

# Annexure-D

## 400 kV - Equipment Earthing Drawing (for reference in Udangudi project)

REV.	DATE	ALTERED	TTR	REV.	DATE	ALTERED	TTR	REV.	DATE	ALTERED	TTR
02	21.06.2013	CHECKED	SS	03	16.06.2014	CHECKED	SKS	04	21.08.2014	CHECKED	SKS
		APPD	AG			APPD	AKDAS			APPD	AKDAS
Revised as per PGCIL comments vide letter C/ENGG/HVDC/NER-NR/257 -AG/389 dated 22.05.2012				Revised to submit new equipment earthing details & as per POWERGRID mail date 17-01-2014				Revised to submit new equipment earthing details & as per POWERGRID Site letter date 28-03-2014			
JOB No.											
07	21.03.2015	CHECKED	SS	06	05.01.2015	CHECKED	SS	05	14.11.2014	CHECKED	SS/SKS
		APPD	SKS			APPD	SKS			APPD	AKDAS
Revised to submit new drawing				Revised to submit new drawing				Revised to include additional details and particular to this project			

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
1A	NOTES	14B	AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S MECH. BOX-Z2.
02.	400/220/72.5KV SF6 CIRCUIT BREAKER	15.	SWITCHGEAR / MCC
02A.	400/220/72.5KV SF6 CIRCUIT BREAKER	16.	400/220KV WAVE TRAP
03.	400/220KV CVT	17.	FENCE POST
3A.	66KV PT	18.	TYPICAL ARRANGEMENT OF EQUIPMENT EARTHING WITH MAIN GRID
04.	400/220/72.5KV POST INSULATOR (SOLID CORE TYPE)	19.	WELDING DETAILS
4A.	400/72.5KV POST INSULATOR ON TOP OF FIRE WALL FOR CONVERTER TRANSFORMER	20.	WELDING DETAILS
05.	400/220/33 KV CLASS ARRESTER	21.	WELDING DETAILS
5A.	333/9 KV ARRESTER ON TOP OF FIRE WALL FOR CONVERTER TRANSFORMER	22.	CNG SET (TYP.)
5B.	333KV ARRESTER & LV CT ON TOP OF FIRE WALL FOR YY TYPE CONVERTER TRANSFORMER	23.	SHUNT REACTOR
06.	MARSHALLING KIOSK	23A.	NEUTRAL GROUNDING RECTOR
07.	400/220/72.5KV DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH	24.	AC FILTER HV CAPACITOR
7A.	400/220KV DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCH	24A.	AC FILTER LV CAPACITOR
7B.	400/220/72.5KV DOUBLE BREAK ISOLATOR WITHOUT EARTH SWITCH	25.	AC FILTER HP12, HP12B, HP24/36LOWER, HP24/36B REACTOR
7C.	EARTH SWITCH	25A.	AC HP3 FILTER REACTOR
08.	SHIELD WIRE TOWER	25B.	AC HP24/36 UPPER REACTOR
08A.	TOWER WITHOUT PEAK	26.	HP12 HP12B, HP3 AC FILTER RESISTOR
09.	400/220/72.5KV CURRENT TRANSFORMER	26A.	HP24/36, HP24/36B AC FILTER RESISTORS
10.	CABLE TRENCH	27.	HP 24/36, HP 24/36B LOWER ARRESTER
11.	DETAIL OF PIPE EARTH ELECTRODE IN TREATED EARTH PIT (ET)	28.	HP3 ARRESTER & CONNECTED CT
11A.	ROD EARTH ELECTRODE WITH EARTH PIT		
11B.	ROD EARTH ELECTRODE WITHOUT EARTH PIT		
12.	RAIL BONDING		
13.	AUTO TRANSFORMER		
13A.	LT TRANSFORMER		
14.	AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S MECH. BOX.		
14A.	AUXILIARY EARTH MAT FOR ISOLATOR MAIN MECH.,E/S MECH. BOX-Z5.		

**POWER GRID CORPORATION OF INDIA**  
NER/ER - NR / WR Interconnector I

± 800KV 6000MW HVDC Multi Terminal

Checked by: *[Signature]* Verified: *[Signature]* Reviewed: *[Signature]*

CA NO. C-61901R-S056-8/CA-IV/3662 DATED 22.12.2011 FOR ON-SHORE SUPPLIES & SERVICES

AS-BUILT  
(No Change)

W.O.NO.	80014	CUSTOMER	POWER GRID CORPORATION OF INDIA LTD.
STATUS		PROJECT	±800KV, 6000MW, HVDC MULTI-TERMINAL NER/ER - NR/WR INTERCONNECTOR-I PROJECT

REV.	DATE	ALTD	CHD	APPD	Station
01	07.1.2012	TTR	SS	AG	Agra




REV.	DATE	ALTD	CHD	APPD	TITLE
					EQUIPMENT & STRUCTURE EARTHING DETAILS

DEPT.	SCALE	DRAWING NO.
DEPT.	SCALE	TB-4-343-316-131
SIGN		
DATE		

SHEET	1	REV.	07

COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in anyway detrimental to the interest of the company.	REV. 02	DATE 21.06.2013	ALTERED	TTR	REV. 03	DATE 16.06.2014	ALTERED	TTR	REV. 04	DATE 21.08.2014	ALTERED	TTR																																																																																																															
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**AS-BUILT**  
**(No Change)**

BHEL RELEASED	
FOR	
CONSTRUCTION	
DESTROY EARLIER PRINTS	
SIGNED <i>P. T. Reddy</i>	DATE <i>8/10/13</i>
Transmission Projects Engineering Management	

**NOTES:-**

- GROUNDING CONDUCTOR ALONG THEIR RUN ON CABLE TRENCH, LADDER COLUMNS, BEAM, WALL, ETC. SHALL BE CLEATED/CLAMPED AT INTERVALS OF 750mm.
- EARTH STRIPS TO BE LAID FLAT ALONG THE STRUCTURE AS FAR AS POSSIBLE.
- GROUND CONNECTION TO GROUNDING PADS OF EQUIPMENT SHALL BE BOLTED TYPE AND JOINT FACES SHALL GALVANIZED
- THE SURFACES TO BE WELDED SHALL BE CLEANED OF DIRT, OIL, GREASE AND OXIDES BEFORE WELDING.
- ANY OXIDE FILMS THAT MAY HAVE FORMED DURING WELDING MUST BE REMOVED FROM THE WELDED JOINT.
- EARTHING CONDUCTOR FOR EQUIPMENT AND TOWER EARTHING SHALL BE OF GALVANISED M.S. OF SIZE 75x12 mm. THE CONDUCTOR BELOW THE GROUND LEVEL SHALL BE 40 mm DIA MS ROD.
- IN THE ATTACHED DRAWINGS GL REPRESENTS GROUND LEVEL.
- ALL THE EQUIPMENTS/ STRUCTURES SHALL BE EARTHED AT TWO POINTS WITH 75x12 mm G.S. FLAT EVEN THOUGH THEY ARE SHOWN OR NOT IN THE DRAWING DUE TO CLARITY.
- ALL JUNCTION BOXES, OPERATING MECHANISM BOXES AND MARSHALLING KIOSKS, GROUND MOUNTED CONTROL CABINETS ETC SHALL BE EARTHED AT TWO POINTS WITH 50x6mm G.S. FLAT
- ALL WELDED JOINTS ABOVE GROUND LEVEL SHALL BE COATED WITH 2 COATS OF RED OXIDE AND FOLLOWED BY TWO COATS OF GALVOSEAL (COLD GALVANISING) PAINT AND UNDERGROUND WELDED JOINTS SHALL BE COATED WITH TWO COATS OF RED OXIDE PAINT FOLLOWED BY TWO COATS OF BITUMEN COMPOUND.
- FOR WELDED JOINTS LOW HYDROGEN CONTENT ELECTRODES SHALL BE USED.
- EARTHING CONDUCTORS FROM EQUIPMENT STRUCTURES SHALL BE CONNECTED TO THE NEAREST POSSIBLE EARTH MAT RISER. EQUIPMENT EARTHING SHALL BE AS PER IS 3043.
- FOR ISOLATOR OPERATING BOX, AUXILIARY MESH SHALL BE 1500X1500 mm WITH 300mm SUBCONDUCTOR SPACING. SUBCONDUCTOR SHALL BE 40 mm DIA M.S. ROD.
- ALL JOINTS BETWEEN 40 DIA M.S. ROD AND G.S. FLAT SHALL BE BELOW GRAVEL LEVEL.
- 40# GI PIPE ELECTRODE SHALL BE USED IN TREATED EARTH PIT.
- BENDING OF LARGE DIAMETER ROD/THICK CONDUCTOR SHALL BE DONE PREFERABLY BY GAS HEATING.
- GROUNDING CONDUCTORS IN OUTDOOR AREAS SHALL BE BURIED 600MM BELOW FINISHED GROUND LEVEL.
- EACH GROUND LEAD FROM THE NEUTRAL OF POWER TRANSFORMER, LT TRANSFORMER, CONVERTER TRANSFORMER, FILTER NEUTRAL, CNG/DG, CVT SHALL BE DIRECTLY CONNECTED TO THE INDIVIDUAL TREATED GROUND PIT ELECTRODE WHICH, IN TURN, SHALL BE CONNECTED TO THE STATION GROUND GRID.
- GROUNDING TERMINAL OF EACH LIGHTNING ARRESTER AND LIGHTNING DOWN CONDUCTORS SHALL BE DIRECTLY CONNECTED TO INDIVIDUAL ROD ELECTRODES WHICH, IN TURN, SHALL BE CONNECTED TO THE STATION GROUND GRID.
- RAILWAY TRACKS WITHIN THE SWITCHYARD AREA SHALL BE BONDED ACROSS FISH PLATES AND CONNECTED TO THE GROUND GRID AT SEVERAL LOCATIONS. AT THE POINT WHERE THE TRACK LEAVES THE PLANT AREA, THE RAIL SECTION SHALL BE PROVIDED WITH INSULATION JOINTS AT BOTH ENDS.
- FLEXIBLE GROUNDING CONNECTORS SHALL BE PROVIDED WHERE FLEXIBLE CONDUITS ARE CONNECTED TO RIGID CONDUITS TO ENSURE CONTINUITY.
- STEEL TO COPPER CONNECTIONS SHALL BE BRAZED TYPE AND SHALL BE TREATED TO PREVENT MOISTURE INGRESSION.
- RESISTANCE OF THE JOINT SHALL NOT BE MORE THAN THE RESISTANCE OF A LENGTH OF CONDUCTOR EQUAL TO THAT OF THE JOINT.

**AS-BUILT**  
**(No Change)**

 <b>पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लि.</b> <b>POWER GRID CORPORATION OF INDIA LTD.</b>			
<b>± 800kV 6000MW HVDC Multi Terminal NER / ER - NR / WR Interconnector I</b>			
Approved in Category :		I	II
		III	IV
Checked by	Verified by	Reviewed by	
Signature: <i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Date: <i>22/05/13</i>			



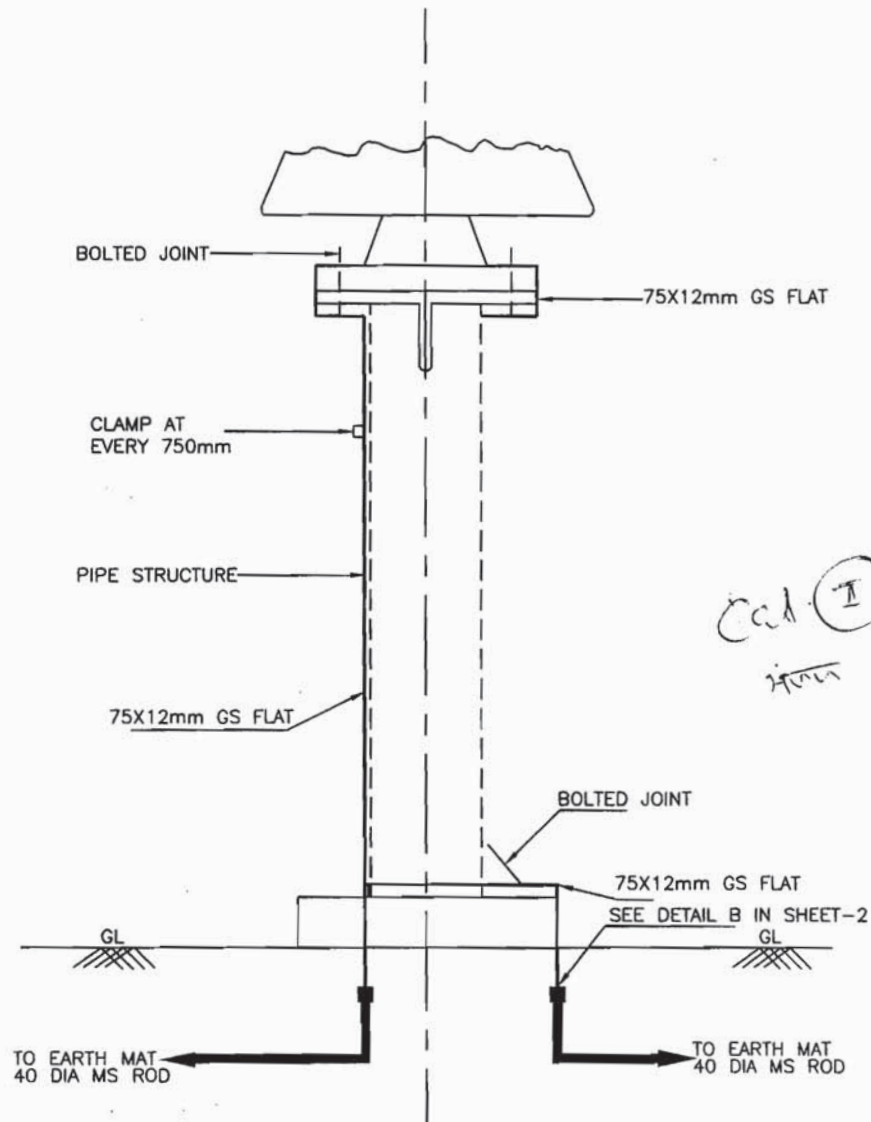
**EQUIPMENT EARTHING DETAILS  
NOTES**

ORG. No.

TB-4-343-316-131

REV. 01

SHEET No.  
1A



**AS-BUILT**  
**(No Change)**



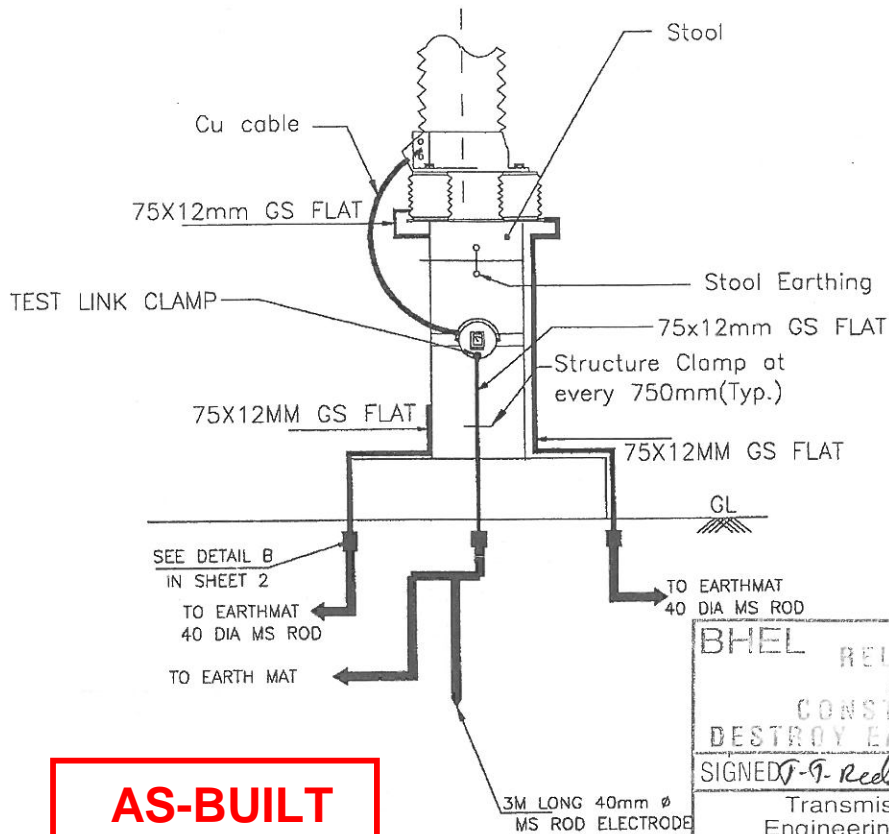
EQUIPMENT EARTHING DETAILS  
400/220/72.5kV POST INSULATOR (SOLID CORE TYPE)

DRG. No. TB-4-343-316-131

REV. 00


SHEET No.  
4





**AS-BUILT  
(No Change)**

BHEL RELEASED FOR CONSTRUCTION DESTROY EARLIER PRINTS  
SIGNED *T. G. Reddy* DATE *08/11/13*  
Transmission Projects Engineering Management

 पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लि. POWER GRID CORPORATION OF INDIA LTD.			
$\pm 800\text{kV } 6000\text{MW HVDC Multi Terminal}$ NER / ER - NR / WR Interconnector I			
Approved in Category :	<input checked="" type="checkbox"/> I	<input type="checkbox"/> II	<input type="checkbox"/> III
Checked by	Verified by	Reviewed by	
Signature: <i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Date :	<i>12/05/13</i>		

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  
400/220/33 kV CLASS ARRESTER

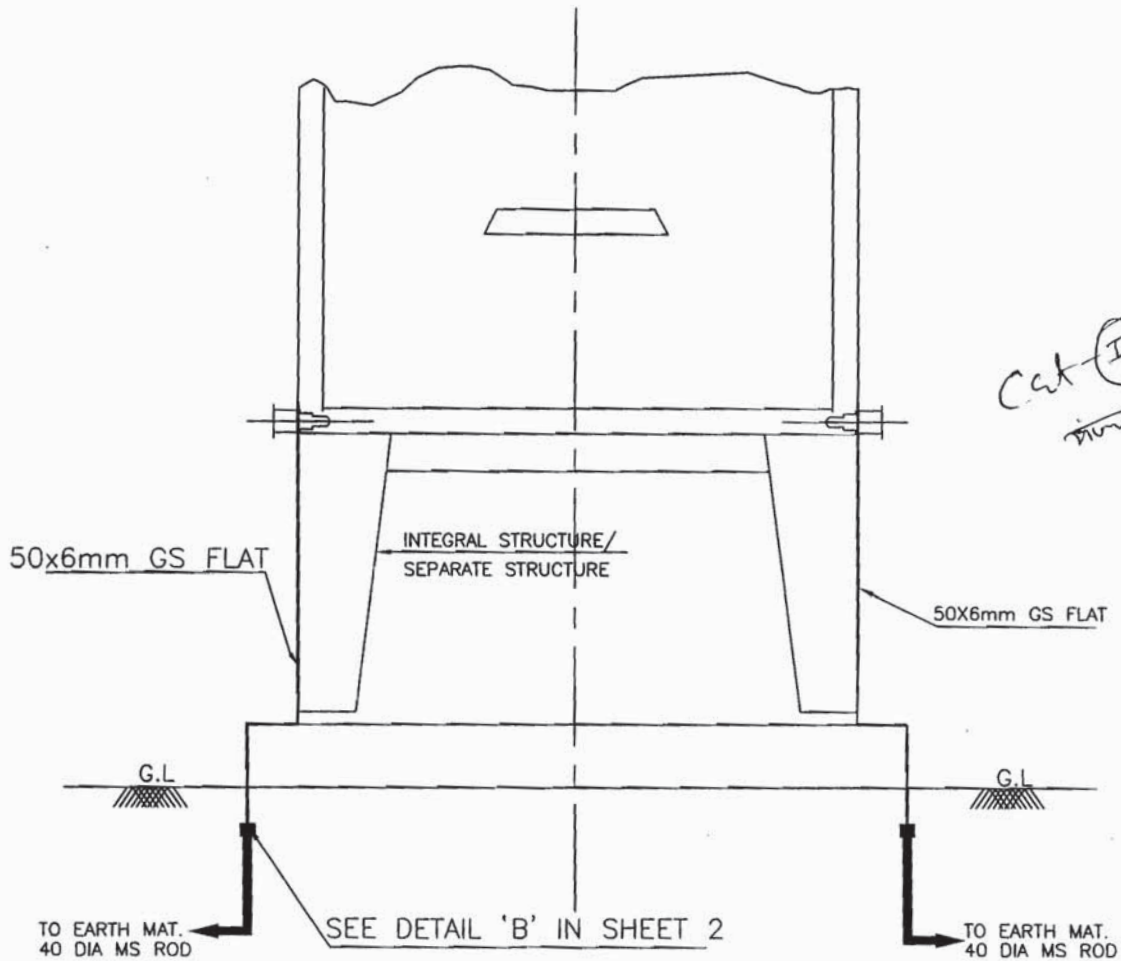
COMPU. DRG. REF.

DRG.NO.

TB-4-343-316-131

REV. 01

SHEET No.  
5



**AS-BUILT**  
**(No Change)**



EQUIPMENT EARTHING DETAILS  
MARSHALLING KIOSK

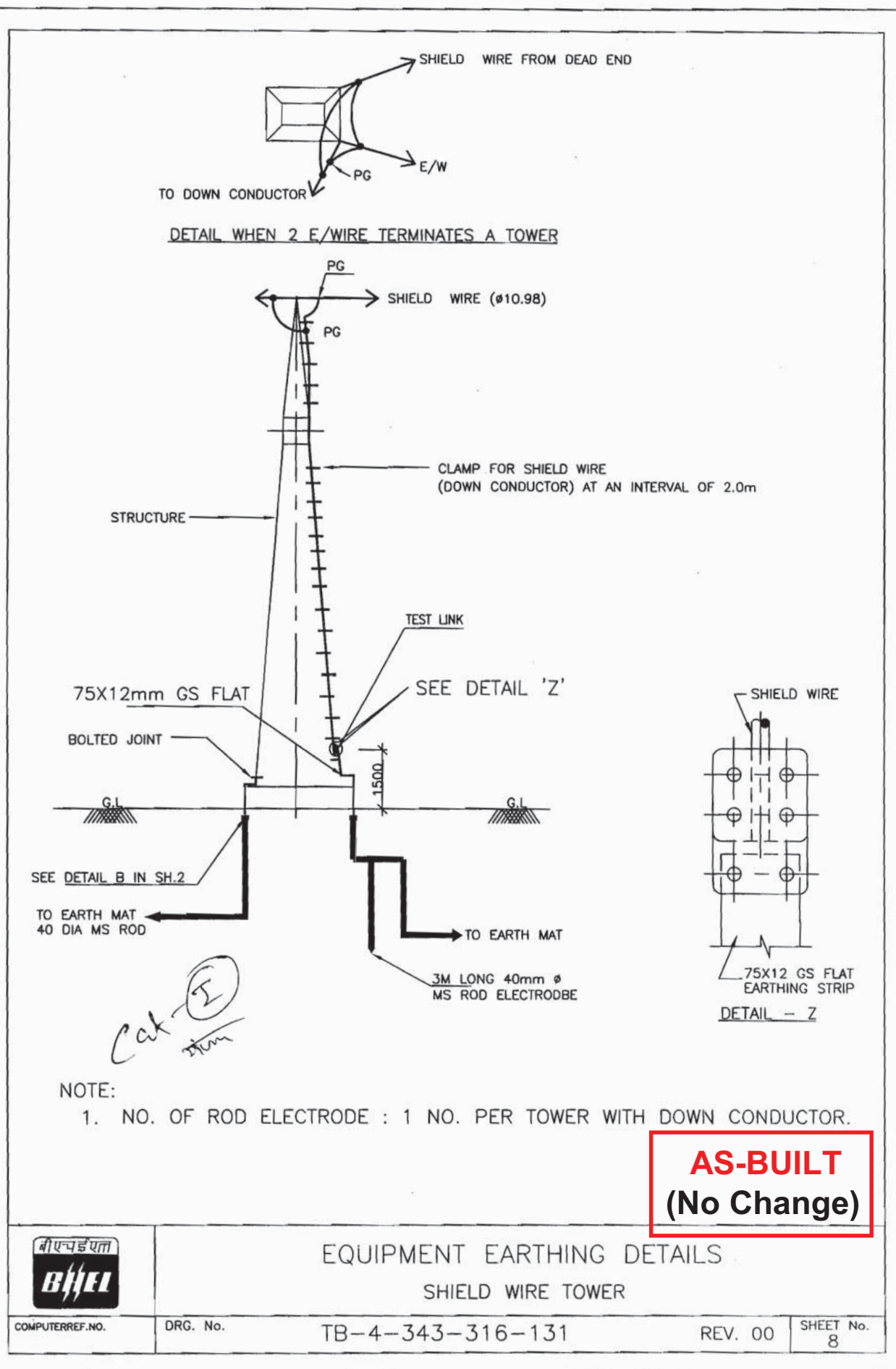
COMPUTER REF. NO.

DRG. No.

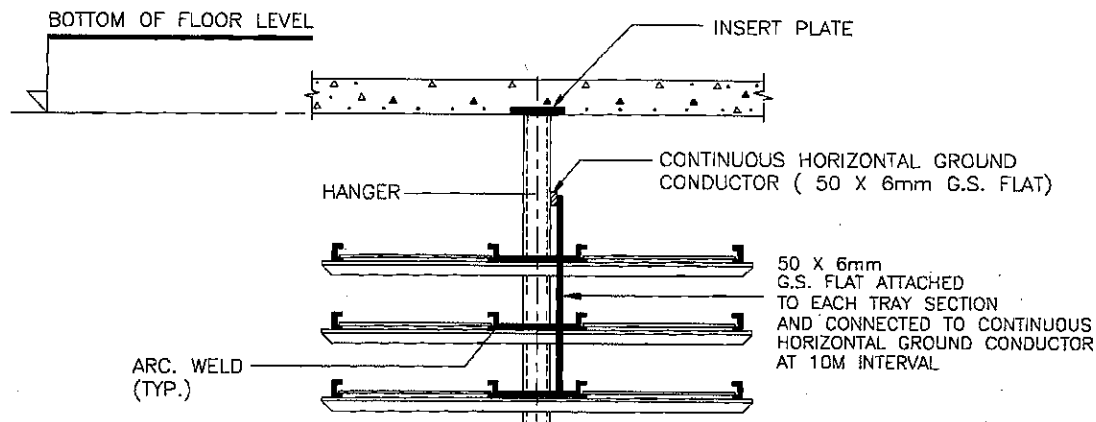
TB-4-343-316-131

REV. 00

SHEET No.  
6



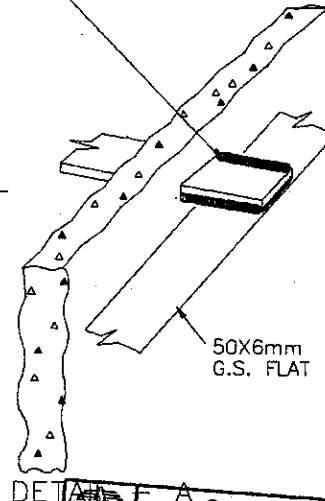
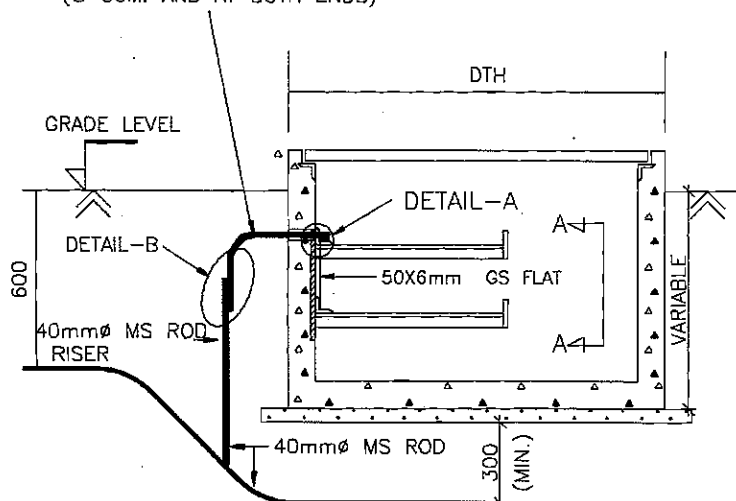




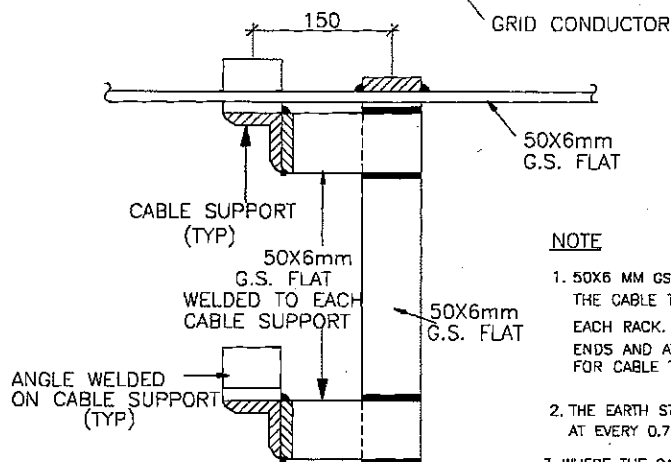
## OVERHEAD CABLE TRAY GROUNDING

50x6mm GS-FLAT FOR  
CABLE TRENCH EARTHING  
(@ 30M. AND AT BOTH ENDS)

PROJECTED PORTION OF  
50x6mm GS FLAT INSIDE  
CABLE TRENCH  
(@ 30M. AND AT BOTH ENDS)



**AS-BUILT  
(No Change)**



VIEW A-A

### NOTE

- 50X6 MM GS FLAT SHALL RUN ON THE TOP TIER ALL ALONG THE CABLE TRENCHES AND THE SAME SHALL BE WELDED TO EACH RACK. FURTHER THIS FLAT SHALL BE EARTHED AT BOTH ENDS AND AT AN INTERVAL OF 30 MTR. FOR TRENCH & 10 MTR FOR CABLE TRAY SECTION.
- THE EARTH STRIP (50X6 MS FLAT) SHALL BE WELDED TO EMBEDDED PLATE AT EVERY 0.75M INTERVAL.
- WHERE THE CABLE RACKS ARE PROVIDED ON BOTH SIDES OF THE TRENCH, BOTH SIDES SHALL BE EARTHED AS PER ABOVE.

<p>पावर ग्रिड कारपोरेशन ऑफ इंडिया लि. POWER GRID CORPORATION OF INDIA LTD.</p>			
<p>± 800 kV 6000 MW HVDC Multi Terminal NER / ER-NR / WR Interconnector I</p>			
<p>Approved in Category: <input checked="" type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV</p>			
Checked by	Verified by	Reviewed by	
Date:	24/11/14		

<p><b>BHEL RELEASED FOR CONSTRUCTION DESTROY EARLIER PRINTS</b></p>	
SIGNED	DATE 14/01/15
<p>Transmission Projects Engineering Management</p>	



## EQUIPMENT EARTHING DETAILS

### CABLE TRENCH

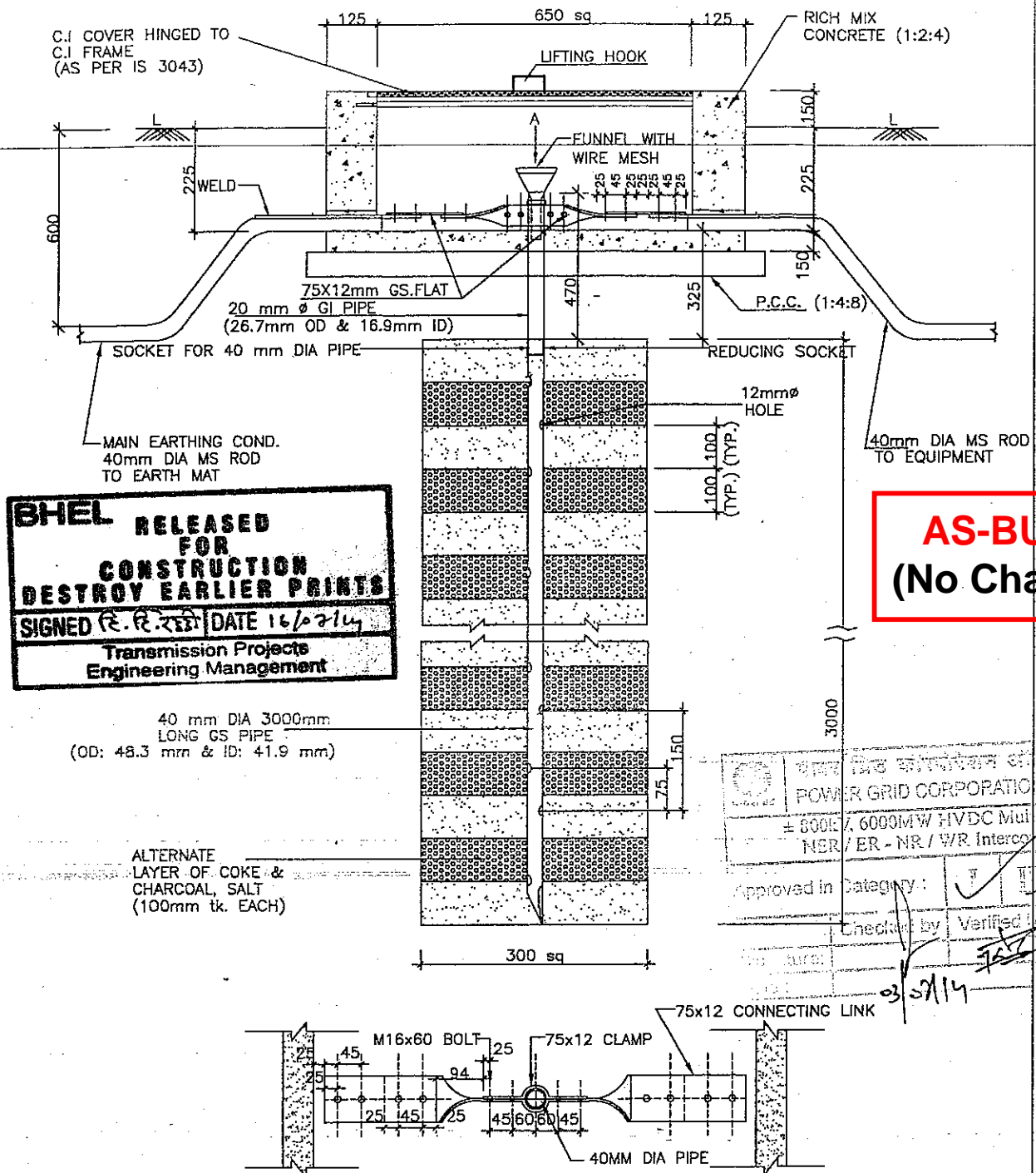
COMPUTERREF.NO.

DRG. No.

TB-4-343-316-131

REV. 01

SHEET No.  
10



**BHEL RELEASED FOR CONSTRUCTION DESTROY EARLIER PRINTS**  
SIGNED (R. R. REDDI) DATE 16/02/14  
Transmission Projects Engineering Management

**AS-BUILT (No Change)**

POWER GRID CORPORATION OF INDIA LTD.			
± 800KV, 6000MW HVDC Multi Terminal NER / ER - NR / W/R Interconnector I			
Approved in Category :	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Checked by	Verified by	Reviewed by	
		03/07/14	

**NOTE:-**

1. ALL NUTS,BOLTS AND WASHERS, FUNNEL GI PIPE AND WIRE MESH SHALL BE GALVANISED AS PER SPECIFICATION.
2. FUNNEL SHALL BE SECURLY HELD TO THE PIPE.
3. TO BE USED FOR POWER TRANSFORMER, CONVERTER TRANSFORMER, LT TRANSFORMER, FILTER NEUTRAL, CAPACITOR NEUTRAL, CNG/DC SET & CVT.

**EQUIPMENT EARTHING DETAILS  
DETAILS OF PIPE EARTH ELECTRODE  
IN TREATED EARTH PIT**

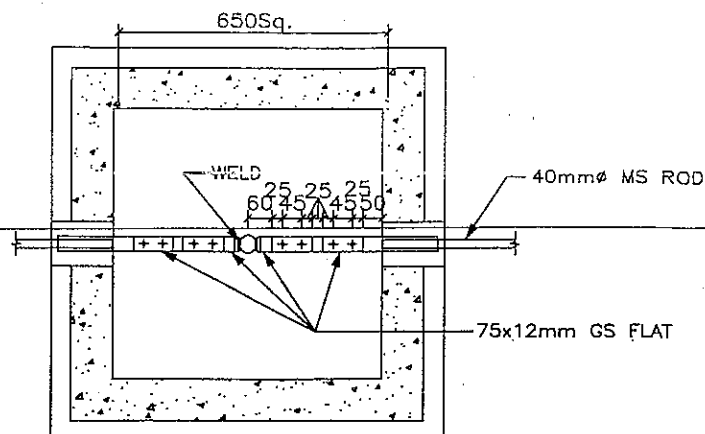
COMPUTERREF.NO.

DRG. No.

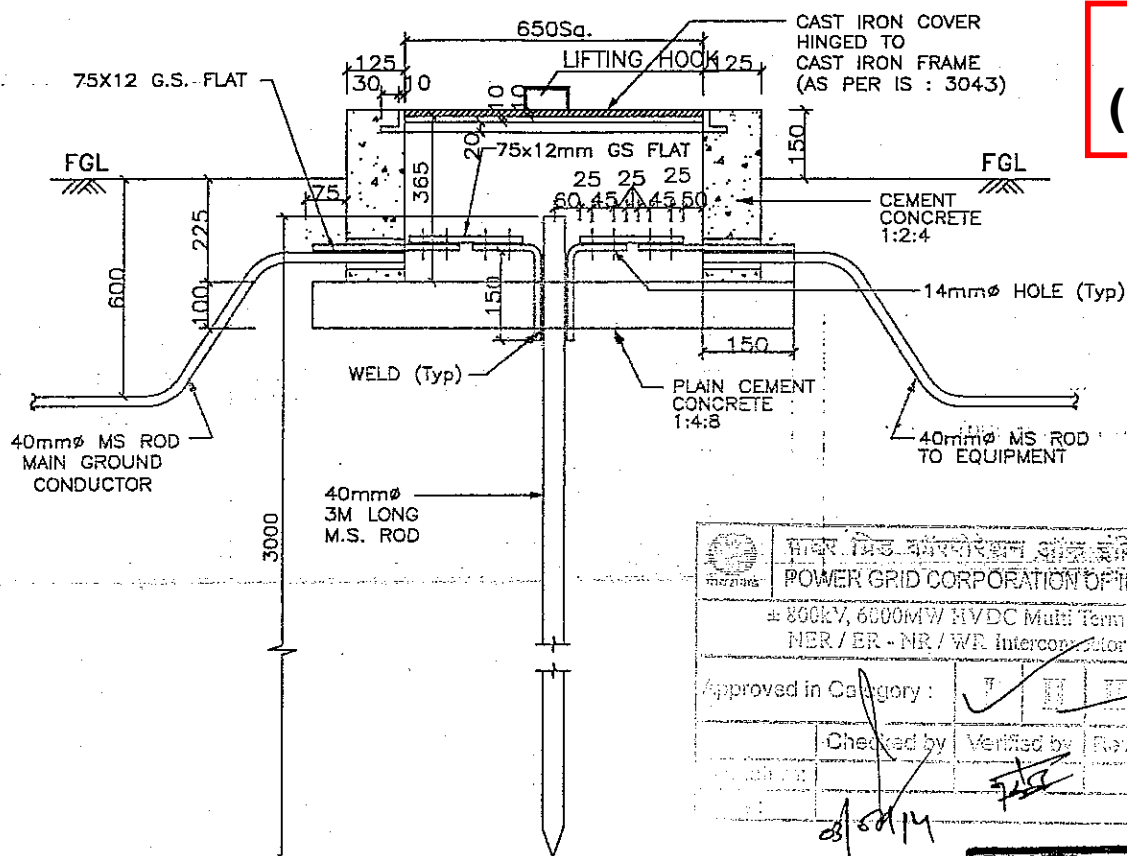
TB-4-343-316-131

REV. 03

SHEET No.  
11




## PLAN



### ELEVATION

**AS-BUILT**  
**(No Change)**

	भारत विद्युत वितरण निगम लि. POWER GRID CORPORATION OF INDIA LTD.		
± 800kV, 6600MW HVDC Multi Terminal NER / ER - NR / WF Interconnector I			
Approved in Category :	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Checked by	Verified by	Reviewed by	Issued by

**BHEL RELEASED FOR CONSTRUCTION DESTROY EARLIER PRINTS**  
SIGNED *A. R. T. S.* DATE *16 May*  
Transmission Projects  
Engineering Management

NOTE:—

1. TO BE USED FOR CONNECTING DOWN CONDUCTOR OF LIGHTNING PROTECTION SYSTEM, TOWER WITH PEAK.



## EQUIPMENT EARTHING DETAILS

### ROD EARTH ELECTRODE WITH EARTH PIT

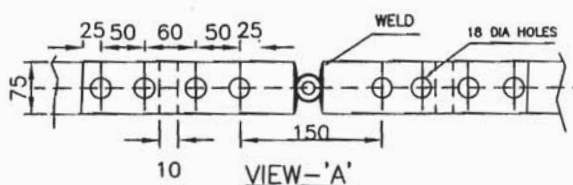
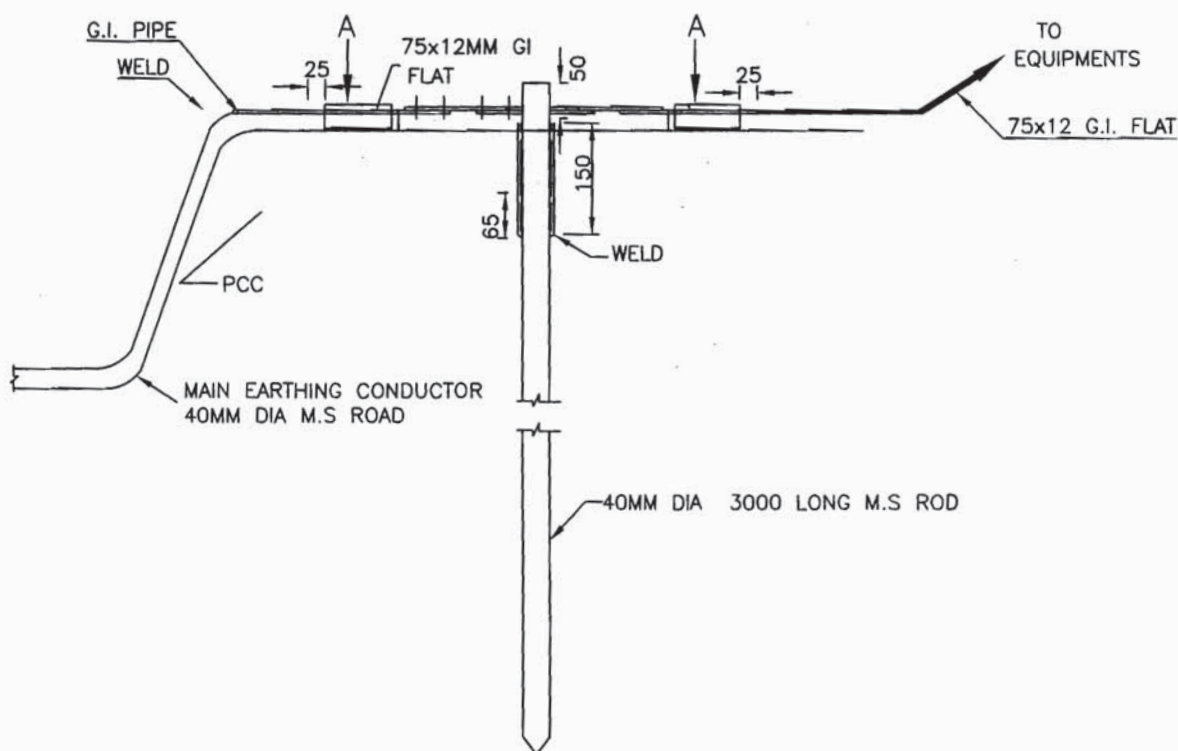
COMPU. DRG. REF.

DRG. No.

TB-4-343-316-131

REV. 03

SHEET No.  
11A



NOTE:-

1. TO BE USED FOR CONNECTING SURGE COUNTER OF LA AND ALONG THE PERIPHERY OF THE SWITCHYARD.

**AS-BUILT**  
**(No Change)**



# EQUIPMENT EARTHING DETAILS ROD EARTH ELECTRODE WITHOUT EARTH PIT

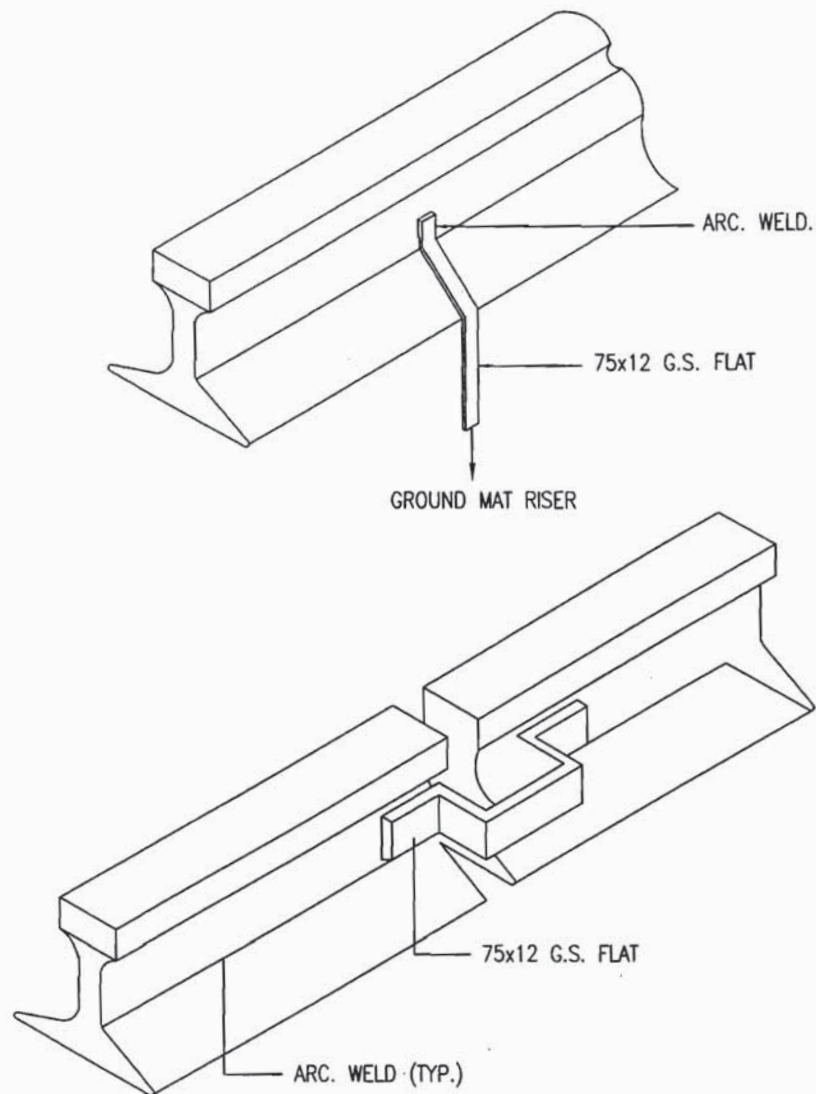
COMPU. DRG. REF.

DRG. No.

TB-4-343-316-131

REV. 00

SHEET No.  
11B



CH-2  
sum

**AS-BUILT  
(No Change)**

NOTE:--

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



## EQUIPMENT EARTHING DETAILS RAIL BONDING

COMPU. DRG. REF.

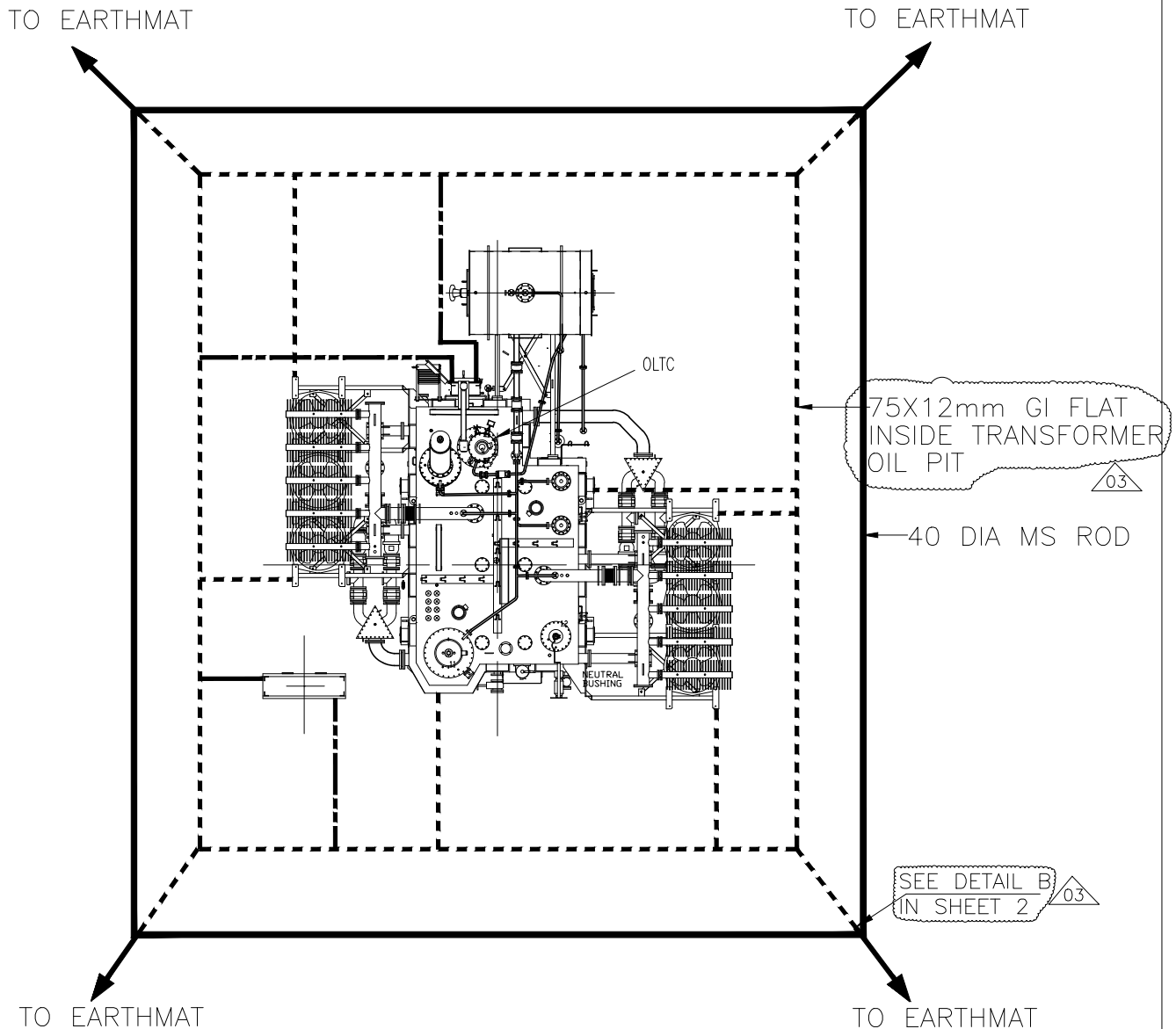
DRG. NO.

TB-4-343-316-131

REV. 00

SHEET No.  
12





NOTES:—

1. EARTH CONTINUITY ACROSS GASKETED JOINTS MUST BE ENSURED USING FLEXIBLE OR FLAT.
2. ALL ACCESSORIES ASSOCIATED WITH TRANSFORMER LIKE COOLING BANKS, RADIATORS, MAIN TANK, MARSHALLING KIOSK ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS AT OPPOSITE CORNERS.
3. NO OF RISERS
 

MAIN TANK	— 2NOS.
RADIATOR TANK	— 4NOS.
OLTC M. BOX	— 2NOS.
M. BOX	— 2NOS.

LEGENDS:—

- |      |                 |
|------|-----------------|
| ---  | 75X12mm GS FLAT |
| ---- | 50X6mm GS FLAT  |
| —    | 40mm dia MS ROD |

4. ADDITIONAL 75X12mm GI FLAT IS LAID INSIDE THE TRANSFORMER OIL PIT. ALL ACCESSORIES ARE CONNECTED THIS FLAT.

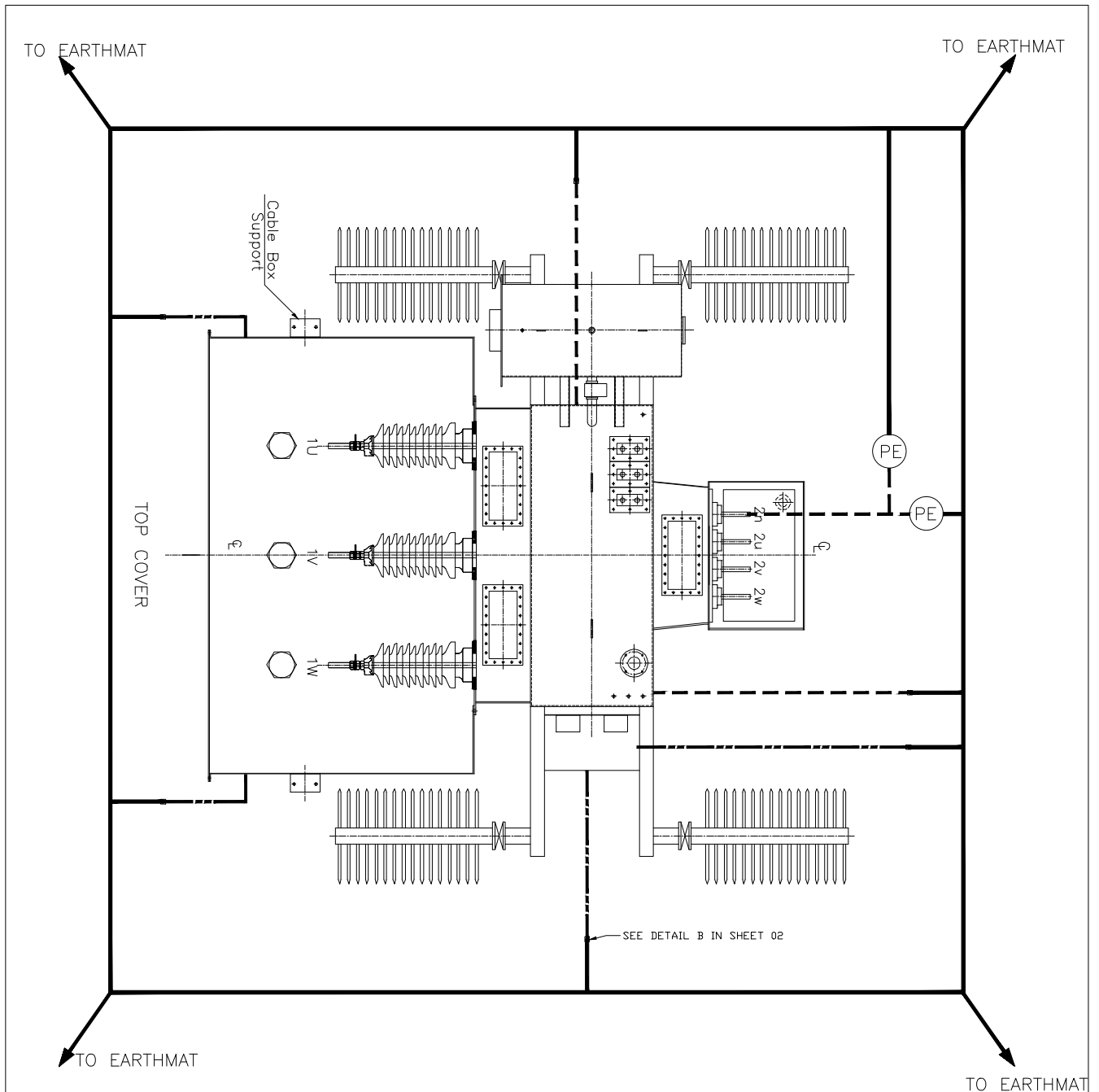
AS-BUILT



EQUIPMENT EARTHING DETAILS  
AUTO TRANSFORMER

DRG. No. TB-4-343-316-131-AS-BUILT REV. 03

SHEET No.  
13



**NOTES:-**

1. EARTH CONTINUITY ACROSS GASKETED JOINTS MUST BE ENSURED USING FLEXIBLE OR FLAT.
2. ALL ACCESSORIES ASSOCIATED WITH TRANSFORMER LIKE COOLING BANKS, RADIATORS, MAIN TANK, MARSHALLING KIOSK ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS AT OPPOSITE CORNERS.
3. NO OF RISERS  
MAIN TANK - 2NOS.  
M. BOX - 2NOS.  
CABLE BOX ASSEMBLY - 2NOS.
4. NO OF PIPE ELECTRODES - 2 NOS
5. TO AVOID LEAKAGE ISSUES (DIRECT WELDING WITH RADIATORS), EARTHING OF RADIATORS ARE AVOIDED 02

**LEGENDS:-**

- 75X12mm GS FLAT
- 50X6mm GS FLAT
- 40mm dia MS ROD
- (PE) PIPE ELECTRODE

AS-BUILT



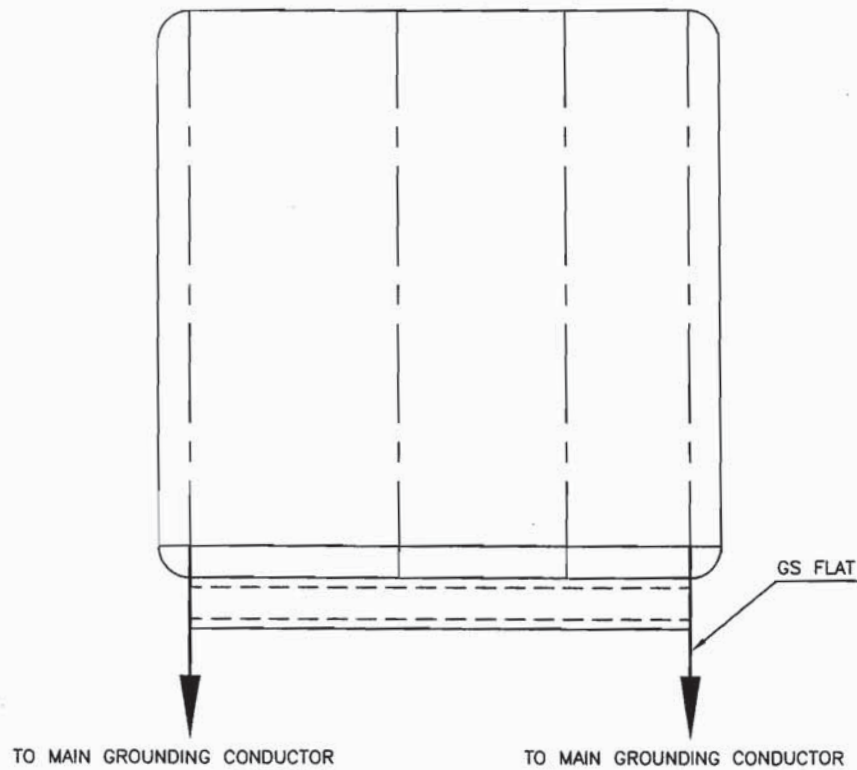
EQUIPMENT EARTHING DETAILS  
LT TRANSFORMER

DRG. No.

TB-4-343-316-131-AS-BUILT

REV. 02

SHEET No.  
13A



EQUIPMENT	FLAT SIZE
SWITCHGEAR/ MCC	50X6 MM
AC / DC DISTRIBUTION BOARDS	50X6 MM

Cat (I)  
mm

**AS-BUILT**  
**(No Change)**



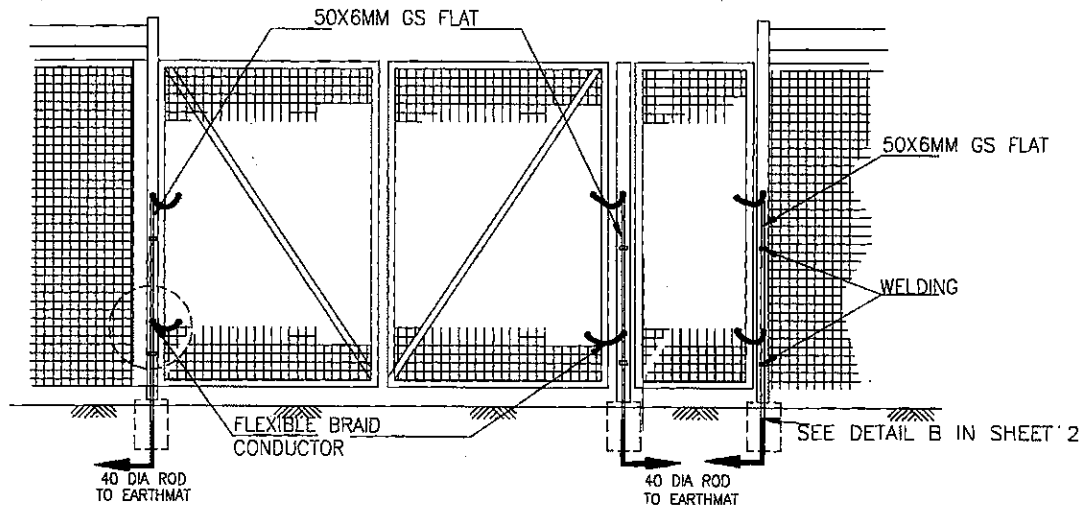
EQUIPMENT EARTHING DETAILS  
SWITCHGEAR / MCC

DRG. No. TB-4-343-316-131

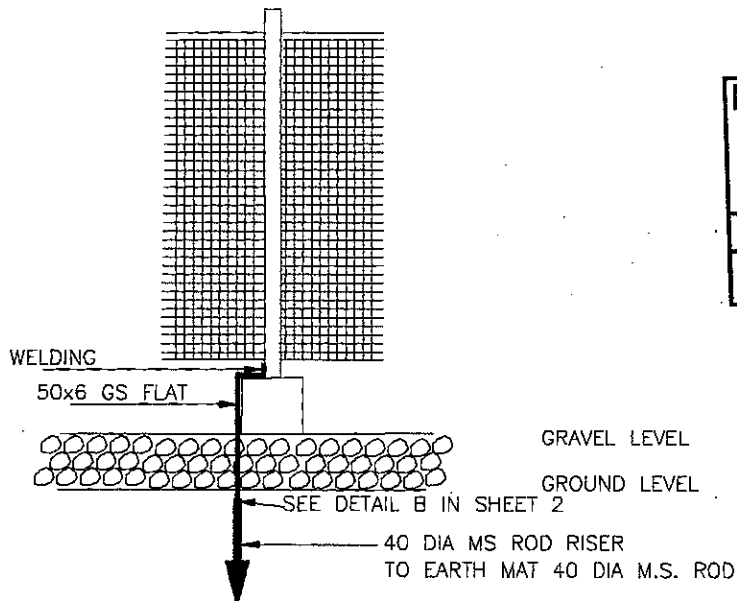
REV. 00

SHEET No.  
15

## GATE EARTHING



## FENCE POST EARTHING



**BHEL RELEASED FOR CONSTRUCTION DESTROY EARLIER PRINTS**  
SIGNED *G. S. Reddy* DATE *12/10/15*  
Transmission Projects Engineering Management

<p>पावर ग्रिड कारपोरेशन ऑफ इंडिया लि. POWER GRID CORPORATION OF INDIA LTD.</p>			
<p>1500 kV 6000 MW HVDC Multi Terminal NCR / ER-NR / WR Interconnector I</p>			
Category :	<input checked="" type="checkbox"/> I	<input checked="" type="checkbox"/> II	<input checked="" type="checkbox"/> III
Checked by	Verified by	Reviewed by	
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Date :	<i>24/10/15</i>		

### NOTES:-

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

**AS-BUILT**  
**(No Change)**



## EQUIPMENT EARTHING DETAILS FENCE POST

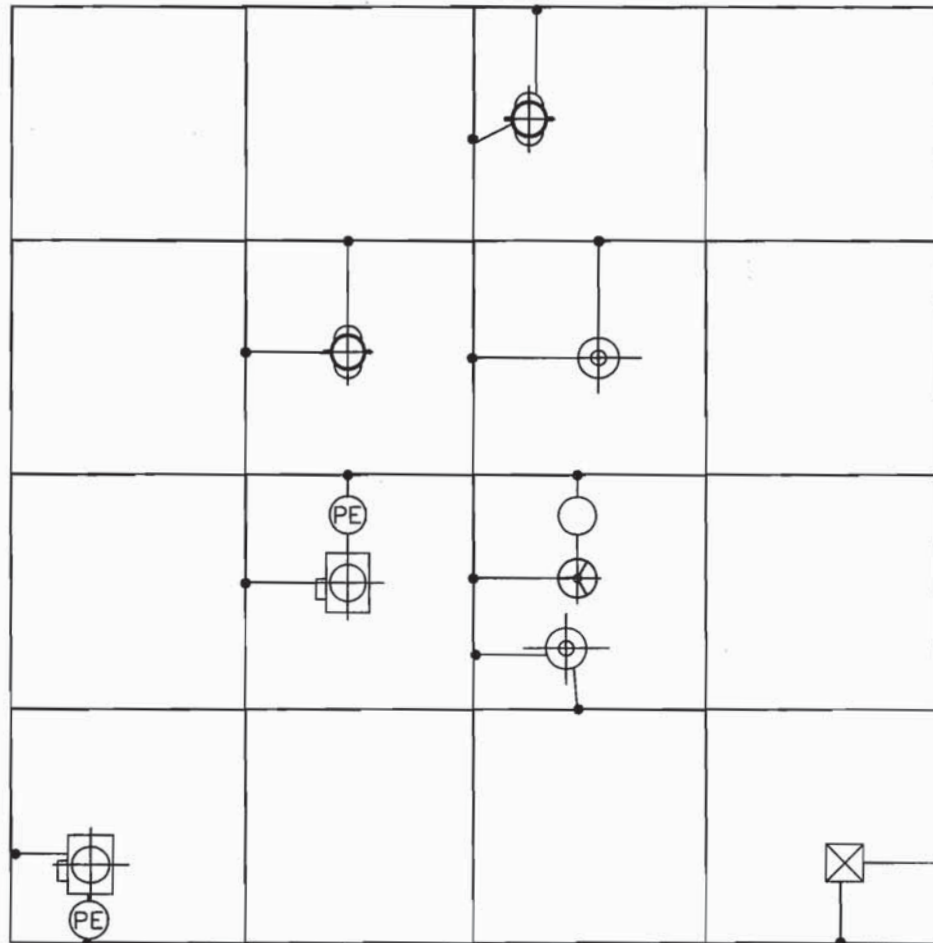
DRG. No.

TB-4-343-316-131

REV. 01

SHEET No.  
17

MAIN EARTHMAT GRID



40ø mm MS ROD

• - RISER

*cat I*

**AS-BUILT**  
**(No Change)**



EQUIPMENT EARTHING DETAILS  
TYPICAL ARRANGEMENT OF EQUIPMENT EARTHING WITH MAIN GRID

COMPU. DRG. REF.

DRG. NO.

TB-4-343-316-131

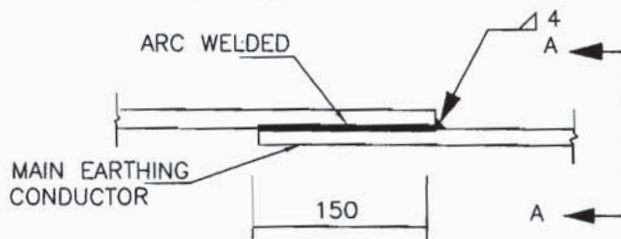
REV. 00

SHEET No.  
18

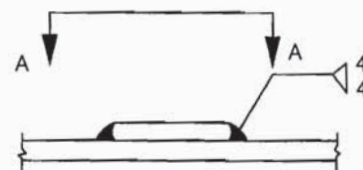
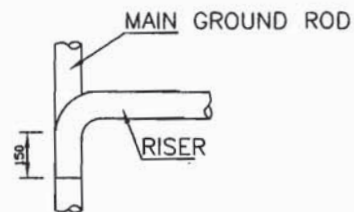
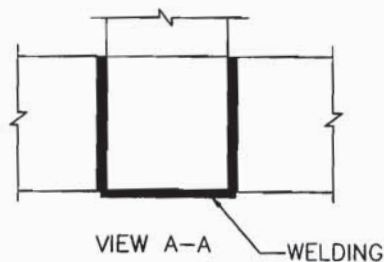


## STRIP TO STRIP

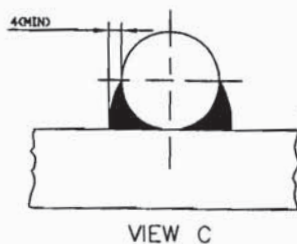
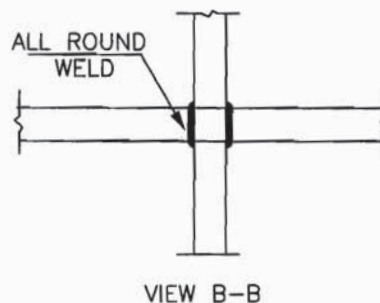
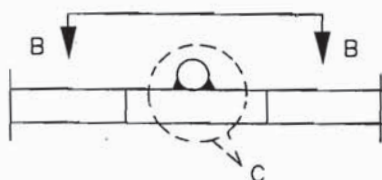
### 1. STRAIGHT LAP JOINT/RISER



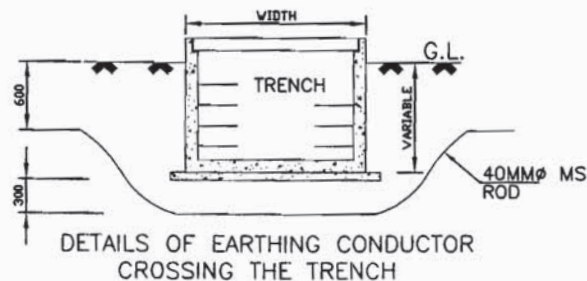
### 2. CROSS LAP JOINT



### RIGHT ANGLED JOINT (ROD TO ROD)



*cat I*  
*21mm*



## EQUIPMENT EARTHING DETAILS WELDING DETAIL

COMPUTERREF.NO.

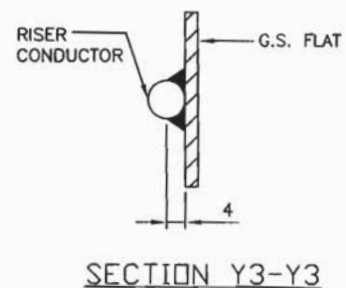
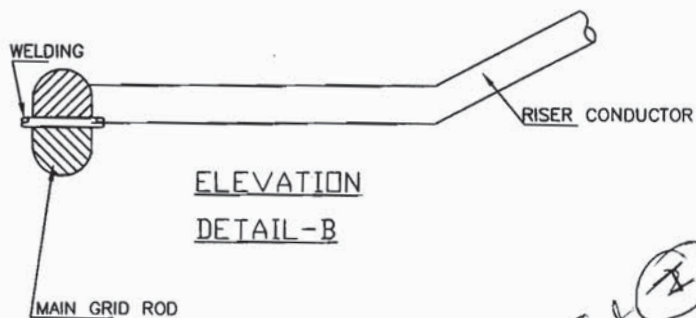
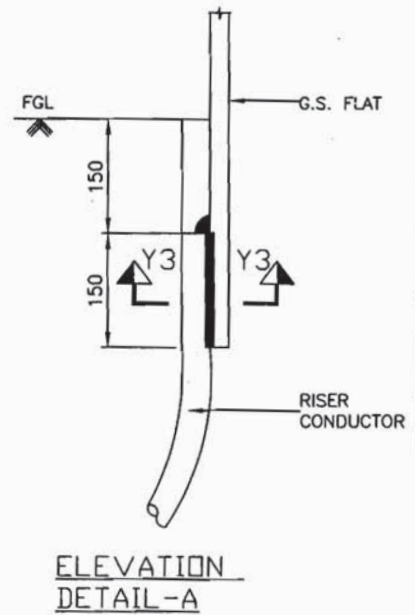
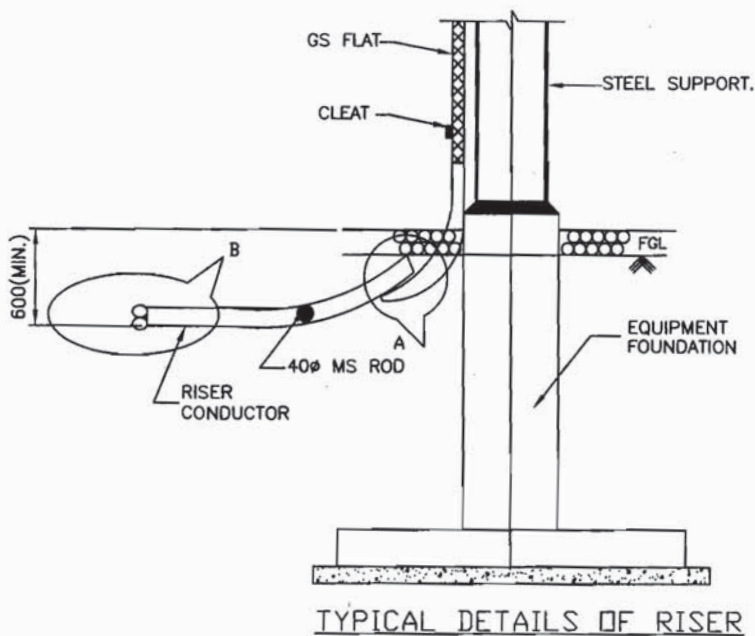
DRG. No.

TB-4-343-316-131

REV. 00

SHEET No.  
19

**AS-BUILT**  
**(No Change)**



Cal  
21/11/20

**AS-BUILT  
(No Change)**



**EQUIPMENT EARTHING DETAILS**  
WELDING DETAILS

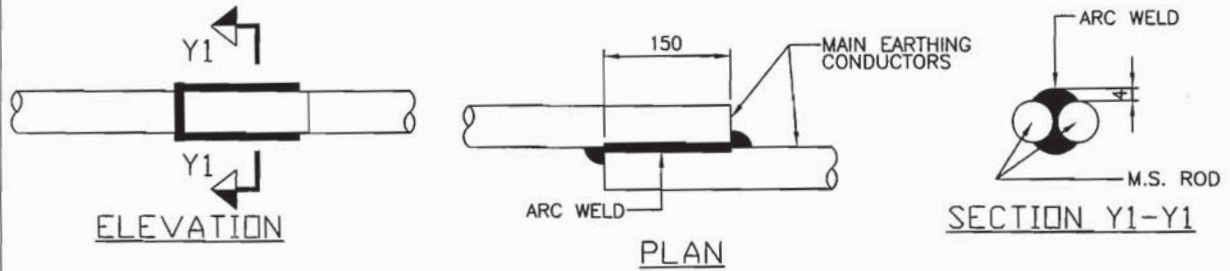
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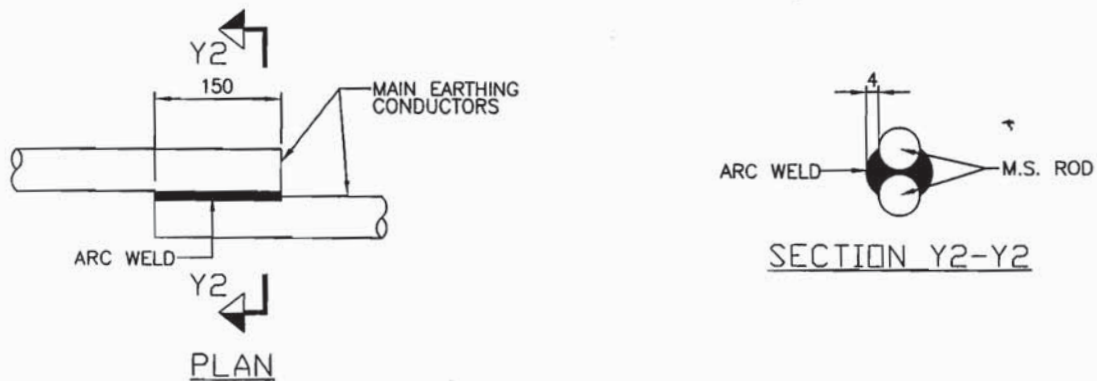
TB-4-343-316-131

REV. 00

SHEET No.  
20



(CONDUCTOR IN HORIZONTAL PLANE)



(CONDUCTOR IN VERTICAL PLANE)

Calc (I)  
vmm

**AS-BUILT**  
**(No Change)**



EQUIPMENT EARTHING DETAILS  
WELDING DETAILS

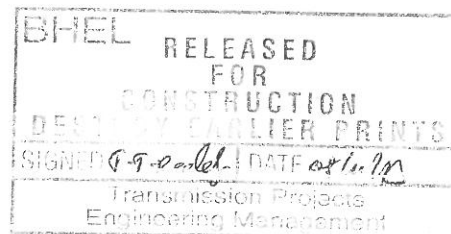
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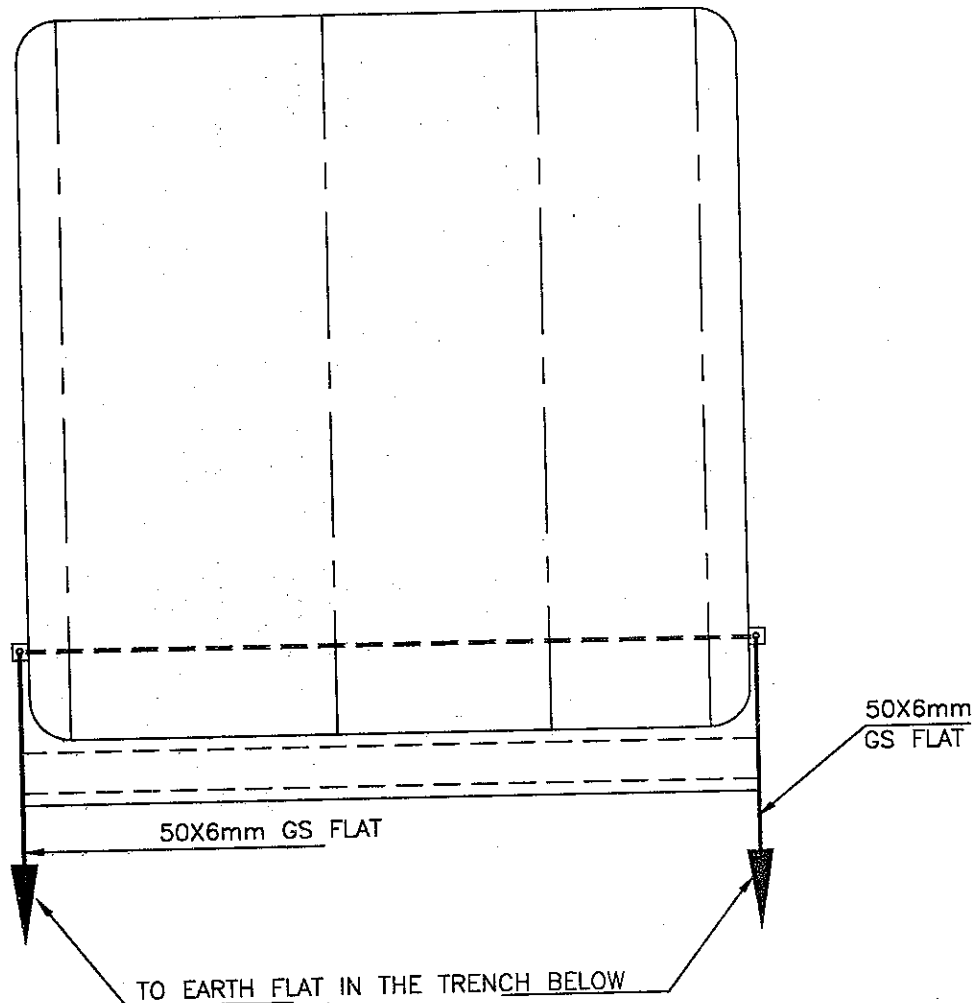
TB-4-343-316-131

REV. 00

SHEET No.  
21







NOTE:-

1. APPLICABLE TO CONTROL & RELAY PANELS IN ARBs, AC / DC DISTRIBUTION BOARDS, SWITCHGEAR/ MCC, BCU PANELS AND ETC.
2. IN CASE COMMON EARTH BAR CONNECTED A GROUP OF PANELS/CUBICLES, EARTHING TO THE EARTH BAR SHALL BE PROVIDED AT TWO END OF IND.

**BHEL** RELEASED  
FOR  
CONSTRUCTION  
DESTROY EARLIER PRINTS  
SIGNED: *[Signature]* DATE 18/12/15  
Transmission Projects  
Engineering Management

± 800 kV 6000 MW HVDC Multi Termin NER/ ER-NR/ WR Interconnector I			
Approved in Category :	<input checked="" type="checkbox"/> I	<input checked="" type="checkbox"/> II	<input checked="" type="checkbox"/> III
Checked by	Verified by	Reviewed by	
SI in Jans	<i>[Signature]</i>	<i>[Signature]</i>	
Date :	18/12/15		

**AS-BUILT**  
(No Change)



EQUIPMENT EARTHING DETAILS  
SWITCHGEAR, MCC, CONTROL AND RELAY PANELS

DRG. No. TB-4-343-316-131

REV. 00

SHEET No.  
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