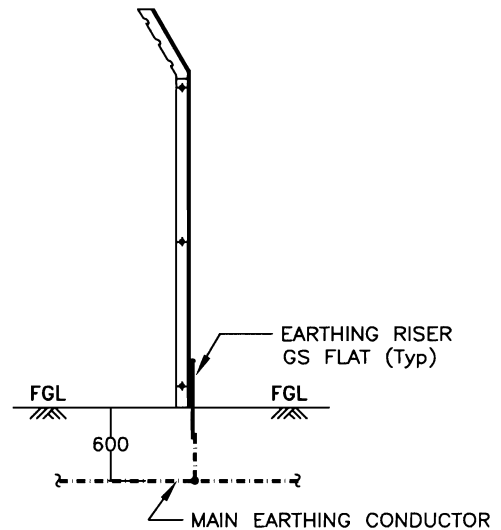
MAIN GATE

LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm MS FLAT

NOTES :-

	FENCE POST	MAIN GATE
1 . No. OF RISERS REQUIRED	1	2
2 . No. OF FLEXIBLE BRAID	—	4
3. ALL GATES & EVERY ALTERNATE FENCE SHALL BE CONNECTED TO EARTHING GRID.		



FENCE POST (ALTERNATE FENCE POST)

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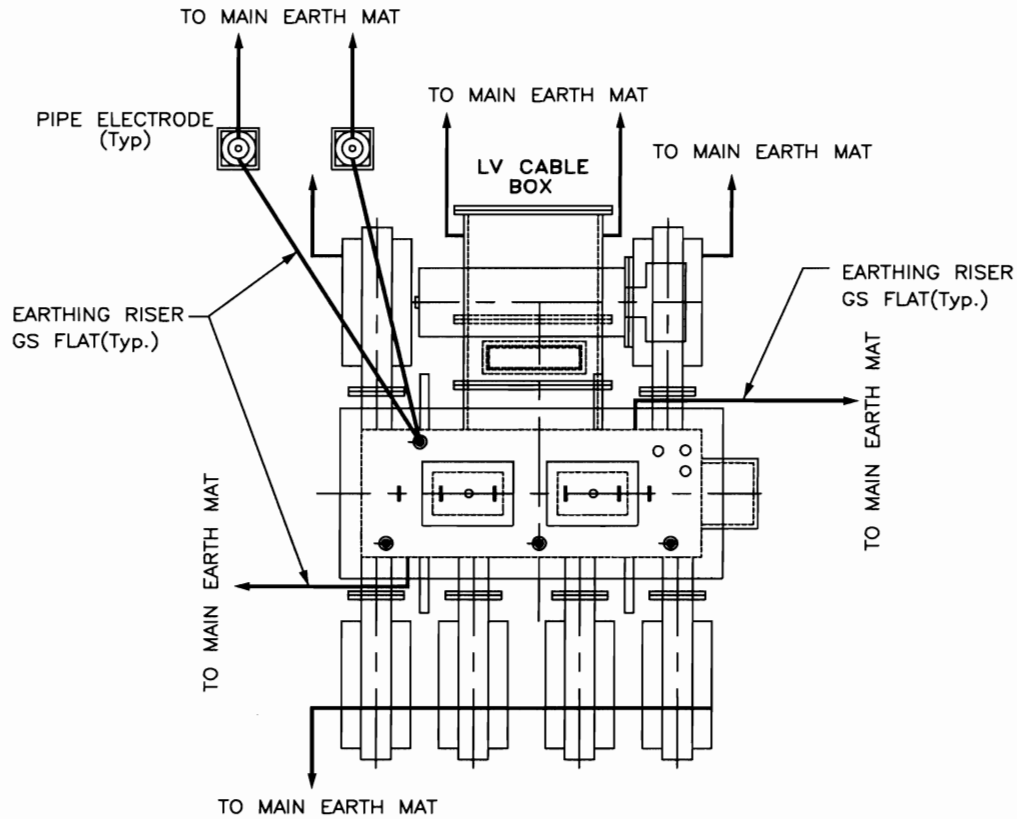


**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

<i>CKD</i>	<i>PRPD</i>	Dec-2013	Drawing No.:
CKD BY	PRPD BY	Date	C/ENG/STD/EARTHINGS/09
			SHEET # 24

EARTHING OF LT TRANSFORMER



PLAN

LEGEND

	40mm ϕ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS FOR MAIN TANK & T.M. MAR. BOX = 4 Nos.
2. No. OF RISERS FOR LV CABLE BOX & RADIATOR = 4 Nos.
3. No. OF RISERS FOR PIPE ELECTRODE = 2 Nos.
4. No. OF PIPE ELECTRODES REQUIRED = 2 Nos.

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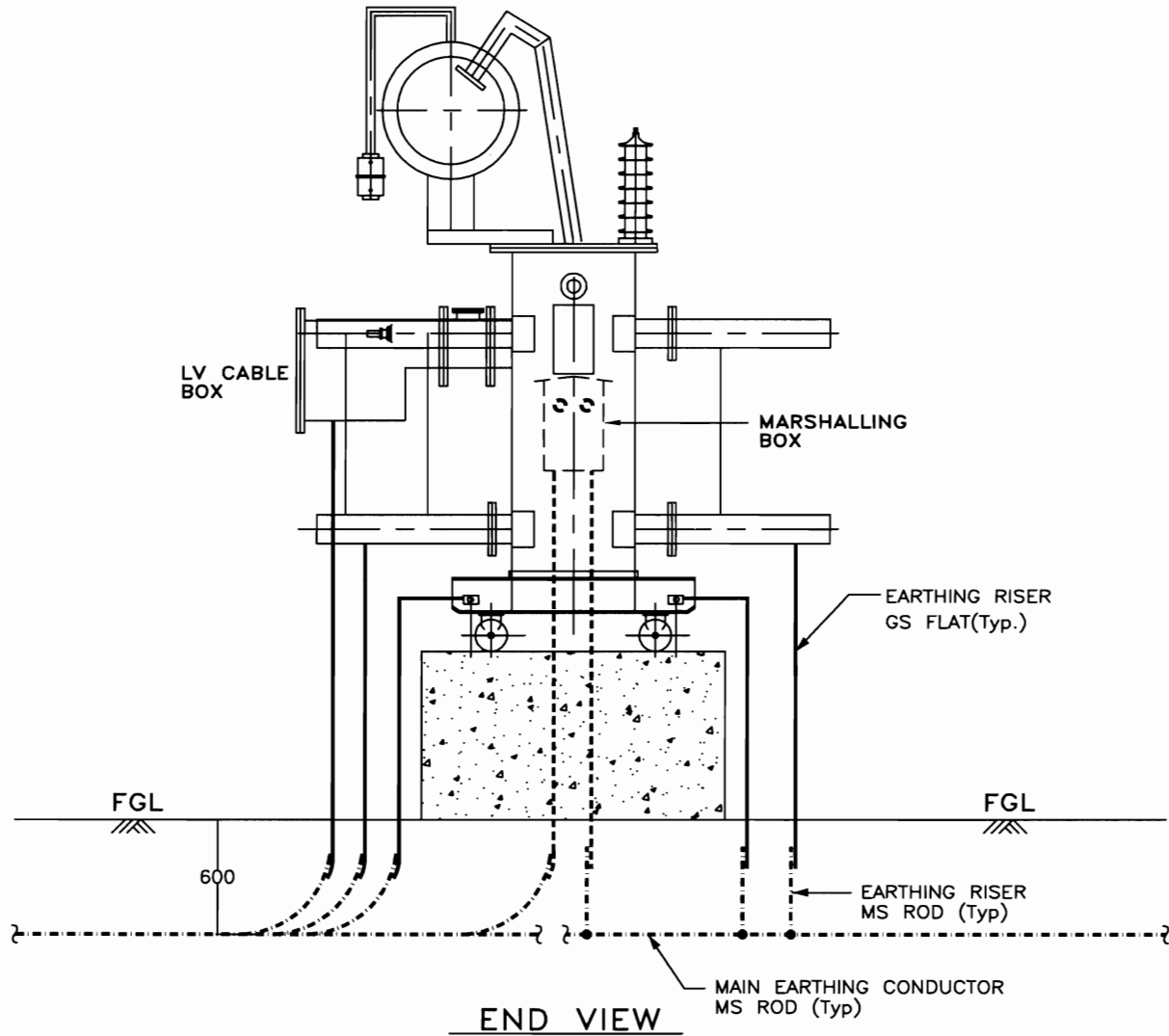


**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

<i>KK/Parthasar</i>	<i>KK/Parthasar</i>	Dec-2013	Drawing No.: C/ENG/STD/EARTHINGS/09 SHEET # 25
CKD BY	PRPD BY	Date	

EARTHING OF LT TRANSFORMER



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**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

<i>KK/Parsons</i>	<i>KK/Parsons</i>	Dec-2013	Drawing No.: C/ENG/STD/EARTHINGS/09 SHEET # 26
CKD BY	PRPD BY	Date	

EARTHING OF PYLON SUPPORTS

Pylon supports shall be grounded through 50x6mm GI flat to the ring around the Pylon supports of 75x12mm GI flat which in turn is connected to the main grid (40 mm dia MS rod) at 2 to 3 points as available.

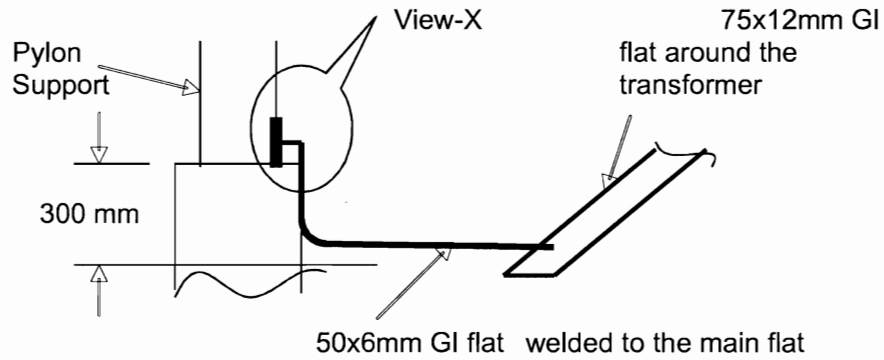


Fig.- Elevation (Earthing of Pylon Supports)

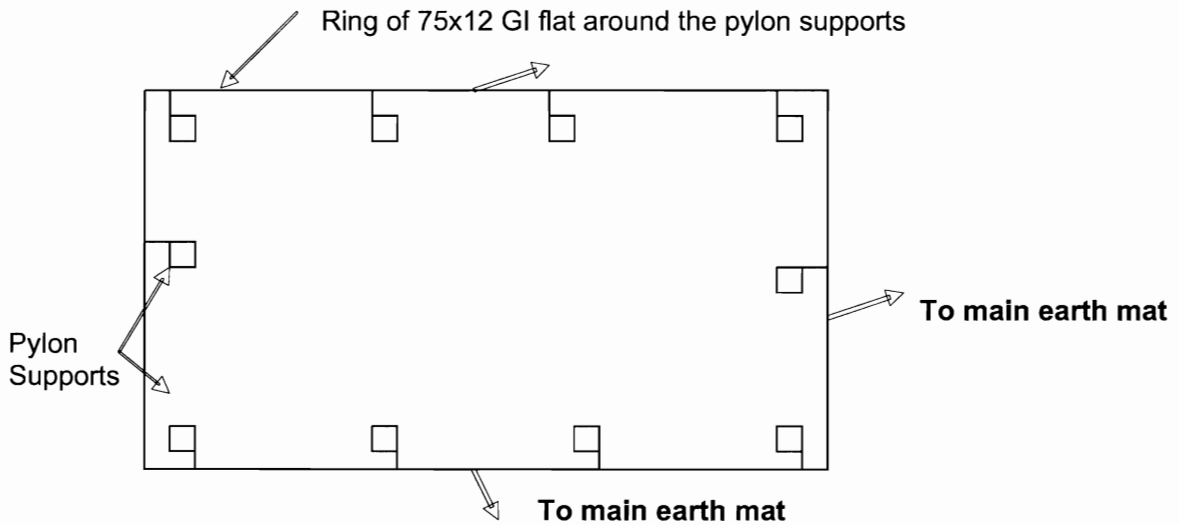


Fig.- Layout (Earthing of Pylon Supports)

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PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION

TITLE:- STANDARD EARTHING DETAILS

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Date

EARTHING OF HYDRANT/ HVW SPRAY PIPING

These pipes shall be grounded at pump house through 50x6mm GI flat connected to the main flat, 75x12mm running around the room.

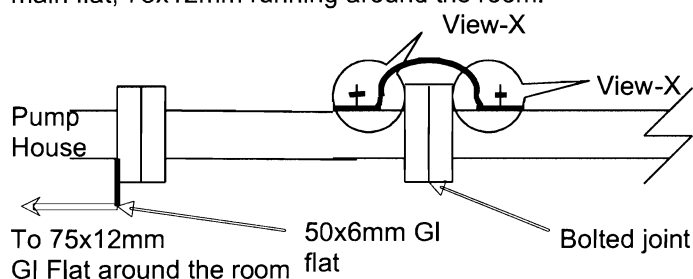


Fig.-Earthing of Hydrant / HVW Spray Piping

EARTHING OF HYDRANT POST/ HOSE BOX

A bolt shall be welded to these structures at the time of installation which can be used to connect them to the nearest riser or main 75x12mm GI flat through 50x6mm GI flat.

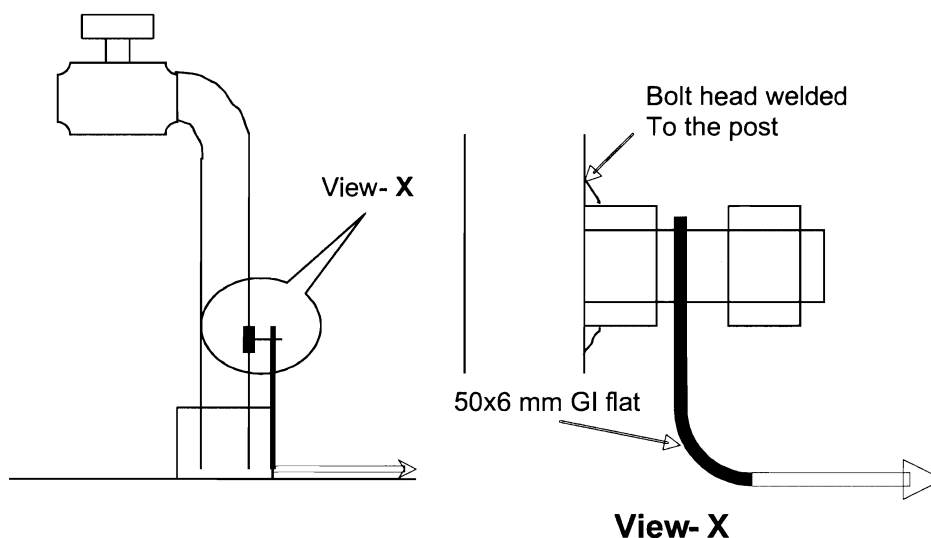


Fig.- Earthing of hydrant box / hose box

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**PROJECT :- TECHNICAL SPECIFICATION-
SWITCHYARD ERECTION**

TITLE:- STANDARD EARTHING DETAILS

K.K.Parkar

K.K.Parkar

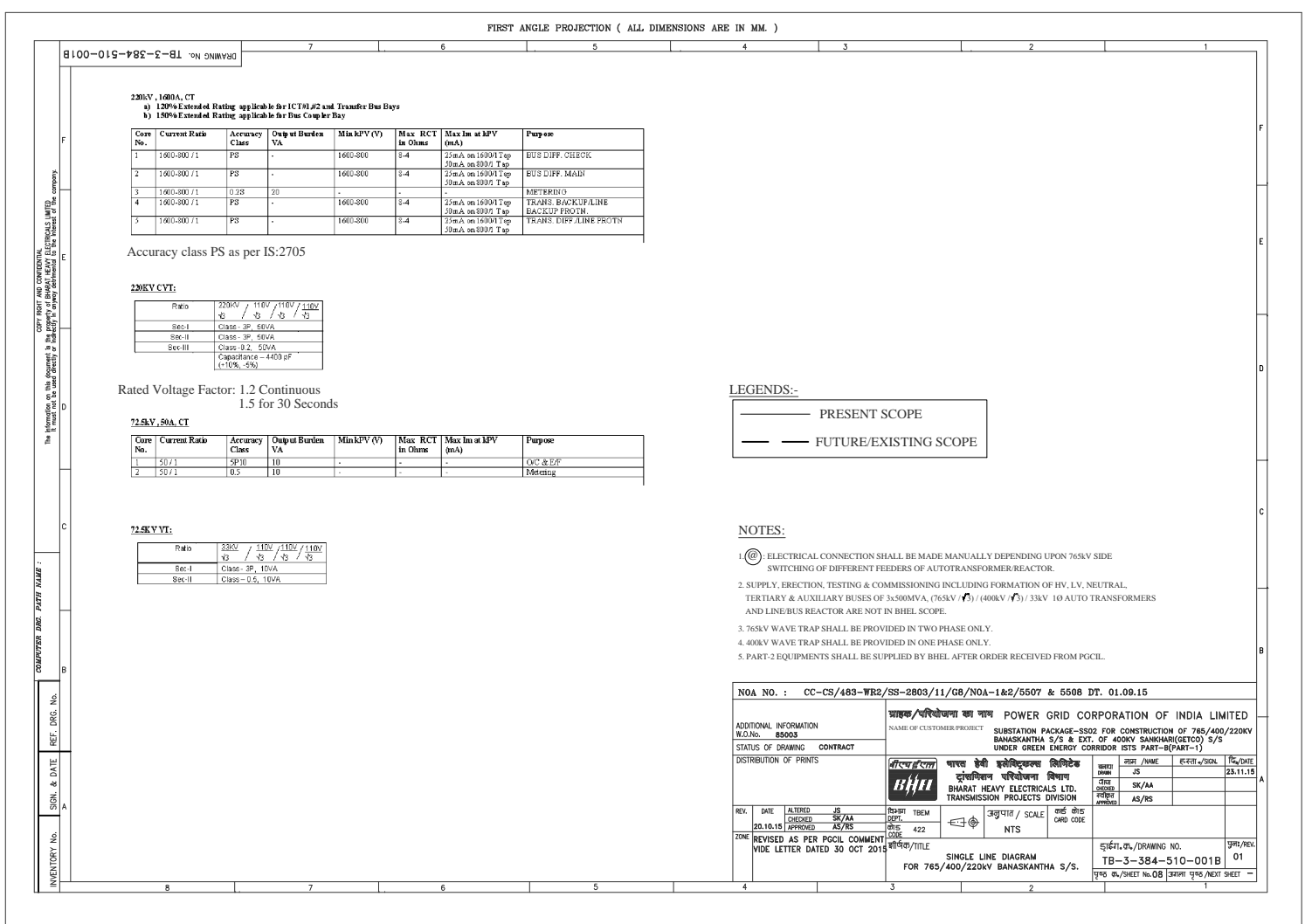
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