

COMPUTER DRG. PATH NAME :

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[illegible]

COMPUTER DRG. PATH NAME :




ATE

No.



### 765KV SINGLE LINE DIAGRAM

স্বাক্ষর/স্বাক্ষরিতব্য ব্যক্তি  
POWER GRID CORPORATION OF INDIA LIMITED  
SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV  
BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S  
UNDED GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)  
NAME OF CUSTOMER/PROJECT

STATUS OF DRAWING	DISTRIBUTION OF PRINTS			<div><div>सी.एस.ई.एम.</div><div></div><div>भारत हेवी इलेक्ट्रिकल्स लिमिटेड दुर्गासिन्धु पारिवेज्वा लिमिटेड BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION</div></div>	<div><div></div><div>उत्तुपात / SCALE NTS</div></div>	कार्ड कोड CARD CODE	गोता / NAME JS SK/AA AS/RS APPROVED	हस्ता / SIGN. 	दि/DATE 06.04.16
	REV.	DATE 30.01.17	ALTERED CHECKED APPROVED						
ZONE	REVISED AS PER COMMENT			शीट/TITLE SINGLE LINE DIAGRAM FOR 765/400/220KV BHUJ S/S.		कार्डिंग, नं./DRAWING NO. TB-385-510-001	पुनः/REV. 1	पृष्ठ नं./SHEET No. 01 आगता पृष्ठ/NEXT SHEET 02	

SINGLE LINE DIAGRAM  
FOR 765/400/220kV BHUJ S/S.

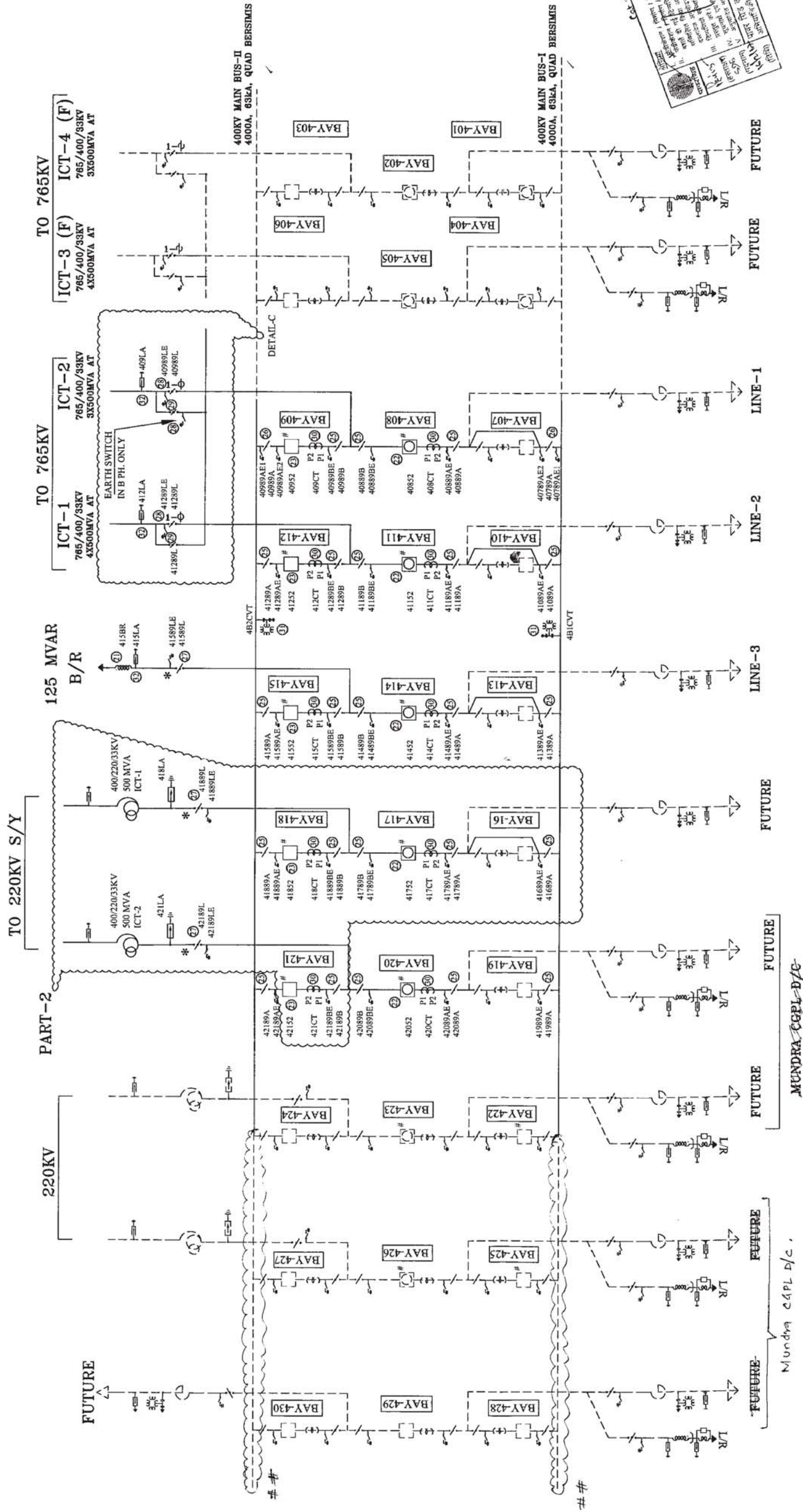
TB-385-510-001

ପୃଷ୍ଠ ନଂ./SHEET No. 01 ଆଗାମୀ ପୃଷ୍ଠା/NEXT SHEET 02



FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

DRAWING No. TB-385-510-001



Supply & Excim g extended  
portion bus also under present  
scope. (Amendment already issued).

400KV SINGLE LINE DIAGRAM

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16  
CC-CS/484-WR2/SS-2953/11/G8/NOA-I & II/7130 & 7131 DT 27 Dec 2016 [PART-2]

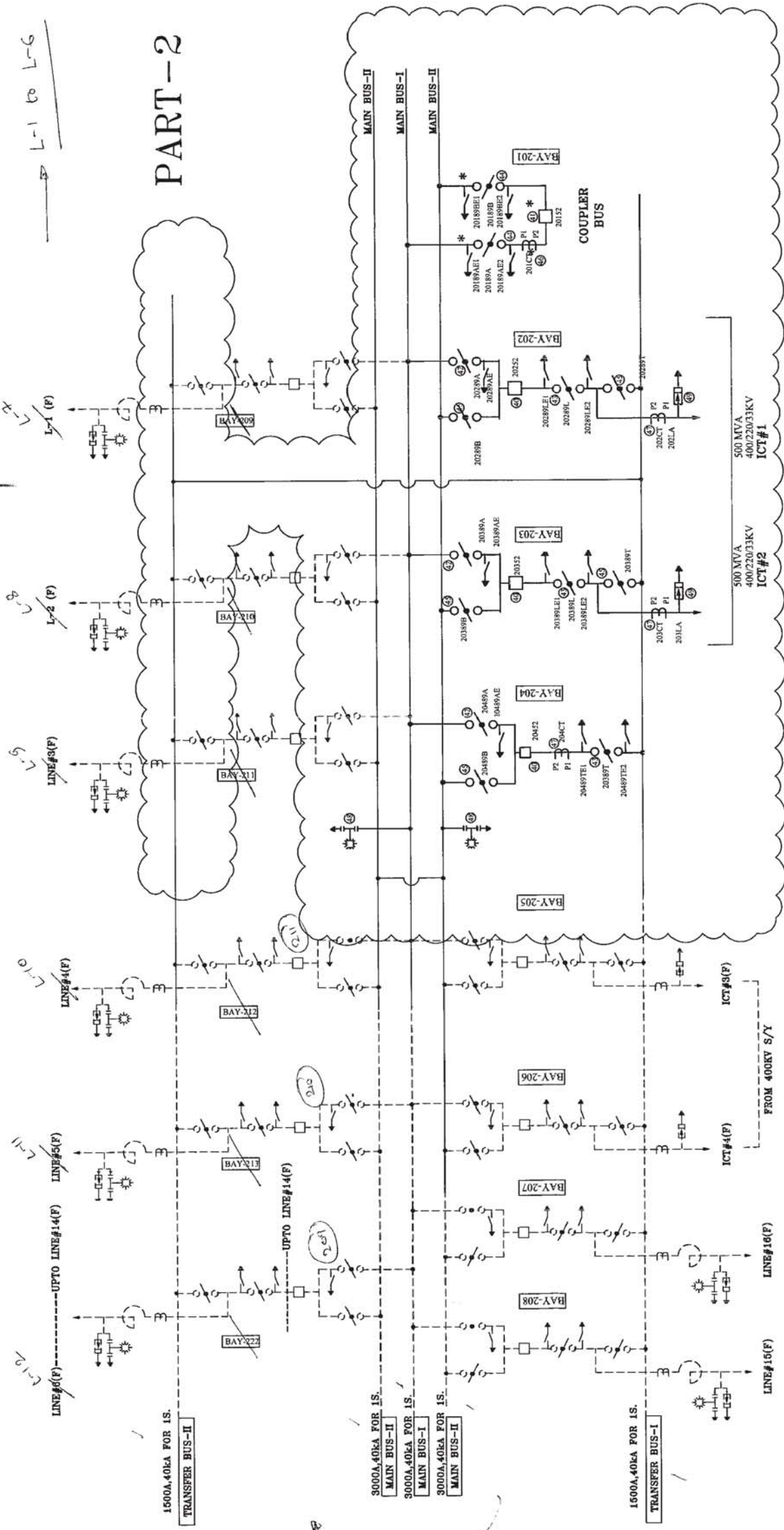
POWER GRID CORPORATION OF INDIA LIMITED  
SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV  
BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S  
UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1) & (PART-2)

DISTRIBUTION OF PRINTS				REV.				DATE	ALTERED	ZONE			
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				BHEL									



FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

1001-585-510-BT



PART-2

COMPUTER DRC. PATH NAME :

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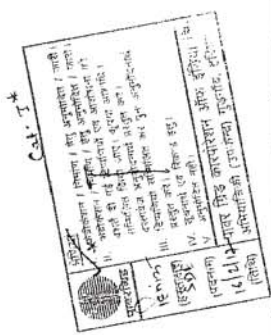
220KV SINGLE LINE DIAGRAM

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.18 CC-CS/484-WR2/SS-2953/11/G8/NOA-I & II/7130 & 7131 DT 27 Dec 2016 [PART-2]	
NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUU S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1) & (PART-2)	
STATUS OF DRAWING CONTRACT DISTRIBUTION OF PRINTS	
REV. DATE ALTERED 01 30.01.17 CHECKED APPROVED	
TBM DEPT. CODE 422	
SCALE NTS	
CARD CODE	
SHEET / DRAWING NO. TB-385-510-001	
SHEET / REV. 1	

63-1  
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DETAIL-C  
(ARRANGEMENT OF 765/400kV ICT AND AUX. BUS.)

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&amp;2/5727 &amp; 5728 DT. 31.03.16

[illegible]



FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

100-019-982-B1

BILL OF QTY. FOR 765kV MAIN EQUIPMENTS (50KA, 1 SEC):

SL.NO.	DESCRIPTION	RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
1	500 MVA, (1-PH) AUTOTRANSFORMER	765/400/33KV	7		PGCIL	T
2	110MVAR LINE REACTOR (1-PH) WITH NGR(550 Ohm)	765KV	7		PGCIL	LR/NGR
3	110MVAR BUS REACTOR (1-PH)	765KV	4		PGCIL	BR
4	SF6 CIRCUIT BREAKER WITH CR. WITH CSD (3-PH)	3150A	3		PGCIL	52
5	SF6 CIRCUIT BREAKER WITH CR. WITHOUT CSD (3-PH)	3150A	2		PGCIL	52
6	SF6 CIRCUIT BREAKER WITHOUT CR. WITH CSD (3-PH)	3150A	5		PGCIL	52
7	SF6 CIRCUIT BREAKER WITHOUT CR. WITH CSD (1-PH)	3150A	1		PGCIL	52
8	ISOLATOR WITH ONE E/SW (3 PH) VERTICAL KNEE TYPE	3150A	17		BHEL	89/89E
9	ISOLATOR WITH TWO E/SW (3 PH) VERTICAL KNEE TYPE	3150A	2		BHEL	89/89E1 /89E2
10	ISOLATOR WITH ONE E/SW (1 PH) VERTICAL KNEE TYPE	2000A	33		BHEL	89/89E1
11	ISOLATOR WITHOUT E/SW (1 PH) VERTICAL KNEE TYPE	2000A	12		BHEL	89
12	CURRENT TRANSFORMER (1 PH) WITH 120% EXTENDED CURRENT RATING.	3000A	24		BHEL	CT
13	CVT (1 PH.)	8800pF	12		BHEL	CVT
14	SURGE ARRESTER (1 PH.)	624 kV	24		BHEL	LA
15	WAVE TRAP (1 PH.) PEDESTAL TYPE.	1mH, 3150A	04		BHEL	WT

BILL OF QTY. FOR 400kV MAIN EQUIPMENTS (63KA, 1SEC):

SL.NO.	DESCRIPTION	RATING	QTY. (PART-1) (NO.)	QTY. (PART-2) (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
20	500MVA, (3-PH) AUTOTRANSFORMER.	400/220/33KV	0	2		BHEL	T
21	125MVAR BUS REACTOR (3-PH)	420 kV	1	0		BHEL	BR
22	SF6 CIRCUIT BREAKER WITH CR. WITH CSD (3-PH)	3150A	4	1		BHEL	52
23	SF6 CIRCUIT BREAKER WITHOUT CR. WITH CSD (3-PH)	3150A	3	2		BHEL	52
24	SF6 CIRCUIT BREAKER WITHOUT CR. WITHOUT CSD (3-PH)	3150A	0	0		BHEL	52
25	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	3150A	17	6		BHEL	89/89E
26	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	3150A	2	0		BHEL	89/89E1 /89E2
27	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	2000A	1	2		BHEL	89/89E1
28	ISOLATOR WITH ONE E/SW (1 PH) DOUBLE BREAK TYPE	3150A	7	0		BHEL	89/89E1
29	ISOLATOR WITHOUT E/SW (1 PH) DOUBLE BREAK TYPE	3150A	5	0		BHEL	89
30	CURRENT TRANSFORMER (1 PH) WITH 120% EXTENDED CURRENT RATING.	3000A	21	09		BHEL	CT
31	CVT (1 PH.)	4400pF	6	0		BHEL	CVT
32	SURGE ARRESTER (1 PH.)	336 kV	10	6		BHEL	LA
33	WAVE TRAP (1 PH.) PEDESTAL TYPE.	0.5mH, 2000A	0	0		BHEL	WT

BILL OF QTY. FOR 145 & 33kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	QTY. (PART-1) (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
60	SF6 CIRCUIT BREAKER FOR NGR BYPASS (1-PH)	145 KV, 1250A	2		BHEL	52
61	SURGE ARRESTER (1 PH.)	120 KV, 10 KA 5 KJ/KV	2		PGCIL	LA
62	NEUTRAL CT (1 PH.) WITH 120% EXTENDED CURRENT RATING.	33KV	5		PGCIL	CT

BILL OF QTY. FOR 220kV MAIN EQUIPMENTS: (16KA, 1 SEC).

SL.NO.	DESCRIPTION	RATING	QTY. (PART-2) (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
40	SF6 CIRCUIT BREAKER (3-PH)	1600A	3		BHEL	52
41	SF6 CIRCUIT BREAKER (3-PH)	2500A	1		BHEL	52
42	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	1600A	3		BHEL	89/89E
43	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	1600A	3		BHEL	89/89E1 /89E2
44	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	2500A	2		BHEL	89/89E1
45	TANDEM ISOLATOR WITHOUT E/SW(3PH)DOUBLE BREAK TYPE	1600A	5		BHEL	89
46	CURRENT TRANSFORMER (1 PH.) WITH 150% EXTENDED CURRENT RATING.	1600A	3		BHEL	CT*
47	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	1600A	9		BHEL	CT
48	CVT (1 PH.)	4400pF	6		BHEL	CVT
49	SURGE ARRESTER (1 PH.)	216 kV	6		BHEL	LA

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REF. DRG. No.

SIGN. & DATE

INVENTORY No.

NOA NO. : CC-CS/484-WR2/SS-2953/11/GB/NOA-I&2/5727 & 5728 DT. 31.03.16  
CC-CS/484-WR2/SS-2953/11/GB/NOA-I & II/7130 & 7131 DT 27 Dec 2016 [PART-2]

POWER GRID CORPORATION OF INDIA LIMITED  
SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV  
BHUI S/S & EXT. OF 765KV BANASKANTHA S/S  
UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1) & (PART-2)

REVISION	DATE	BY	CHKD	DATE
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SINGLE LINE DIAGRAM  
FOR 765/400/220KV BHUI S/S.

ड्राइंग. क्र./DRAWING NO.  
TB-385-510-001

पृष्ठ क्र./SHEET No.06 जगता पृष्ठ/NEXT SHEET 07



FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

100-015-585-B1

SYSTEM PARAMETERS

DESCRIPTION	765 kV	400 kV	220 kV	132 kV	66 kV	11 kV
1) HIGHEST SYSTEM VOLTAGE	800kV (r.m.s.)	420kV (r.m.s.)	245kV (r.m.s.)	145kV (r.m.s.)	72.5kV (r.m.s.)	12kV (r.m.s.)
2) SYSTEM OPERATING VOLTAGE	765kV	400kV	220kV	132kV	66kV	11kV
3) P.F. WITHSTAND VOLTAGE	830kV (r.m.s.)	630kV (r.m.s.)	460kV (r.m.s.)	275kV (r.m.s.)	140kV (r.m.s.)	28kV (r.m.s.)
4) LIGHTING IMPULSE WITHSTAND VOLTAGE	2100 kVP	1550 kVP	1050 kVP	650 kVP	325 kVP	75 kVP
5) SWITCHING IMPULSE WITHSTAND VOLTAGE	1550 kVP	1050 kVP	---	---	---	---
6) SYSTEM FAULT LEVEL	50KA FOR 1 Sec.	63KA FOR 1 Sec.	40KA FOR 1 Sec.	31.5KA FOR 1 Sec.	31.5KA FOR 1 Sec.	25KA FOR 1 Sec.
7) CREEPAGE	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV
8) SYSTEM EARTHING	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY

800KV CVT:

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kVP (V)	Max RCT in Ohms	Max Im at kVP (mA)	Purpose
1	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. CHECK
2	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. MAIN
3	3000-2000-500 / 1	0.2S 0.2S 0.2S 0.2S	20 20 20 20	-	-	-	METERING
4	3000-2000-500 / 1	0.2S 0.2S 0.2S 0.2S	20 20 20 20	-	-	-	METERING
5	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. BACKUP/LINE BACKUP PROTIN.
6	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	LINE PROTIN /LBB PROTIN

All protection class shall be accuracy class TPS as per IEC 60044-6. Metering cores shall be accuracy class 0.2S as per IEC: 60044-1

400KV CVT:

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kVP (V)	Max RCT in Ohms	Max Im at kVP (mA)	Purpose
1	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. CHECK
2	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. MAIN
3	3000-2000-500 / 1	0.2S 0.2S 0.2S 0.2S	20 20 20 20	-	-	-	METERING
4	3000-2000-500 / 1	0.2S 0.2S 0.2S 0.2S	20 20 20 20	-	-	-	METERING
5	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. BACKUP/LINE BACKUP PROTIN.
6	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. DIFF. /LINE PROTIN

All protection class shall be accuracy class TPS as per IEC 60044-6. Metering cores shall be accuracy class 0.2S as per IEC: 60044-1

Rated Voltage Factor: 1.2 Continuous  
1.5 for 30 Seconds

400KV CVT:

Ratio	400KV / 110V / 110V / 110V
Sec-I	Class - 0.5/3P, 50VA
Sec-II	Class - 0.5/3P, 50VA
Sec-III	Class - 0.2, 50VA
	Capacitance - 4400 pF
	(+10%, -5%)

Rated Voltage Factor: 1.2 Continuous  
1.5 for 30 Seconds

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16

ADDITIONAL INFORMATION  
W.O.No.  
STATUS OF DRAWING  
DISTRIBUTION OF PRINTS

NAME OF CUSTOMER/PROJECT  
SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV  
BHUI S/S & EXT. OF 765KV BANASKANTHA S/S  
UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1)

POWER GRID CORPORATION OF INDIA LIMITED  
BHARAT HEAVY ELECTRICALS LTD.  
TRANSMISSION PROJECTS DIVISION

REVISIONS  
REV. DATE ALTERED CHECKED APPROVED  
ZONE

SINGLE LINE DIAGRAM  
FOR 765/400/220KV BHUI S/S.

PROJECT NO. / DRAWING NO.  
TB-385-510-001

SHEET NO. / TOTAL SHEETS  
08 / 08



FIRST ANGLE PROJECTION ( ALL DIMENSIONS ARE IN MM. )

100-015-582-B1

DRWING NO.

1

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220kV, 1600A, CT

- a) 120% Extended Rating applicable for ICT#1, #2 and Transfer Bus Bays  
b) 150% Extended Rating applicable for Bus Coupler Bay

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	BUS DIFF. CHECK
2	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	BUS DIFF. MAIN
3	1600-800 / 1	0.2S	20	-	-	-	METERING
4	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	TRANS. BACKUP/LINE BACKUP PROT.N.
5	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	TRANS. DIFF./LINE PROT.N.

Accuracy class PS as per IS:2705

220KV CVT:

Ratio	220KV / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$
Sec-I	Class - 3P, 50VA		
Sec-II	Class - 3P, 50VA		
Sec-III	Class - 0.2, 50VA		
Capacitance - 4400 pF (+10%, -5%)			

Rated Voltage Factor: 1.2 Continuous  
1.5 for 30 Seconds

72.5KV, 50A, CT

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	50 / 1	5P10	10	-	-	-	O/C & E/F
2	50 / 1	0.5	10	-	-	-	Metering

72.5KV VT:

Ratio	33KV / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$
Sec-I	Class - 3P, 10VA		
Sec-II	Class - 0.5, 10VA		

LEGENDS:-

— PRESENT SCOPE

— FUTURE/EXISTING SCOPE

NOTES:

1. @ : ELECTRICAL CONNECTION SHALL BE MADE MANUALLY DEPENDING UPON 765KV SIDE SWITCHING OF DIFFERENT FEEDERS OF AUTOTRANSFORMER/REACTOR.
2. SUPPLY, ERECTION, TESTING & COMMISSIONING INCLUDING FORMATION OF HV, LV, NEUTRAL, TERTIARY & AUXILIARY BUSES OF 3x500MVA, (765KV /  $\sqrt{3}$ ) / (400KV /  $\sqrt{3}$ ) / 33KV 1Ø AUTO TRANSFORMERS AND LINE/BUS REACTOR ARE NOT IN BHEL SCOPE.
3. 765KV WAVE TRAP SHALL BE PROVIDED IN TWO PHASE ONLY.



NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16  
CC-CS/484-WR2/SS-2953/11/G8/NOA-I & II/7130 & 7131 DT 27 Dec 2016 [PART-2]

ADDITIONAL INFORMATION  
W.O.No. 85003  
STATUS OF DRAWING CONTRACT  
DISTRIBUTION OF PRINTS

NAME OF CUSTOMER/PROJECT  
SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART-1 & (PART-2)

POWER GRID CORPORATION OF INDIA LIMITED  
BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S  
TRANSMISSION PROJECTS DIVISION

REV. DATE ALTERED CHECKED APPROVED  
01 30.01.17  
ZONE 220KV (PART-2) ITEMS ADDED.

REV. DATE ALTERED CHECKED APPROVED  
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ZONE 220KV (PART-2) ITEMS ADDED.

REV. DATE ALTERED CHECKED APPROVED  
01 30.01.17  
ZONE 220KV (PART-2) ITEMS ADDED.



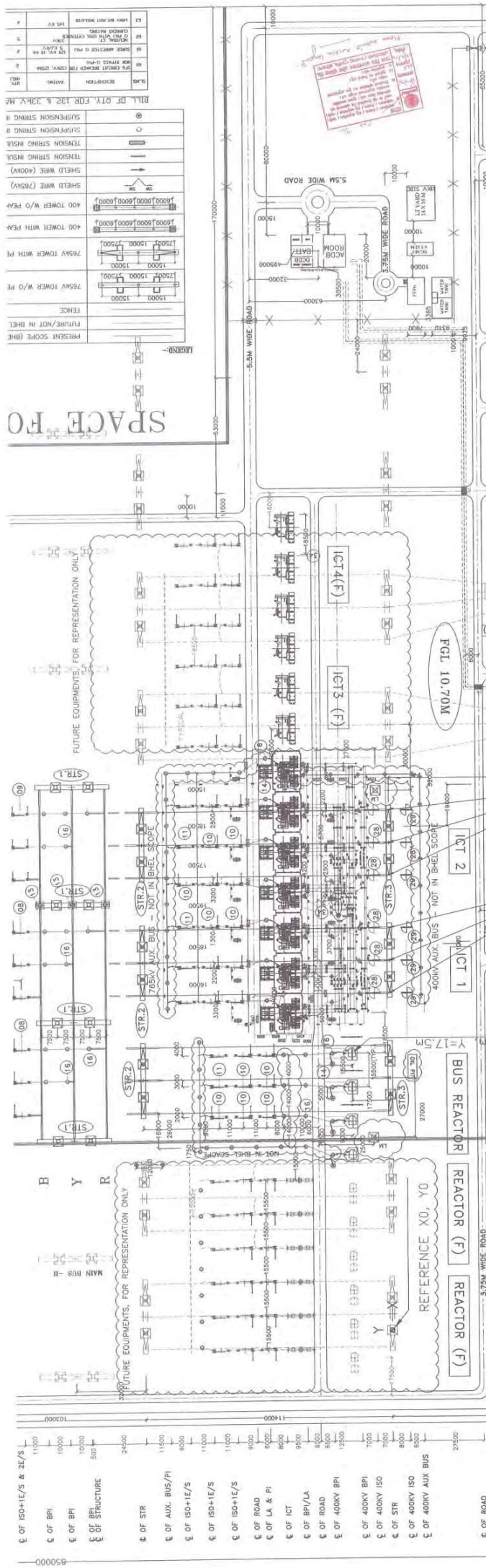
ENLARGED VIEW OF DRAWING  
LAYOUT PLAN FOR BHUJ  
765 KV/ 400 KV/ 220 KV SUBSTATION  
TB-385-510-002 Rev.04\*

Sl. No.	DESCRIPTION OF EQUIPMENT	1	2	3	4	5	6	7	8	9
1	HIGHEST SYSTEM VOLTAGE	765KV	400KV	220KV	33KV	11KV	4KV	2KV	1KV	0.4KV
2	NORMAL SYSTEM VOLTAGE	765KV	400KV	220KV	33KV	11KV	4KV	2KV	1KV	0.4KV
3	RATED FREQUENCY	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz
4	NO. OF PHASES	3	3	3	3	3	3	3	3	3
5	1) FULL WAVE LIGHTNING SURGE WITHSTAND VOLTAGE (1.2/50μsec)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
6	2) OPEN WAVE LIGHTNING SURGE WITHSTAND VOLTAGE (1.2/50μsec)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
7	3) COORDINATION VOLTAGE	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
8	4) MAX. TRANSIENT OVERVOLTAGE (T.O.V.)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
9	5) SYSTEM NEUTRAL EXPOSURE	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV

Sl. No.	DESCRIPTION OF EQUIPMENT	1	2	3	4	5	6	7	8	9
1	HIGHEST SYSTEM VOLTAGE	765KV	400KV	220KV	33KV	11KV	4KV	2KV	1KV	0.4KV
2	NORMAL SYSTEM VOLTAGE	765KV	400KV	220KV	33KV	11KV	4KV	2KV	1KV	0.4KV
3	RATED FREQUENCY	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz
4	NO. OF PHASES	3	3	3	3	3	3	3	3	3
5	1) FULL WAVE LIGHTNING SURGE WITHSTAND VOLTAGE (1.2/50μsec)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
6	2) OPEN WAVE LIGHTNING SURGE WITHSTAND VOLTAGE (1.2/50μsec)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
7	3) COORDINATION VOLTAGE	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
8	4) MAX. TRANSIENT OVERVOLTAGE (T.O.V.)	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV
9	5) SYSTEM NEUTRAL EXPOSURE	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV	1150KV

CONDUCTOR & STRINGING DETAILS - 400KV

Sl. No.	DESCRIPTION	1	2	3	4	5	6	7	8	9
1	MAIN BUS - I & II	(AT 15M HEIGHT)	400MM SUB-CONDUCTOR WITH POLARIZED DOUBLE STRUNG							
2	JACKBARS	(AT 22M HEIGHT)	400MM SUB-CONDUCTOR WITH POLARIZED DOUBLE STRUNG							
3	DROPPERS/JUMPERS		400MM SUB-CONDUCTOR WITH POLARIZED DOUBLE STRUNG							
4	EQUIPMENT INTERCONNECTION	(AT 8M HEIGHT)	400MM SUB-CONDUCTOR WITH POLARIZED DOUBLE STRUNG							
5	EARTHWIRE	(AT 29.5M HEIGHT)	7/3.6mm <sup>2</sup> GI WIRE (10.88mm DIA)							
6	BUS CY, CYT & LA IN LINE BAYS		400MM SUB-CONDUCTOR WITH POLARIZED DOUBLE STRUNG							



REV.	DATE	DESCRIPTION
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3		APPROVED
4		REV.

REV.	DATE	DESCRIPTION
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1		DATE
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REV.	DATE	DESCRIPTION
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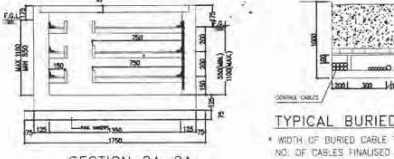
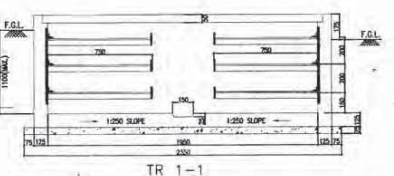
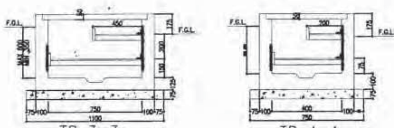


ALL DIMENSIONS ARE IN mm.

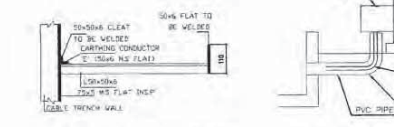
2. THE LOCATION OF CABLE TRENCHES MARKED IN THIS DWG MAY BE SLIGHTLY MODIFIED TO SUIT SITE CONDITIONS.
3. OPENINGS FOR TAKING OUT PVC PIPES TO EQUIPMENTS SHALL BE PROVIDED IN CABLE TRENCHES.
4. OPENING OF SIZE SUITABLE TO DIA 50/110 PIPE SHALL BE PROVIDED BELOW TOP CABLE SUPPORT.
5. BMB = INDICATES BAY MARSHALLING BOX.
6. BMBs SHALL BE PLACED IN THE LOCATION SHOWN. EXACT COORDINATES TO BE SUITABLY DECIDED AT SITE.
7. CABLES SHALL BE LAID IN MULTIPLE RACK SUPPORT (ANGLES).
8. CABLE SUPPORT SHALL BE PROVIDED AT EVERY 0.75m INTERVAL.
9. INSURTS MUST BE EMBEDDED AT 10% INTERVAL.
10. AUXILIARY POWER CABLES SHALL BE PROVIDED IN SEPARATE CABLE SUPPORT.
11. CONTROL CABLES IN BOTTOM TIERS, AS PER TECHNICAL SPECIFICATION.
12. BURIED CABLEING SHALL BE DONE AS PER SPECIFICATION (LOCATION OF CABLES).
13. BURIED CABLES FOR LIGHTING PURPOSE SHALL BE AS PER LIGHTING SHOUT.
14. LOCATION OF CABLE TRENCHES INSIDE CONTROL ROOM SHALL BE SHOWN SEPARATELY.
15. EARTH CONDUCTOR 50x6 WS FLAT TO BE WELDED ON THE CABLE SUPPORT BEFORE INSTALLATION OF CABLES.
16. CABLES CROSSING ROAD/RAIL TRACK SHALL BE LAID IN BOX CURVE.
17. FOR POWER & CONTROL SEPARATE PIPES SHALL BE USED CONSIDERING 60% DOW FOR EACH PIPE (I.E., 40% FILLING CRITERIA).
18. PLACEMENT OF AC MC WIRE AND ITS CABLE TRENCH IS TENTATIVE. EXACT COORDINATES TO BE SUITABLY DECIDED AT SITE.
19. INDICATES CABLES LAID IN PVC PIPES OF 50/110mm OUTER DIA AT DEPTH OF 300mm (MAX).
20. FROM EQUIPMENT TO CABLE TRENCH SHALL RUN IN PVC PIPES.
21. MARKED THIS (1) INDICATES CABLE ENTRY/EXIT FROM EQUIPMENT.
22. ALL OTHER DETAILS PERTAINING TO CIVIL WORKS SHALL BE REFLECTED IN THE RESPECTIVE CIVIL DRAWINGS.
23. PVC PIPES SHALL BE SECURELY FIXED AT BOTH ENDS, EITHER EMBEDDED IN CONCRETE OR PROPERLY CLAMPED.
24. AFTER LAYING THE CABLES THE ENDS OF PIPES SHALL BE FULLY SEALED TO PREVENT INGRESS OF WATER INSIDE THE PIPE.
25. CONTROL CABLES & POWER CABLES MUST NOT BE LAID IN SEPARATE PVC PIPES.
26. CABLE TRENCH SHALL BE PROVIDED ON MARSHALLING BOX SIDE OF EQUIPMENT.
27. THE PURPOSE OF TRENCH LAYOUT DRAWING IS FOR USE AS FOLLOWS:
  - TO BE USED AS CIVIL INPUT FOR CABLE TRENCHES.
  - FOR ERECTION OF CABLE RACKS AT SITE.
  - FOR CABLE LAYING AND ROUTING AT SITE.
28. CABLE RACK AND SUPPORTS SHALL BE PAINTED AFTER INSTALLATION WITH 2 COATS OF METAL PRIMER (COMPRISING OF RED OXIDE & ZINC CHROMATE IN A SYNTHETIC MEDIUM) FOLLOWED BY TWO FINISHING COAT OF ALUMINUM PAINT.
29. INDICATES BRICK KIOSK SHALL BE PROVIDED IN TRENCH WHERE FUTURE TRENCH/EQUIPMENT PIPE TERMINATED AT PRESENT SCOPE OF TRENCH.
30. SUITABLE PULL OUT BOX SHALL BE PROVIDED IF REQUIRED WHERE CABLE SHALL BE LAID IN PVC PIPE.
31. LONGITUDINAL SLOPE IN CABLE TRENCH SHALL BE TYPICALLY 1:1000.
32. INDICATE PIPE CURVE.
33. RACK ASSEMBLES FOR CABLE TRENCHES SHALL BE PROVIDED ON THE FACE OF TRENCH WALL MARKED THIS.
34. FOR ALL CIVIL WORKS EXECUTION POWER GRID APPROVED/RELEASED DROPS SHALL BE FOLLOWED.
35. UNDERGROUND LAYING OF FIBER OPTIC CABLE SHALL BE DONE IN GI PIPE.
36. FOR CABLE TRENCHES AND CONSTRUCTION DETAILS PLEASE REFER TO THE STANDARD CABLE TRENCH SECTION DRAWING RELEASED FOR CONSTRUCTION FOR BIDDING 5/2.
37. FROM BENCH MARK TO PIPE TRENCH ARRANGEMENT FOR EQUIPMENTS LIKE CT, CVT, OR A ISOLATOR SHALL BE ISSUED SEPARATELY.
38. FOR CABLEING FROM CONTROL ROOM TO SMD/INSTRUMENT MAIN TRENCH, CABLE SHALL BE LAID SUCH THAT BOTTOM TIERS ARE PROPERLY FILLED FIRST.
39. BURIED CABLE TRENCH TO BE USED FOR CABLES FOR DE SET, FIRE PROTECTION PUMP HOUSE & LIGHTING.

REFERENCE DWG :-

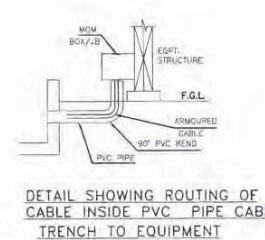
DWG. NO.	TITLE
TB-385-510-001	SINGLE LINE DIAGRAM 765/400kV BHUJ S/S
TB-385-510-002	ELECTRICAL LAYOUT PLAN FOR 765/400kV BHUJ S/S



**TYPICAL BURIED CABLE TRENCH**



TYPICAL CABLE SUPPORT



DETAIL SHOWING ROUTING OF  
CABLE INSIDE PVC PIPE CABLE  
TRENCH TO EQUIPMENT

PVC PIPES CLASS IV (AS PER IS:4985)			
FOR TESTS AND 400KV EQUIPMENTS			
S.NO.	ITEM	TO	FOR POWER CABLE, FIBRE OPTIC CABLE 50MM ØS, 110KV ØS, 150MM ØS, 170MM ØS
1.	FRENCH	Ø 100 (C/ST)	—
2.	Ø 100 (C/ST)	EACH POLE OF 110V / 132V	—

QUANTITY OF NP3 RCC PIPE FOR ROAD CROSSING		
Σ NO.	450MM ØD	300MM ØD
TR-2-2	02 NO.	01 NO.

PVC PIPES CLASS IV (AS PER IS:1905)					
FOR 66/33V EQUIPMENTS					
S.NO	FROM	TO	FOR POWER CABLE: FOR CONTROL CABLE		
			50MM TO 100MM Ø	100MM TO 150MM Ø	150MM Ø
1	TRENCH	IB (P/C)	-	-	1
2	IB (P/C)	DASH POLE OR PT / CT	-	-	1
3	TRENCH	UGC OF CB	1	-	1

ADDITIONAL INFORMATION
W.O.No.
STATUS OF DRAWING

STATUS OF DRAWING	
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DISTRIBUTION OF PRINT	
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DISTRIBUTION OF PRINT

10

REV.	DATE	ALTERED
		CHECKED

Q1	16.11.16	CHECKED
		APPROVED
ZONE	REVISED AS PER	

~~AND TO INVERT~~

[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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ग्राहक/परियोजना का नाम NAME OF CUSTOMER	POWER GRID CORPORATION OF INDIA LTD
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NAME OF PROJECT :  
SS01 for Construction of 765/400/220kV BHW POOL (New) S/S and

Extension of 765kV Banaskantha S/S under  
Green Energy Corridors : Inter-State Transmission Scheme (ISTS) - Part C [PART-2]

नीचे दी गई	आपका देखी इलेक्ट्रिकल्स लिमिटेड	नाम /NAME	हस्ता./SIGN.
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द्वारा संस्थान परियोजना दिनांक  
BHARAT HEAVY ELECTRICALS LTD.

BHARAT HEAVY ELECTRICALS LTD.		स्वीकृत		AS	
TRANSMISSION PROJECTS DIVISION		APPROVED			

विभाग DEPT.		अनुपात / SCALE	काड CARD	काड CODE
कोड		NTS		

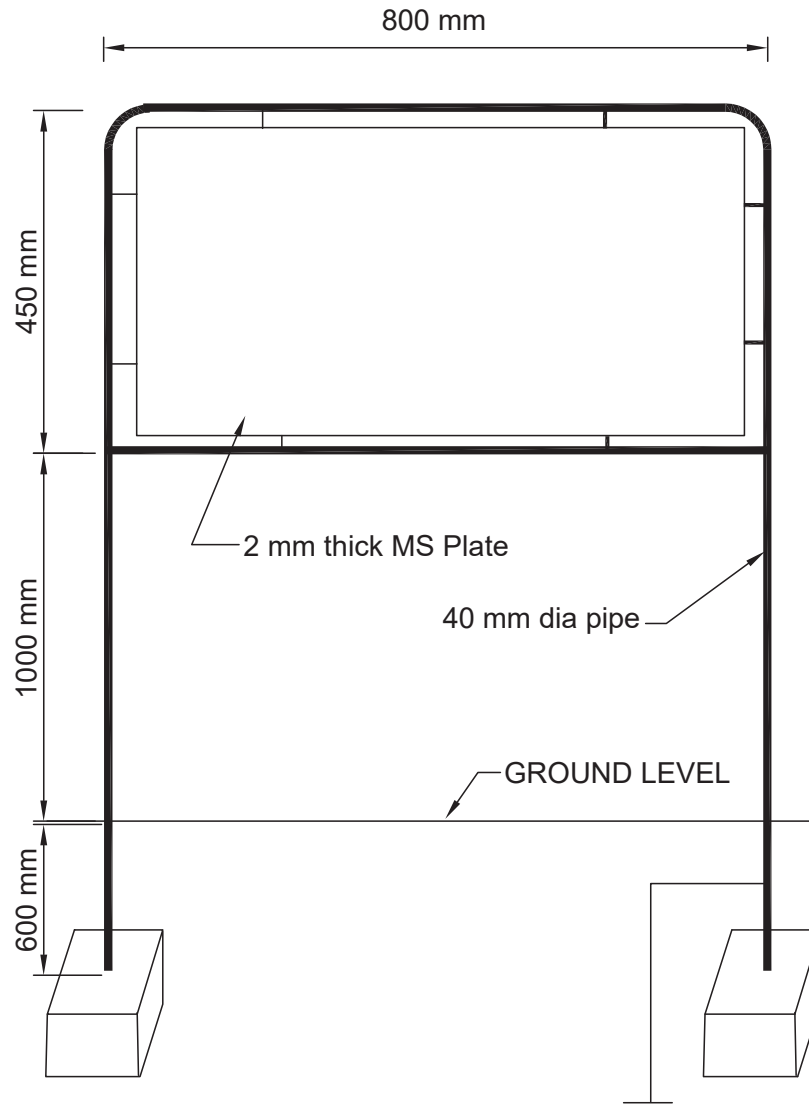
CODE			
शीर्षक/TITLE	डाईग. नं./DRAWING NO.		

CABLE TRENCH LAYOUT FOR 220kV YARD 765/400/220 KV BHUJ POOL SS (PART-2)	<div style="text-align: right;">TB-392-510-008</div> <div style="font-size: small;">             DRAWN BY: <input type="text"/> CHECKED BY: <input type="text"/>              DESIGNED BY: <input type="text"/> APPROVED BY: <input type="text"/> </div>
--	--

5 4 3 2 (PRINT SIZE A)

Approved vide C/ENAG/WR/AMUS-50





**POWER GRID CORPORATION  
OF INDIA LIMITED**  
( A Government of India Enterprise )



**PROJECT :- STANDARD**


**TITLE:- STANDARD BAY NAME PLATE**

CKD BY	PRPD BY	18/02/2008	Drawing No.: C/ENG/STD/BAY NAME PLATE	Rev. 00
		Date		

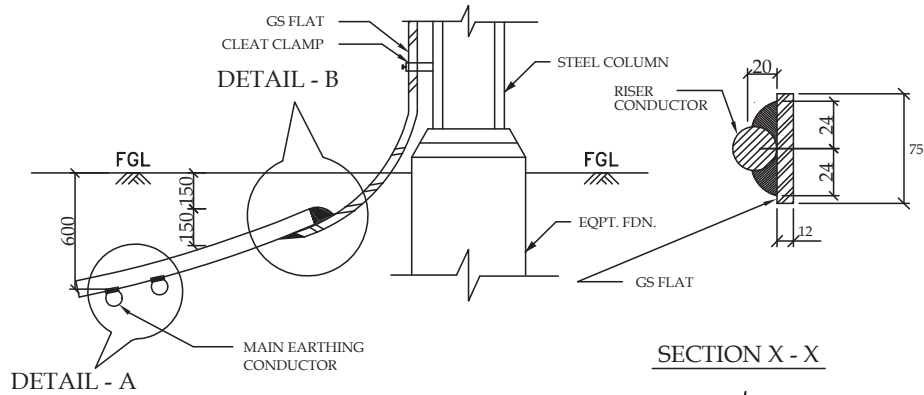
### GENERAL INSTRUCTION FOR EARTHING:

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 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.

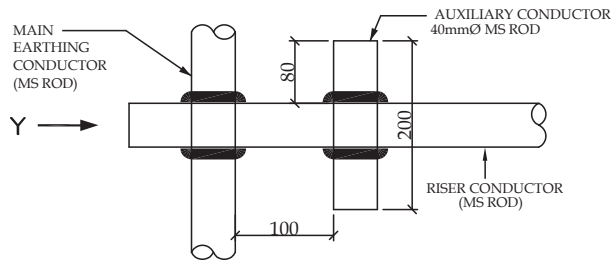
**RELEASED FOR CONTRUCTION**

<div>POWER GRID CORPORATION OF INDIA LIMITED</div> <div>( A Government of India Enterprise )</div>			<div></div> <div>पावरग्रिड</div>	
PROJECT :-     STANDARD				
TITLE:-   STANDARD EARTHING DETAILS				
<i>SK/Prashar</i>	<i>SK/Prashar</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 1	Rev. 00
CKD BY	PRPD BY	Date		

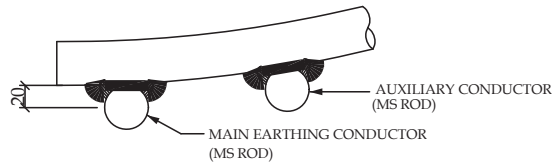




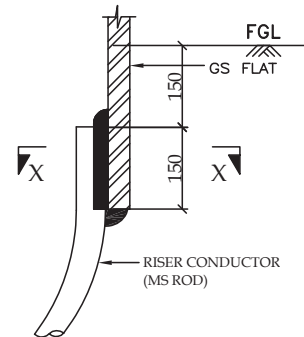
TYPICAL DETAILS OF RISER



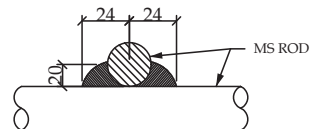
PLAN



ELEVATION  
DETAIL - A



ELEVATION  
DETAIL - B



VIEW - Y

RELEASED FOR CONTRUCTION

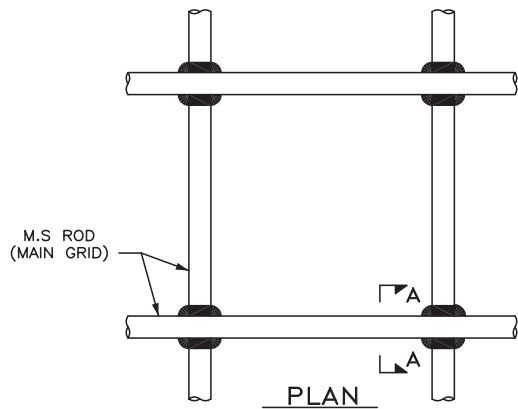
**POWER GRID CORPORATION  
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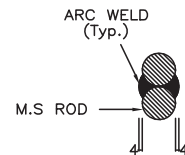
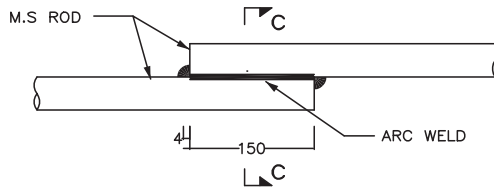
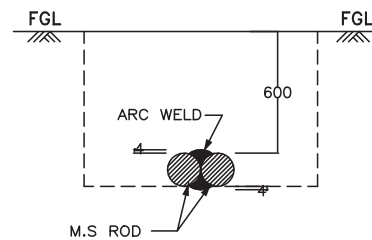
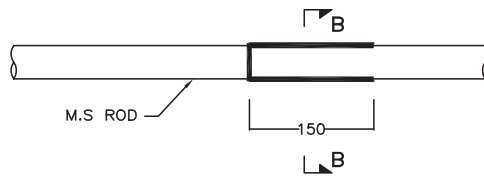
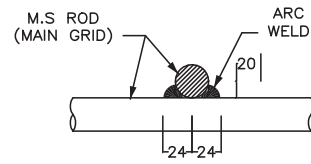
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 2	Rev. 00
AK/Perkar	AK/Perkar	12/11/2007		



DETAIL OF CROSS JOINT



DETAIL OF LAP JOINT

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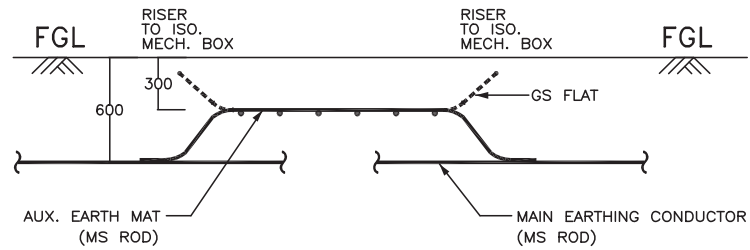


PROJECT :- STANDARD

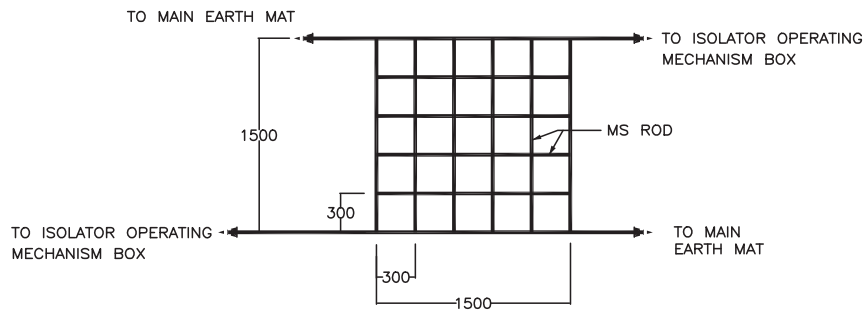
TITLE:- STANDARD EARTHING DETAILS

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHING SHEET # 3	Rev. 00
<i>AK/Anshu</i>	<i>AK/Anshu</i>	12/11/2007		





ELEVATION



PLAN

RELEASED FOR CONTRUCTION

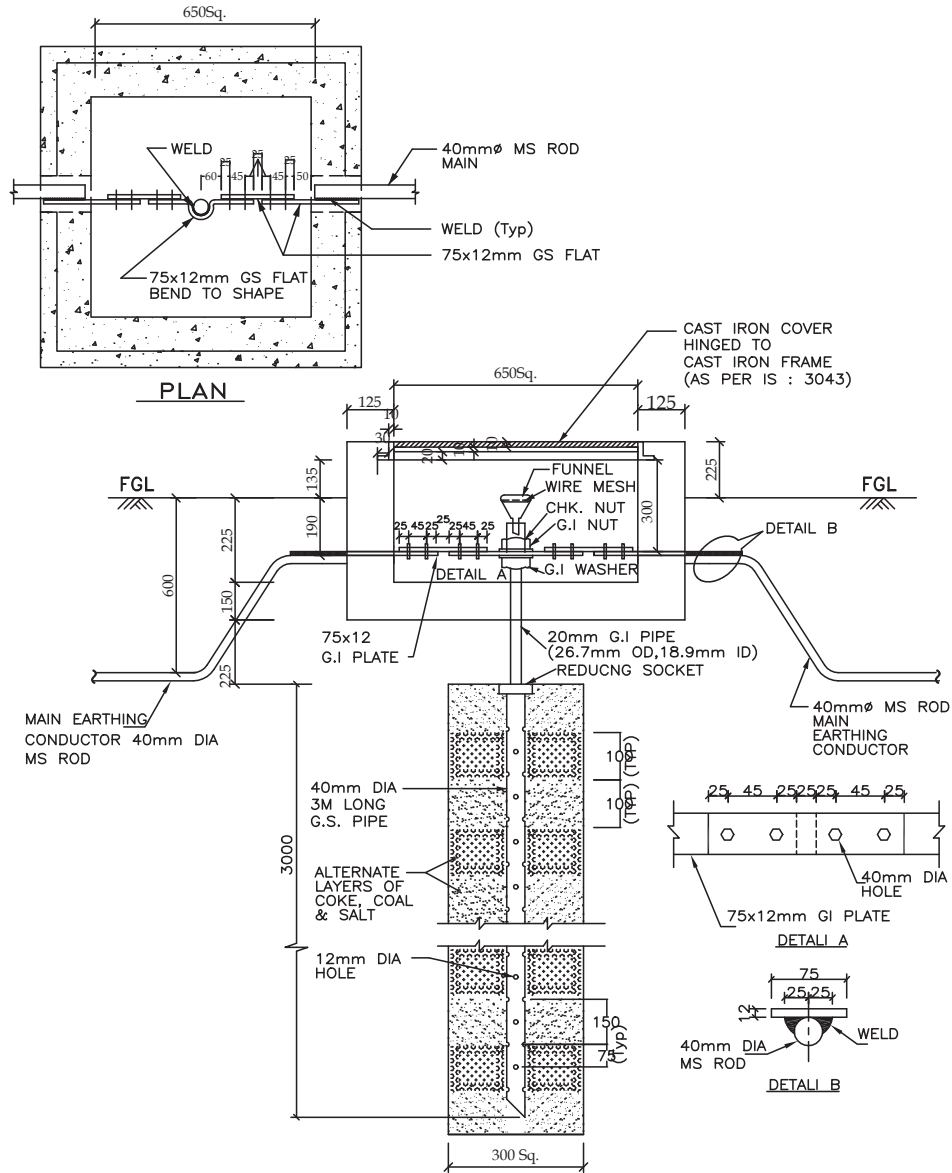
POWER GRID CORPORATION  
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PROJECT :- STANDARD

TITLE:- STANDARD EARTHING DETAILS

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 4	Rev. 00
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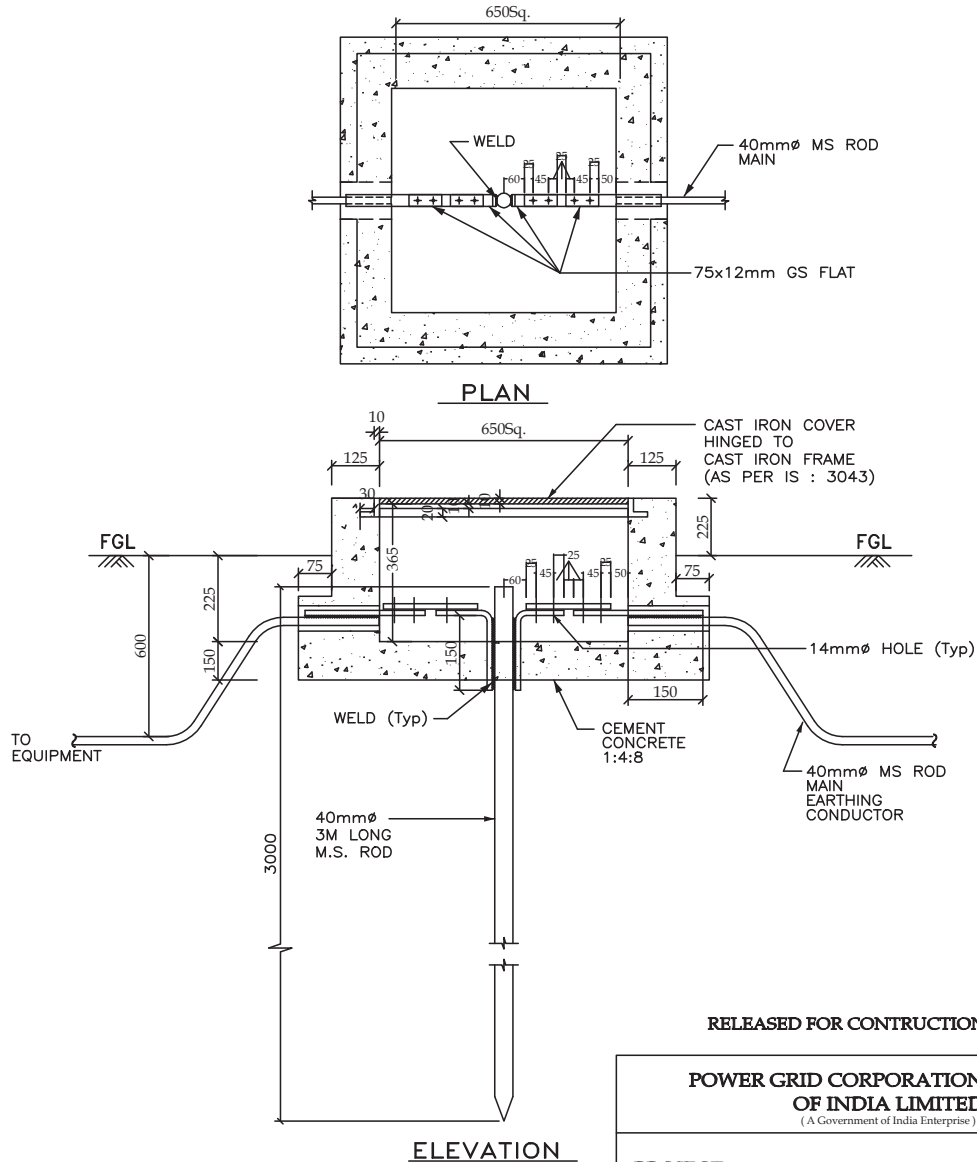
PROJECT :- STANDARD

TITLE:- STANDARD EARTHING DETAILS

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHING SHEET # 5	Rev. 00
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# ROD ELECTRODE WITH TEST LINK FOR LM, TOWER WITH PEAK, CVT, LA



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**POWER GRID CORPORATION  
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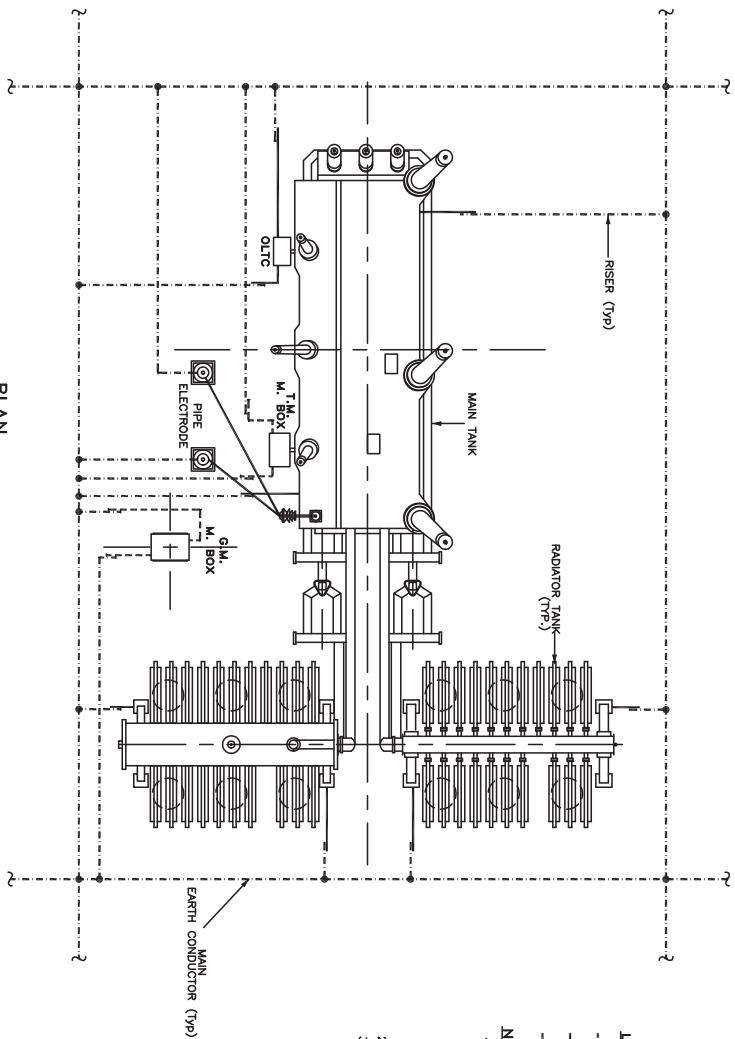


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 6	Rev. 00
		12/11/2007		

EARTHING OF TRANSFORMER/ REACTOR



LEGEND	
-----	40mm $\phi$ 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.
  - O.L.T.C. - 2 Nos. (O.T 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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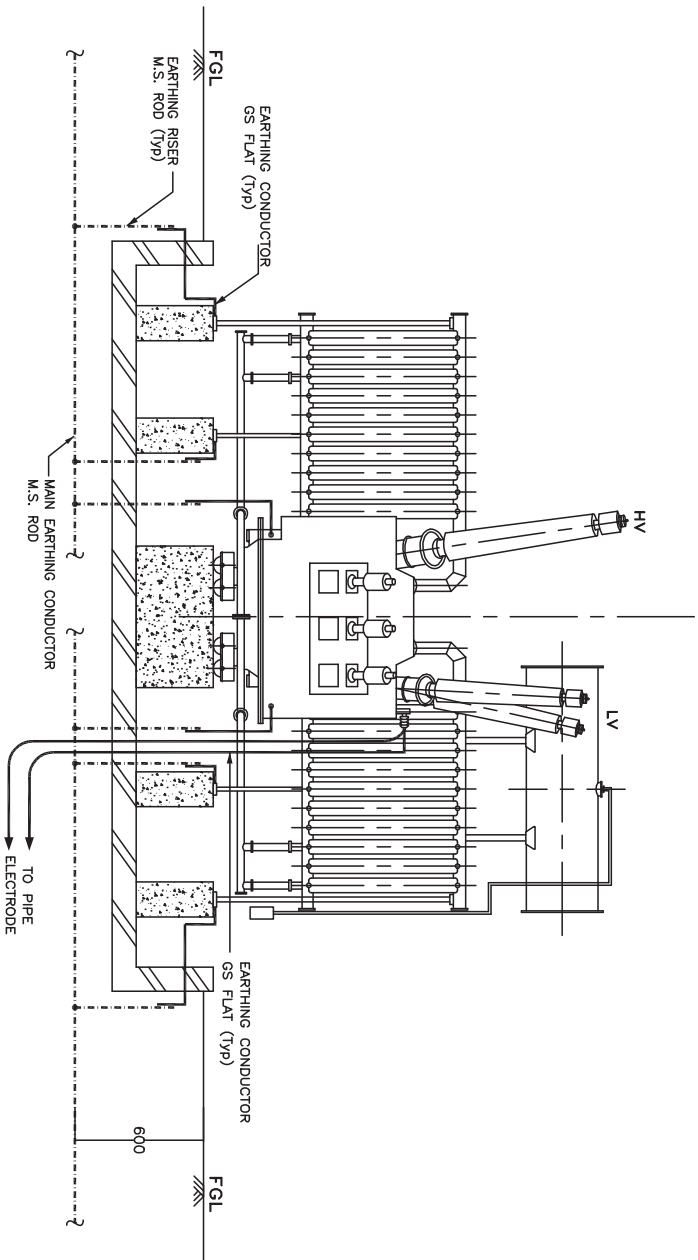
PROJECT :- STANDARD

TITLE:- STANDARD EARTHING DETAILS

2007/04/01	2007/04/01	12/11/2007	Drawing No.:	Rev.
CKD BY	PRPD BY	Date	C/ENG/STD/EARTHING	00
			SHEET # 7	



EARTHING OF TRANSFORMER / REACTOR



LEGEND

- 40mm $\phi$  MS ROD
- 75 x 12 mm GS FLAT
- 50 x 6 mm GS FLAT

END VIEW

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PROJECT :- STANDARD

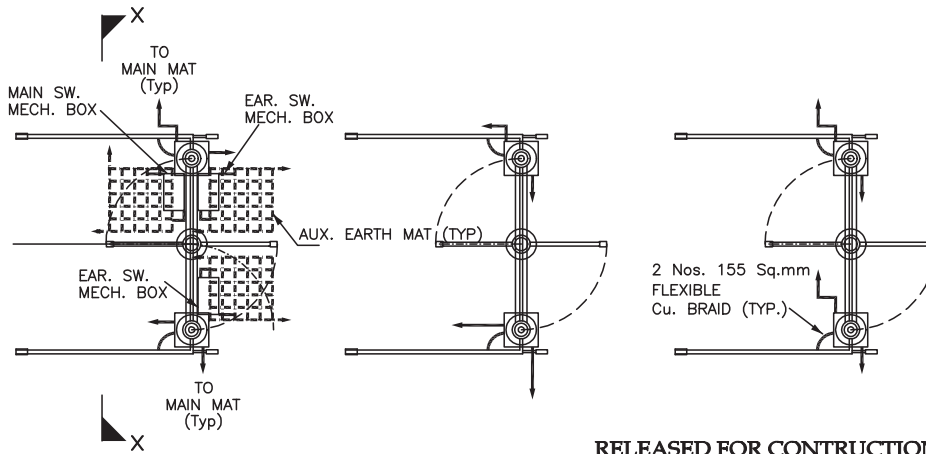
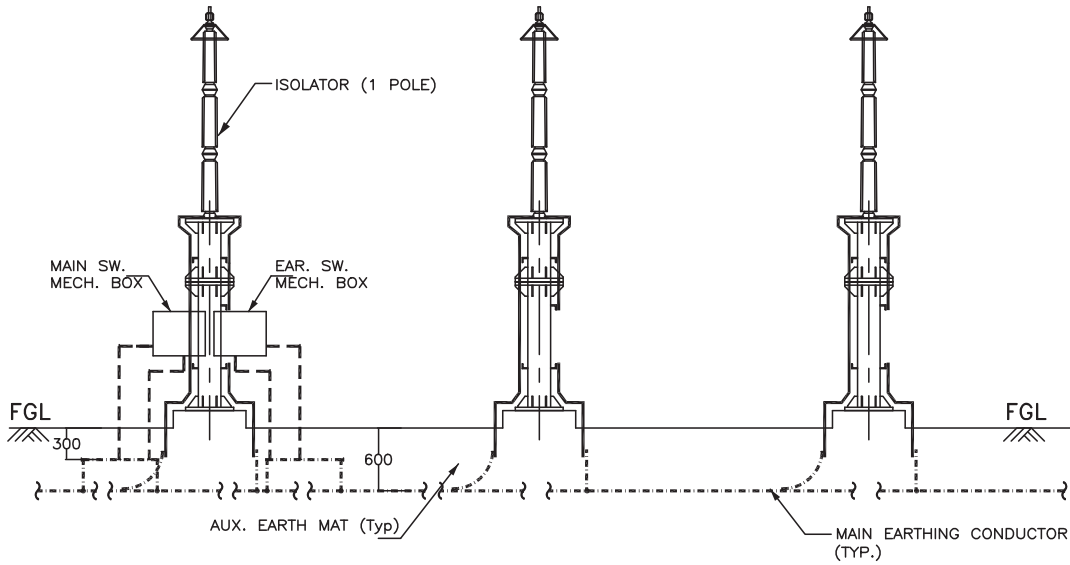
TITLE:- STANDARD EARTHING DETAILS

CND BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHING SHEET # 8	Rev. 00
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## EARTHING OF ISOLATOR



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OF INDIA LIMITED**  
(A Government of India Enterprise)

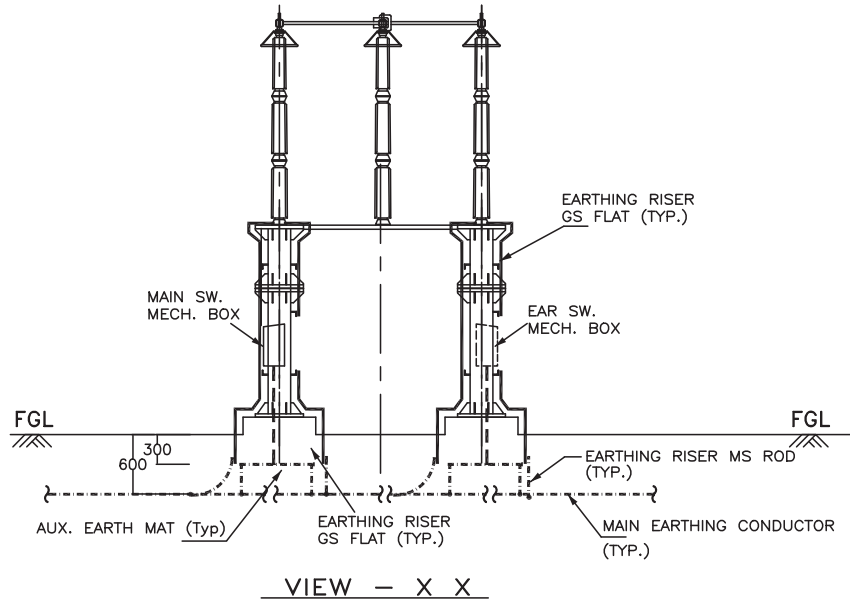


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

CKD BY	PRPD BY	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 10	Rev. 00
		Date		

## EARTHING OF ISOLATOR (1 PH)




### LEGEND

	40mm $\phi$ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm GS FLAT

### NOTES :-

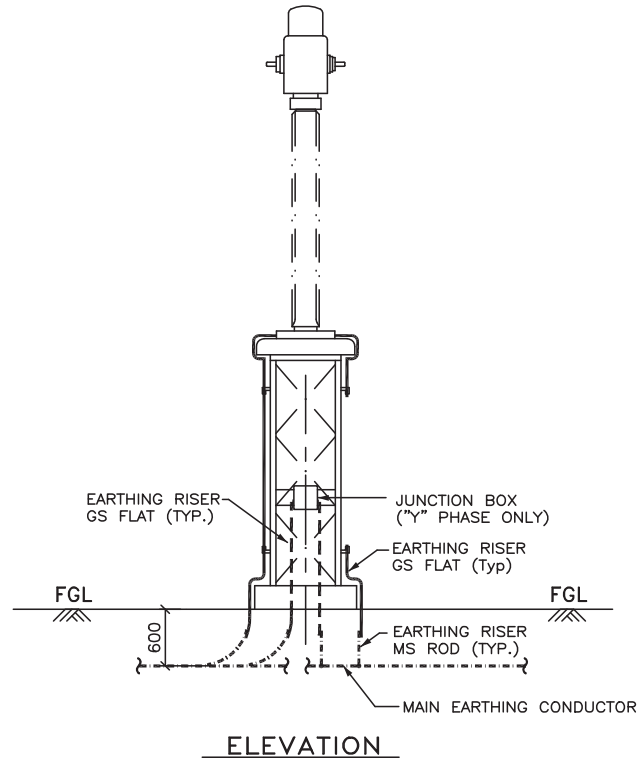
1. No. OF RISERS FOR ISOLATOR = 4 Nos. / PHASE.
2. No. OF RISERS FOR MAIN MECH. BOX = 2 Nos.
3. No. OF RISERS FOR EARTH SW. MECH. BOX = 2 Nos. / BOX.
4. No. OF AUXILIARY EARTH MAT = 1 Nos. FOR EACH MB
5. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.
6. NO. OF AUX. EARTHMAT IS INDICATIVE ONLY. IT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

**RELEASED FOR CONTRUCTION**




<div>POWER GRID CORPORATION OF INDIA LIMITED</div> <div>( A Government of India Enterprise )</div>			<div></div> <div>पावरग्रिड</div>
PROJECT :-     STANDARD			
TITLE:-     STANDARD EARTHING DETAILS			
<div>SKP CKD BY</div>	<div>SKP PRPD BY</div>	<div>12/11/2007</div> <div>Date</div>	<div>Drawing No.:</div> <div>C/ENG/STD/EARTHINGS</div> <div>SHEET # 11</div>
			<div>Rev.</div> <div>00</div>



## EARTHING OF CURRENT TRANSFORMER (1 PH)



### LEGEND

	40mm $\phi$ 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.

**RELEASED FOR CONTRUCTION**

**POWER GRID CORPORATION  
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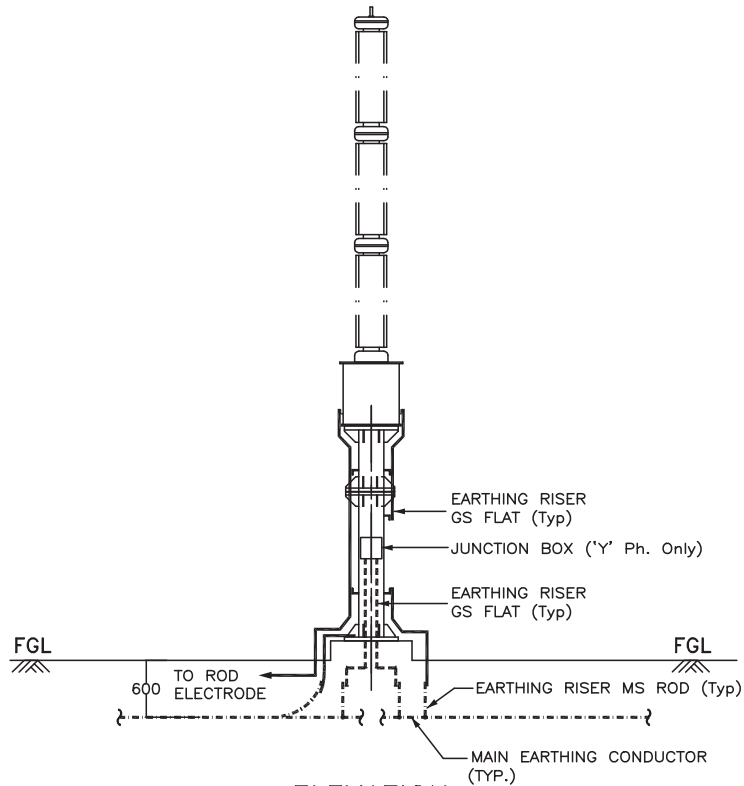


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP/Prashar</i>	<i>SKP/Prashar</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
CKD BY	PRPD BY	Date	SHEET # 12	00

## EARTHING OF CAPACITIVE VOLTAGE TRANSFORMER (1 PH)



### LEGEND

— · — · —	40mm $\phi$ 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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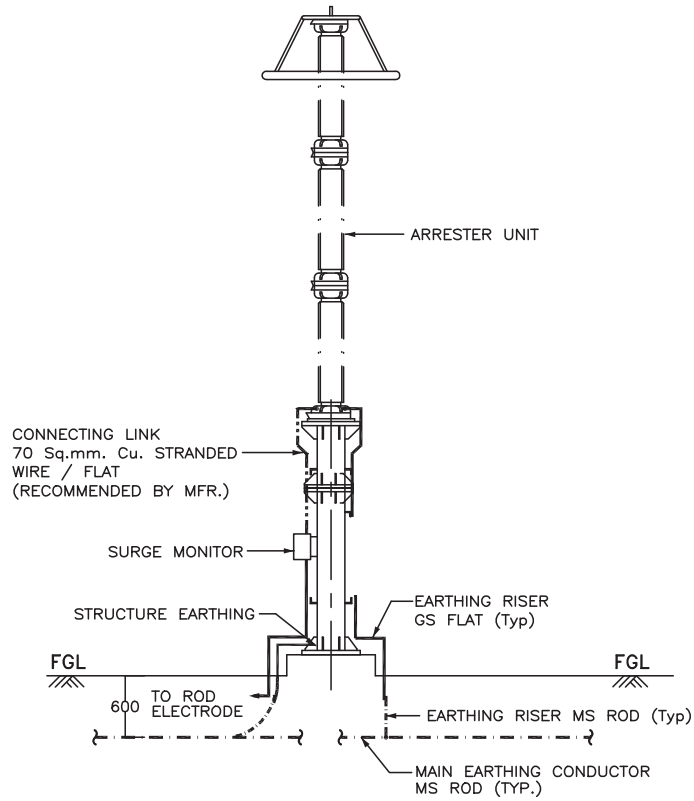
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>AKP</i>	<i>AKP</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
CKD BY	PRPD BY	Date	SHEET # 13	00



## EARTHING OF SURGE ARRESTER (1PH)



ELEVATION

### LEGEND

- · — · — · — 40mm $\phi$  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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**POWER GRID CORPORATION  
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( A Government of India Enterprise )

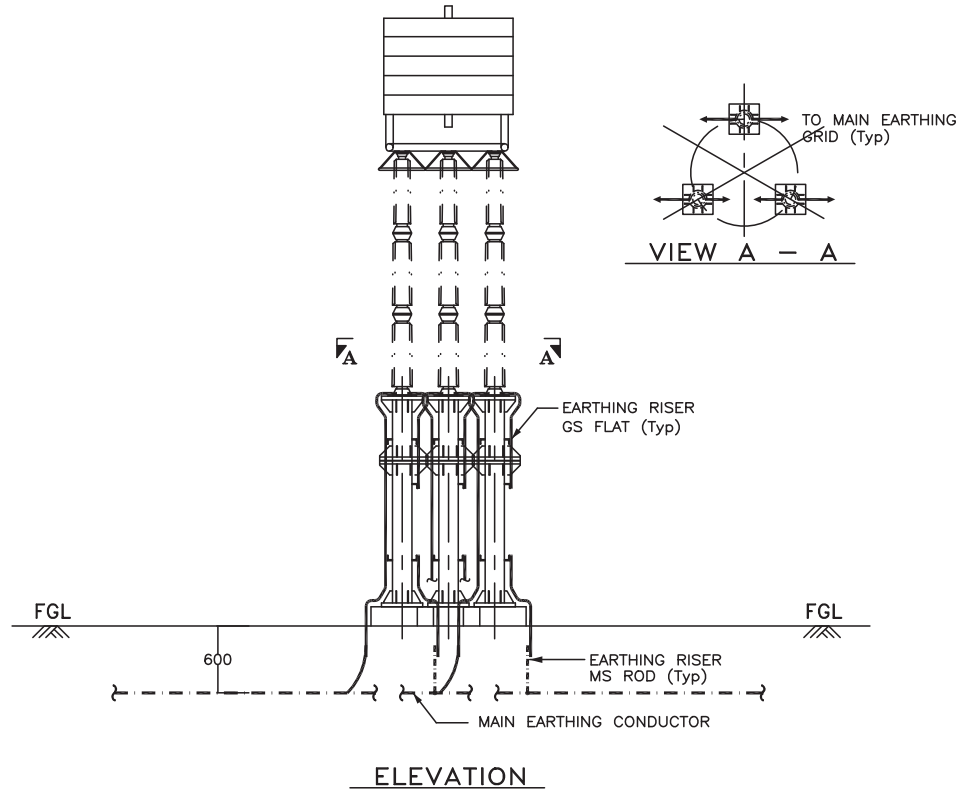


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP/Prabhu</i>	<i>SKP/Prabhu</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 14	Rev. 00
CKD BY	PRPD BY	Date		

## EARTHING OF WAVE TRAP (1PH)



### LEGEND

- · — · — · — 40mm $\phi$  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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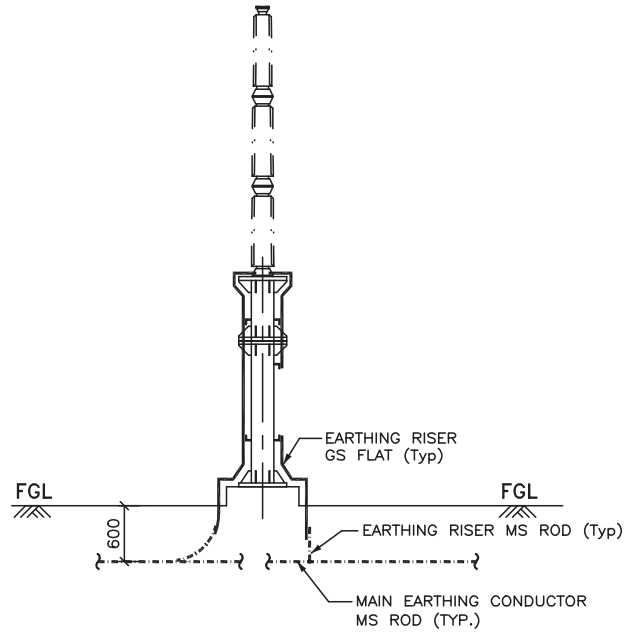
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKPankar</i>	<i>SKPankar</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
CKD BY	PRPD BY	Date	SHEET # 15	00



## EARTHING OF POST INSULATOR (1PH)



ELEVATION

### LEGEND

	40mm $\phi$ 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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(A Government of India Enterprise)

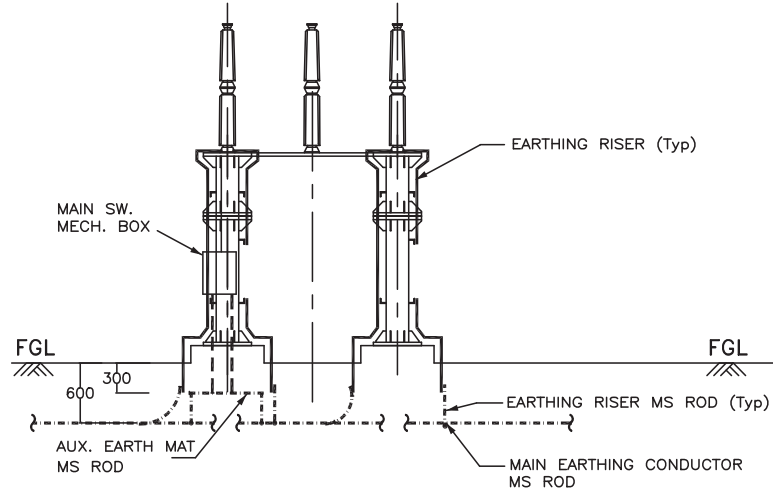


PROJECT :- STANDARD

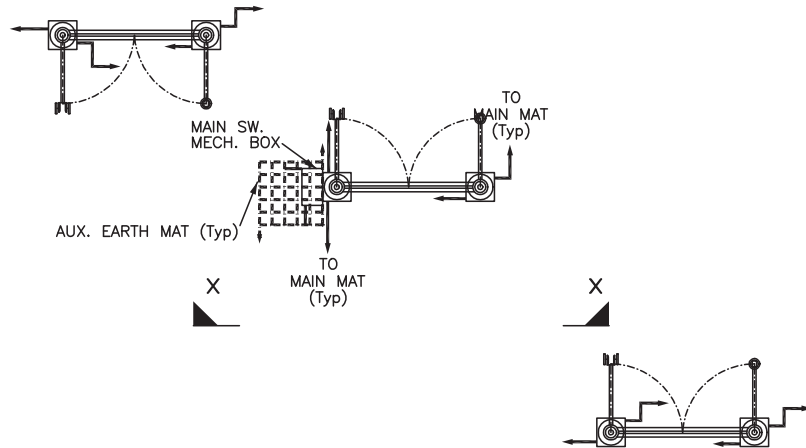
TITLE:- STANDARD EARTHING DETAILS

<i>SKP</i>	<i>SKP</i>	12/11/2007	Drawing No.:	Rev.
CKD BY	PRPD BY	Date	C/ENG/STD/EARTHINGS	00
			SHEET # 16	

## TANDEM ISOLATOR



VIEW - X X



PLAN

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पावरग्रिड

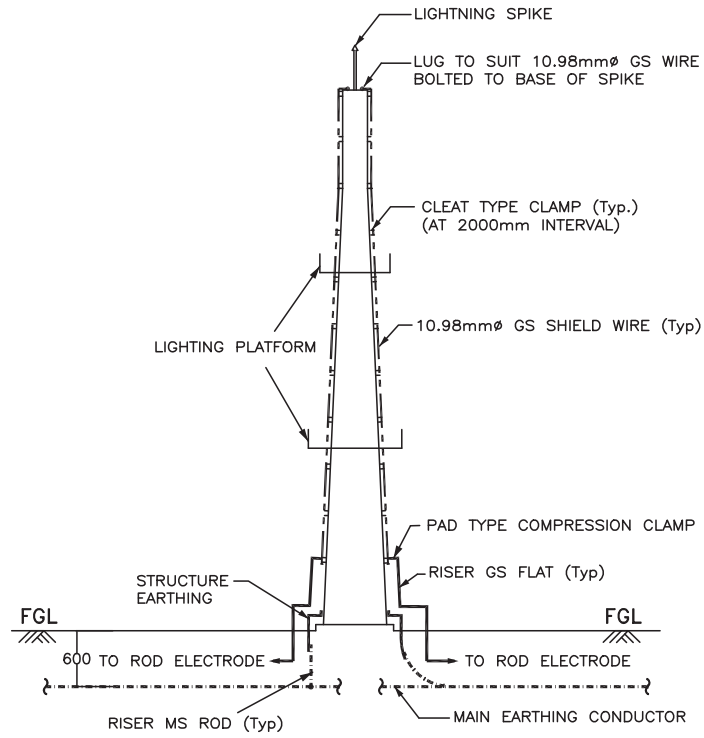
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 17	Rev. 00
SK/Arkar	SK/Arkar	12/11/2007		



## EARTHING OF LIGHTNING MAST



### NOTES :-

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

### LEGEND

- · — · — · — 40mm $\phi$  MS ROD  
 ————— 75 x 12 mm GS FLAT

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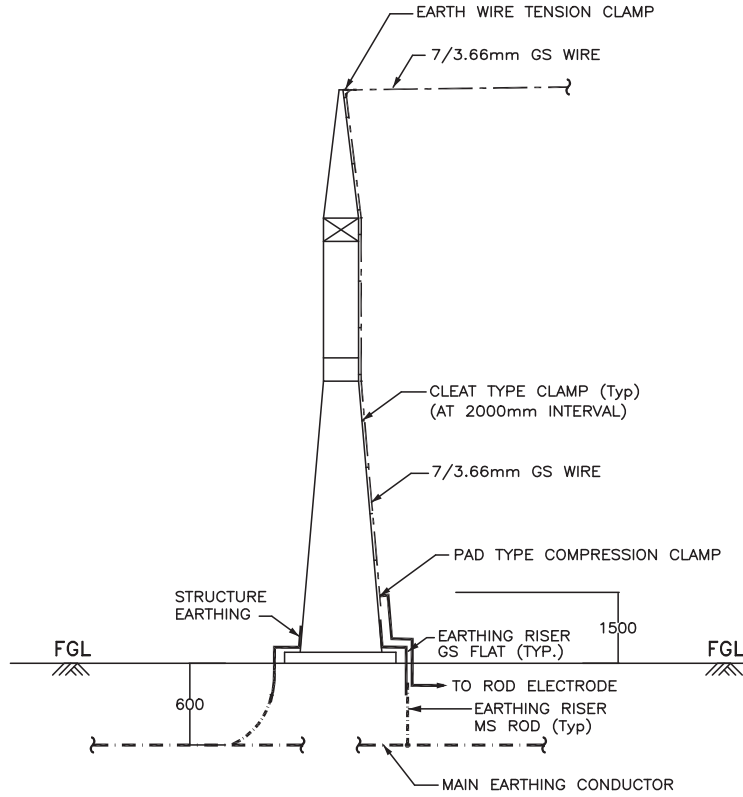


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP</i>	<i>SKP</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
CKD BY	PRPD BY	Date	SHEET # 18	00

## 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 $\phi$  MS ROD
- 75 x 12 mm GS FLAT

**RELEASED FOR CONTRUCTION**

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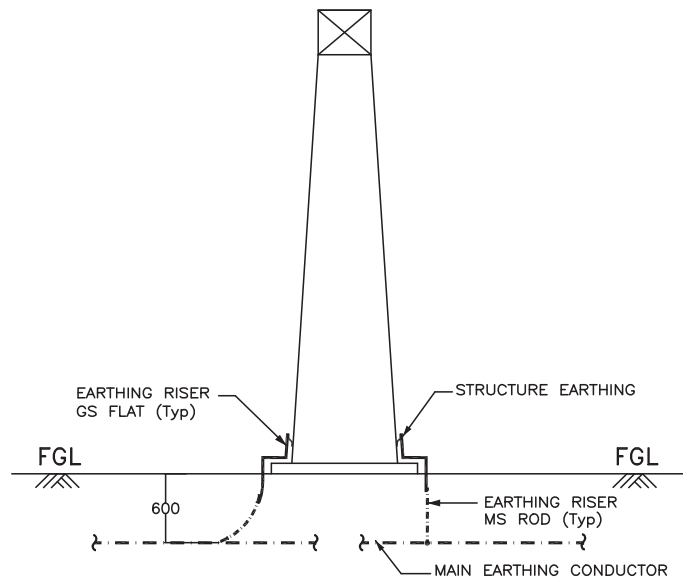


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

CKD BY	PRPD BY	Date	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 19	Rev. 00
CKD BY	PRPD BY	Date		

## EARTHING OF TOWER WITHOUT PEAK



### ELEVATION

#### LEGEND

- · — · — · — 40mm $\varnothing$  MS ROD
- 75 x 12 mm GS FLAT

#### NOTES :-

1. No. OF RISERS = 2 Nos.

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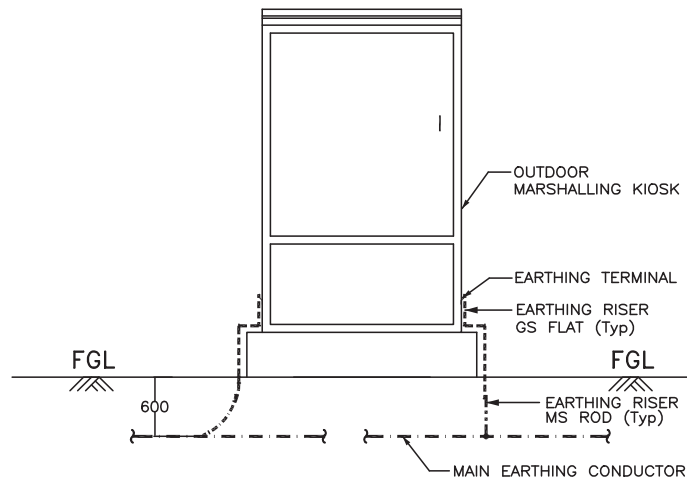
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP</i>	<i>SKP</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 20	Rev. 00
CKD BY	PRPD BY	Date		



## EARTHING OF BAY MARSHALLING BOX



### ELEVATION

#### LEGEND

— · — · — · —	40mm $\phi$ 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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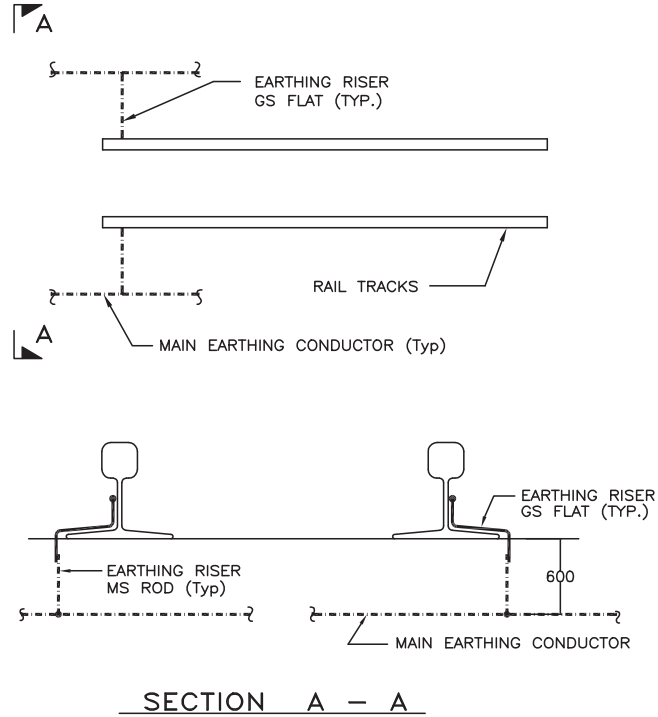


**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP/Prakash</i>	<i>SKP/Prakash</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 21	Rev. 00
CKD BY	PRPD BY	Date		

## EARTHING OF RAIL TRACK



### LEGEND

	40mm $\varnothing$ 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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OF INDIA LIMITED  
( A Government of India Enterprise )

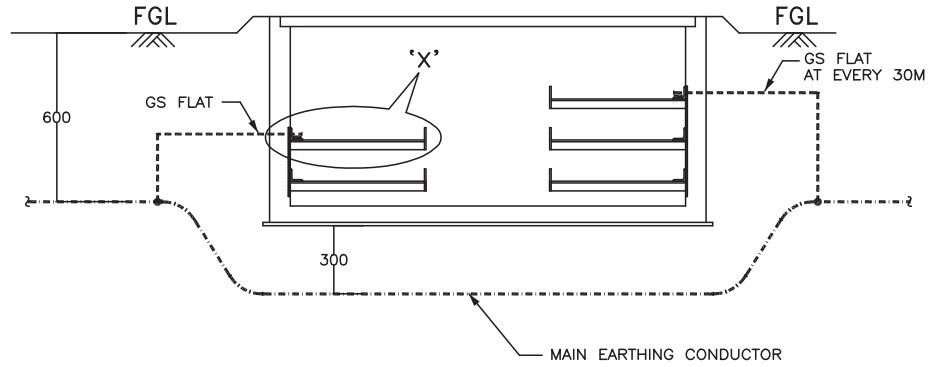


PROJECT :- STANDARD

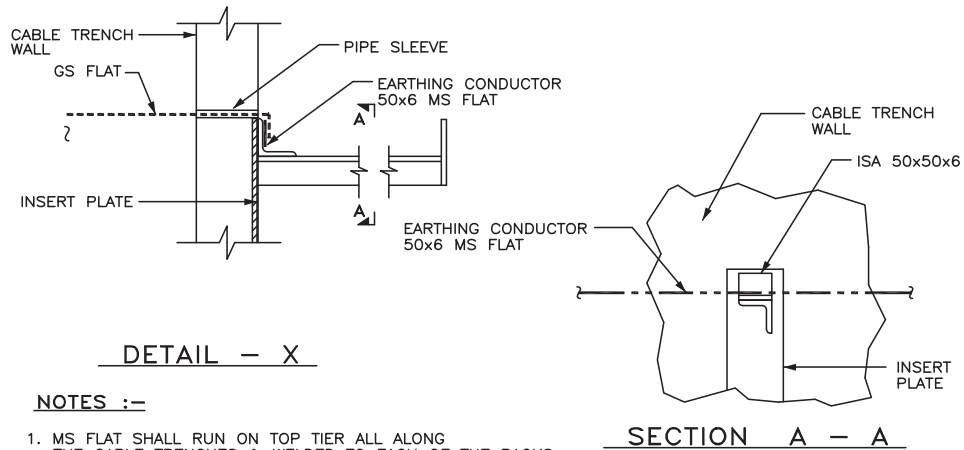
TITLE:- STANDARD EARTHING DETAILS

<i>SKP</i>	<i>SKP</i>	12/11/2007	Drawing No.:	Rev.
CKD BY	PRPD BY	Date	C/ENG/STD/EARTHINGS	00
			SHEET # 22	

## EARTHING OF CABLE TRENCH



### TYPICAL CROSS SECTION OF CABLE TRENCH



#### 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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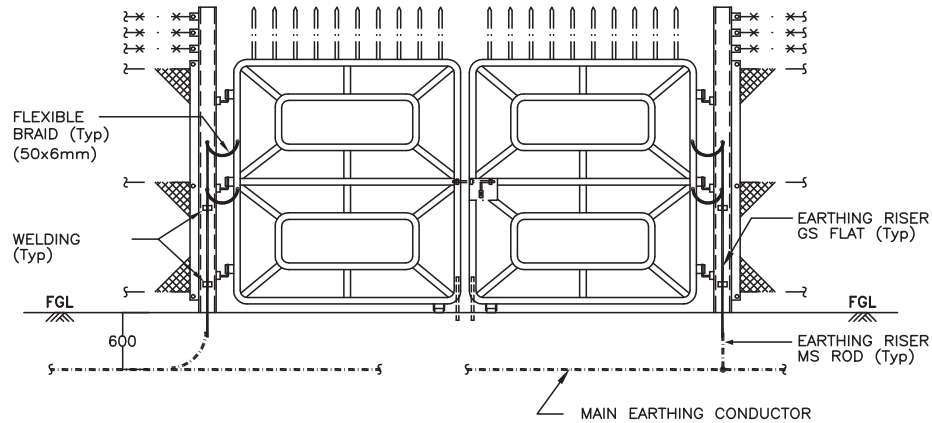
**PROJECT :- STANDARD**

**TITLE:- STANDARD EARTHING DETAILS**

<i>NDK/Parthiv</i>	<i>NDK/Parthiv</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
CKD BY	PRPD BY	Date	SHEET # 23	00



## EARTHING OF GATES & FENCE



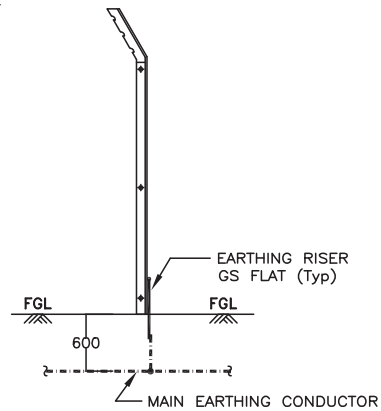
### MAIN GATE

#### LEGEND

— · — · — · —	40mm $\phi$ 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 SHALL BE CONNECTED TO EARTHING GRID.		
4. EVERY ALTERNATE FENCE SHALL BE CONNECTED TO EARTHING GRID.		



### FENCE POST (ALTERNATE FENCE POST)

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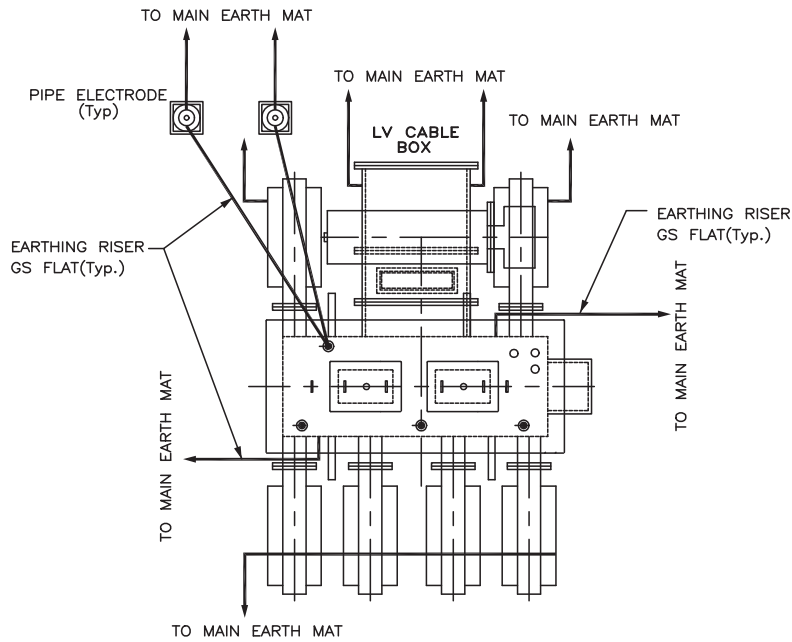


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CKD BY	PRPD BY	Date	SHEET # 24	

## EARTHING OF LT TRANSFORMER



### PLAN

#### LEGEND

	40mm $\phi$ MS ROD
	75 x 12 mm GS FLAT
	50 x 6 mm GS FLAT

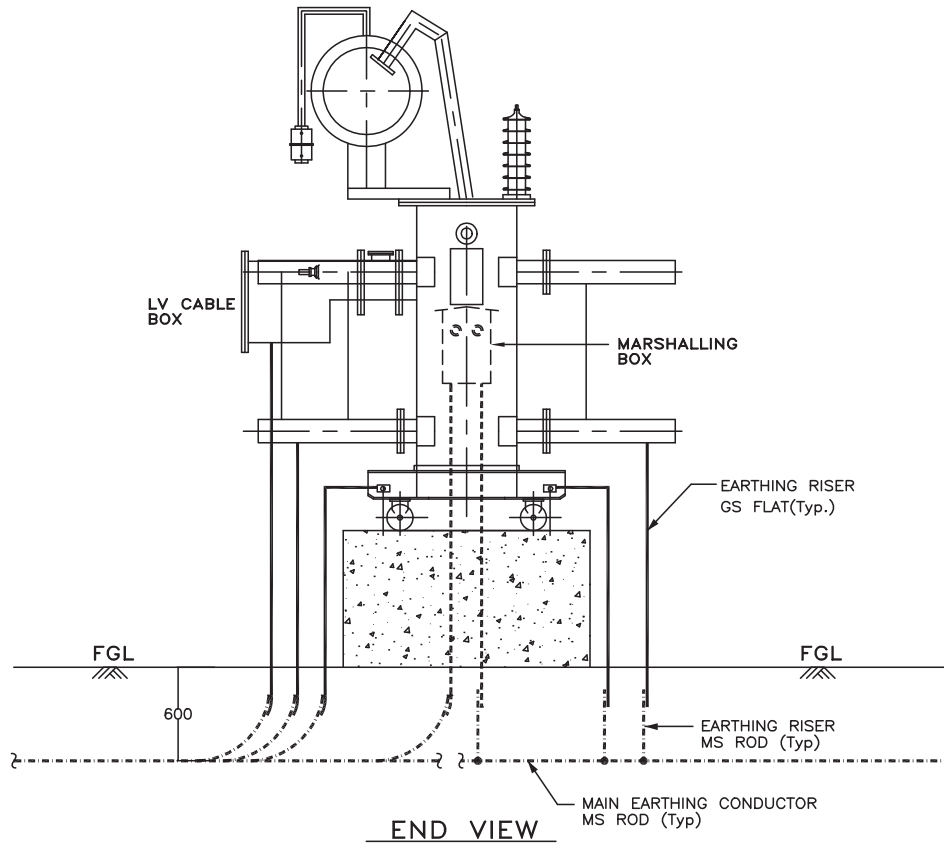
#### NOTES :-

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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<b>TITLE:- STANDARD EARTHING DETAILS</b>			
<i>SK/Prashar</i>	<i>SK/Prashar</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS SHEET # 25
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## EARTHING OF LT TRANSFORMER



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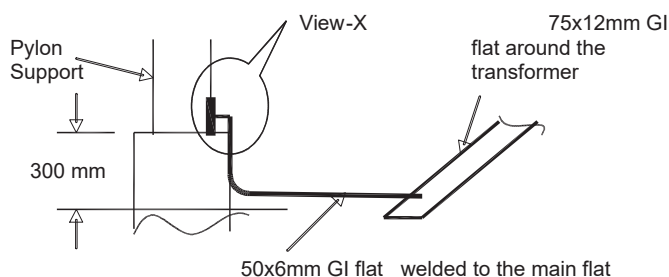
**TITLE:- STANDARD EARTHING DETAILS**

<i>SKP</i>	<i>SKP</i>	12/11/2007	Drawing No.: C/ENG/STD/EARTHINGS	Rev.
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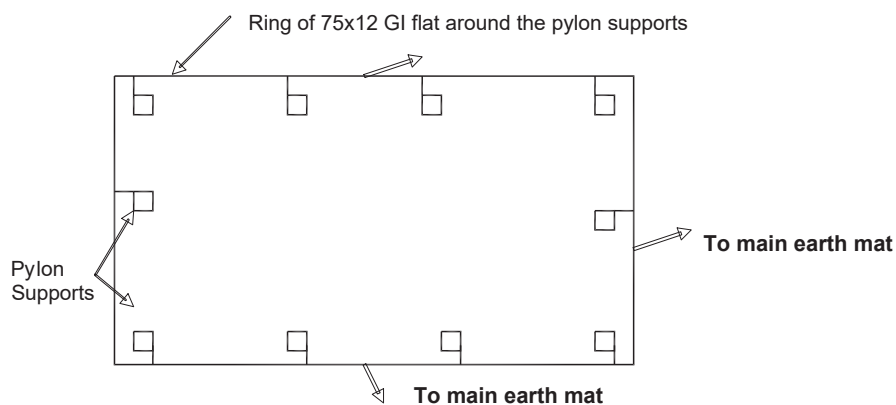


## EARTHING OF PYLON SUPPORTS

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)**



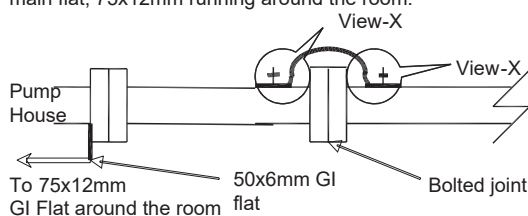
**Fig.- Layout (Earthing of Pylon Supports)**

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### EARTHING OF HYDRANT/ HVW SPRAY PIPING

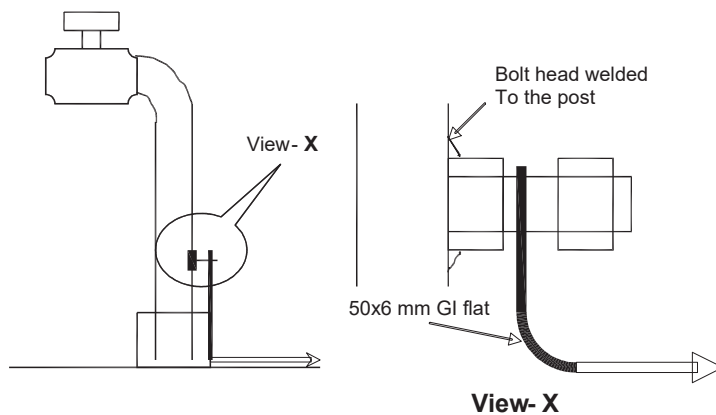
These pipes shall be grounded at pump house through 50x6mm GI flat connected to the main flat, 75x12mm running around the room.



**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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