

### SUBSTATION EARTH GRID AND EARTH TAILS NOTES:

1. THE MAIN EARTH GRID SHALL BE CONSTRUCTED FROM A 10mm DIAMETER ANNEALED COPPER ROD, BURIED AT LEAST 1000mm BELOW FINISHED GROUND LEVEL (UNLESS OTHERWISE INDICATED).
2. THE SUBSTATION EARTH GRID SHALL BE INSTALLED TO THE DIMENSIONS AS PER THE SUBSTATION EARTH GRID LAYOUT DRAWING.
3. ON FOUNDATION AND EARTHING DRAWINGS, ROD TRAVERSE CROSSINGS SHALL BE INDICATED BY AND THESE CROSSING SHALL BE JOINED AS PER D-DT-5240 SHT 2.
4. ALL JOINTS SHALL BE EXOTHERMICALLY WELDED OR OXY-ACETYLENE BRAZED, USING 3mm DIAMETER BRAZING RODS ACCORDING TO STANDARD EN1044 ITEM CP105.
5. WHERE THE EARTH GRID CLASHES WITH DEEPER FOUNDATIONS THE CONDUCTOR SHALL BE LAID 150mm BELOW THE FOUNDATIONS OR DEVIATED AROUND IT AS INDICATED ON D-DT-5240 SHT 23.
6. WHERE THE EARTH GRID CLASHES WITH DRAINS THE CONDUCTOR SHALL BE LAID 150mm BELOW IT AS DETAILED ON D-DT-5240 SHT 22.
7. WHERE A CONCRETE BLINDING IS CAST UNDER BUILDING FOUNDATIONS THE EARTH GRID MESHES ARE TO BE INSTALLED ON TOP OF THE BLINDING AND UNDER THE CONCRETE FOOTING OF COLUMNS ETC.
8. THE MAIN EARTH GRID SHALL BE 1000mm AWAY FROM THE INSIDE OF THE SUBSTATION SECURITY FENCE AND EXTEND BETWEEN 600mm AND 1000mm ON THE OUTSIDE OF THE SUBSTATION FENCE.
9. SUPPORT STRUCTURE EARTH TAILS SHALL BE 50X3mm FLAT ANNEALED COPPER BOLTED TO HOLDING DOWN BOLTS (UNLESS OTHERWISE INDICATED) AS DETAILED ON D-DT-5240 SHT 6.
10. WHERE AN EXTERNAL EARTH CONNECTION IS REQUIRED, THE 50X3mm FLAT COPPER SHALL BE BOLTED TO THE EQUIPMENT SUPPORT AS INDICATED ON D-DT-5240 SHT 6C.
11. THE NUMBER OF SUPPORT STRUCTURE EARTH CONNECTIONS SHALL DEPEND ON THE FAULT CURRENT (UNLESS OTHERWISE INDICATED):

DESIGN EARTH FAULT CURRENT	NUMBER OF EARTH TAILS PER STRUCTURE
25ka AND BELOW	2
BETWEEN 25ka AND 40ka	4

12. ADDITIONAL SUPPORT STRUCTURE EARTH TAILS FOR FAULT LEVELS ABOVE 25ka MUST BE IN ACCORDANCE WITH D-DT-5240 SHT 3.
13. WHERE EARTH TAILS CROSS THEY SHALL BE WELDED TOGETHER AS PER D-DT-5240 SHT 2.
14. ALL SUPPORT STRUCTURE HOLDING DOWN BOLTS SHALL BE M24 OR LARGER.
15. SACRIFIAL EARTH GRID ANODE SHALL BE INSTALLED FOR MILD TO SEVERE CORROSIVE SOIL CONDITIONS (<100 OHM.M). THE APPLICATION OF THESE ANODES WILL BE DETERMINED BY THE RESULTS OF THE SOIL TESTS CARRIED OUT BY ESKOM OR AN APPROINTEED REPRESENTATIVE. WHERE THE REQUIRED, THE SACRIFIAL ANODES ARE TO BE MANUFACTURED AND CONNECTED TO THE MAIN EARTH GRID AS INDICATED ON D-DT-5240 SHT 11.
16. WHERE FLAT COPPER EARTH STRAPS RUNS ACROSS VERTICAL OR HORIZONTAL FLAT SURFACES OF CONCRETE OR BRICK, IT SHALL BE SECURED AT ALL CORNERS, INTERSECTIONS AND LENGHTS NOT LONGER THAN 1000mm AS INDICATED ON D-DT-5240 SHT 12 DETAIL A.
17. WHERE FLAT COPPER EARTH STRAPS RUN ON FINISHED FLOOR SURFACES e.g. ACROSS WALKWAYS, THE STRAP SHALL BE SECURED TO THE FLOOR AS INDICATED ON D-DT-5240 SHT 12 DETAIL A.

18. WHERE CONNECTIONS ARE MADE TO GALVANISED STEELWORK, THE SURFACE SHALL BE CLEANED AND COATED WITH ANTI OXIDIZING ELECTRICAL COMPOUND PRIOR TO BOLTING.
19. WHERE CONNECTIONS ARE MADE TO PAINTED STEELWORK, THE PAINT SHALL BE REMOVED OVER A MINIMAL AREA TO ALLOW FOR A GOOD CONTACT BETWEEN THE SURFACES. SURFACES SHALL BE COATED WITH ANTI OXIDIZING ELECTRICAL COMPOUND BEFORE BOLTING. AFTER BOLTING, ANY SCRAPPED AREA NOT COVERED BY THE COPPER CONNECTION SHALL BE PAINTED USING HE ORIGINAL TYPE AND COLOUR OF PAINT.
20. TRANSFORMER PLINTH, SWITCH ROOM, CONTROL ROOM AND RUNWAY WELDED MESH REINFORCING SHALL BE BONDED TO THE MAIN EARTH GRID AT ONLY ONE POINT AS INDICATED ON D-DT-5240 SHT 10.
21. POWER TRANSFORMER EARTHING TO BE DONE ACCORDING TO D-DT-5240 SHT 5.
22. VOLTAGE TRANSFORMERS, CURRENT TRANSFORMERS, NECRTs AND JUNCTION BOXES ARE TO BE EARTH WITH FLEXIBLE COPPER TO THE EQUIPMENT SUPPORT AS INDICATED ON D-DT-5240 SHT 7.
23. ISOLATOR MECHANICAL BOX AND HANDLES ARE TO BE EARTHED IN ACCORDANCE WITH ISOLATOR MANUFACTURE'S SPECIFICATION, SEE D-DT-5240 SHT 8.
24. BUILDING ROOF EARTHING TO BE DONE AS SPECIFIED ON D-DT-5240 SHT 24.
25. FOR EARTH STRAP ARRANGEMENTS IN CABLE TRENCHES REFER TO DETAIL B ON D-DT-5240 SHEET 12.

D-DT-5240	SET 25 SHT 25	GUTTER EARTHING DETAIL	D-DT-5240	SET 25 SHT 11	SACRIFIAL EARTH GRID ANODE
D-DT-5240	SET 25 SHT 24	ROOF EARTHING DETAIL	D-DT-5240	SET 25 SHT 10	REINFORCING EARTHING DETAIL
D-DT-5240	SET 25 SHT 23	EARTH GRID TRENCH DETAIL	D-DT-5240	SET 25 SHT 9	SAFETY FENCE EARTHING DETAIL
D-DT-5240	SET 25 SHT 22	SUBSOIL TRENCH DETAIL	D-DT-5240	SET 25 SHT 8	TYPICAL ISOLATOR WITH SA EARTH
D-DT-5240	SET 25 SHT 21	MV 1-CORE CABLE TERM. AT META	D-DT-5240	SET 25 SHT 7	VT, CT AND JB EARTHING DETAIL
D-DT-5240	SET 25 SHT 20	MV 3-CORE CABLE TERM. AT META	D-DT-5240	SET 25 SHT 6C	TYPICAL SUPPORT EARTHING DETAIL
D-DT-5240	SET 25 SHT 19	MV 3-CORE CABLE TERM. AT TRAN	D-DT-5240	SET 25 SHT 6B	TYPICAL TERTIARY COLUMN FDN
D-DT-5240	SET 25 SHT 18	SIGNAL DISTRIBUTION FRAMES	D-DT-5240	SET 25 SHT 6A	TYPICAL COLUMN FDN EARTHING DET
D-DT-5240	SET 25 SHT 17	PROCESS CONTROL CABLES	D-DT-5240	SET 25 SHT 6	TYPICAL FOUNDATION EARTHING DET
D-DT-5240	SET 25 SHT 16	GPO UNARMoured TYPE 2 CABLE	D-DT-5240	SET 25 SHT 5	DETAIL OF TRFR CONCEALED EARTH
D-DT-5240	SET 25 SHT 15	ARM. TELEPHONE & CONTR. CABLE	D-DT-5240	SET 25 SHT 4A	TYPICAL STAR DELTA TRFR EARTH
D-DT-5240	SET 25 SHT 14	CONTROL PANEL EARTHING DETAIL	D-DT-5240	SET 25 SHT 4	TYPICAL AUTO TRFR EARTHING
D-DT-5240	SET 25 SHT 13	EARTHING OF SWITCH GEAR	D-DT-5240	SET 25 SHT 3	EARTH THROUGH FDN WITH WPCV
D-DT-5240	SET 25 SHT 12	EARTH STRAP FIXING DETAILS	D-DT-5240	SET 25 SHT 2	COPPER JOINTS DETAILS
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:	DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

5	REVISED GENERAL NOTES	BMH	JKR	T.MARAIS	05/04/2019	
4	NOTE 10 HOLDING DOWN BOLTS CHANGED	P.A.T.	T.MARAIS	T.MARAIS	28/03/2013	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



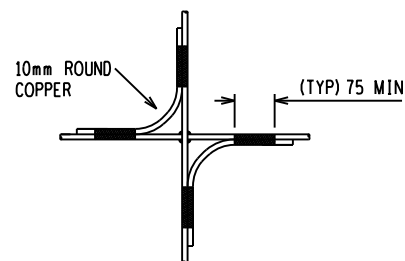
## EARTHING STANDARD GENERAL NOTES

AUTH: C. CLARK  
DATE: 05/11/2004  
CHKD: C. CLARK

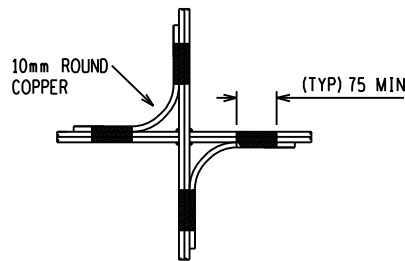
SAP No.	DATE: 05/11/2004	SET	SHEET	REVISION
SCALE 1:10	DRAWN: V VAN ZWEELE	D-DT-5240	25	1
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE: 01/11/2004			5

1 2 3 4 5 6 7 8

A

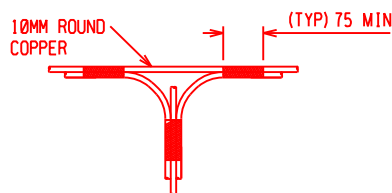


TYPE A  
ROUND COPPER JOINT

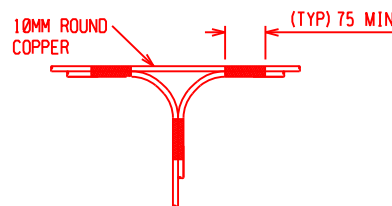


TYPE B  
DOUBLE ROUND COPPER JOINT

B

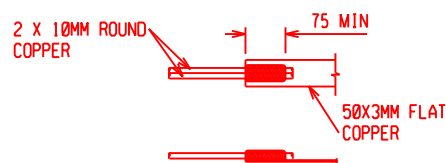


TYPE C1  
ROUND COPPER TEE JOINT

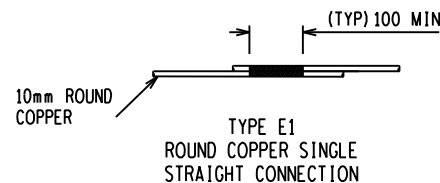


TYPE C2  
ROUND COPPER TEE JOINT

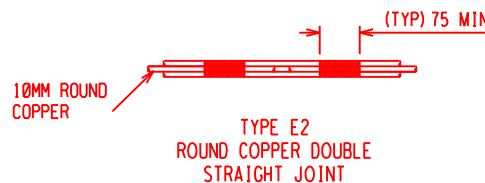
C



TYPE D  
2x ROUND COPPER TO FLAT  
COPPER STRAIGHT JOINT



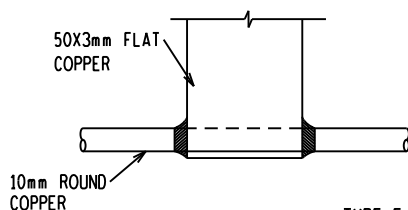
TYPE E1  
ROUND COPPER SINGLE  
STRAIGHT CONNECTION



TYPE E2  
ROUND COPPER DOUBLE  
STRAIGHT JOINT

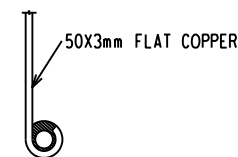
D

E



TYPE F  
ROUND COPPER TO FLAT COPPER JOINT  
(NTS)

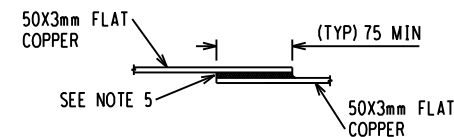
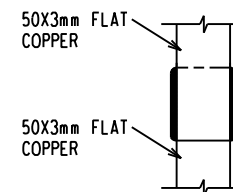
F



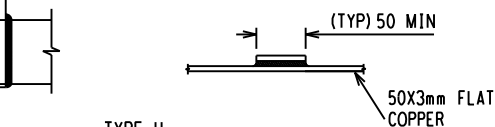
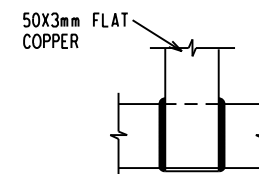
### NOTES:

1. ALL JOINTS SHALL BE EXOTHERMICALLY WELDED OR OXY-ACETYLENE BRAZED, USING 3MM DIAMETER BRAZING RODS ACCORDING TO STANDARD EN1044 ITEM CP105.
2. ALL COPPER CONNECTIONS ARE TO BE BOUNDED TOGETHER AS INDICATED.
3. SEE D-DT-6044 FOR 10mm DIA ROUND COPPER DETAIL.
4. SEE D-DT-6045 FOR 50 x 3mm FLAT COPPER DETAIL.

▨ - BRAZED OR EXOTHORMIC WELD



TYPE G  
STRAIGHT JOINT  
(NTS)



TYPE H  
T AND TRANSVERSE JOINT  
(NTS)

D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
3	REVISED EARTHING JOINTS & ADDED TYPE C1, C2, D & E2	BMH	JKR	T. MARAIS	05/04/2019	
2	NOTES CHANGED AS PER DST 34-1245	P.A.T.	T. M.	V SINGH	27/02/2012	



## EARTHING STANDARD COPPER JOINTS DETAILS

AUTH: C. CLARK

DATE: 05/11/2004

CHKD: C. CLARK

SAP No. DATE: 05/11/2004

SCALE 1:10 DRAWN: W VAN ZWEEL

THIS DRAWING IS THE PROPERTY OF ESKOM DATE: 01/11/2004

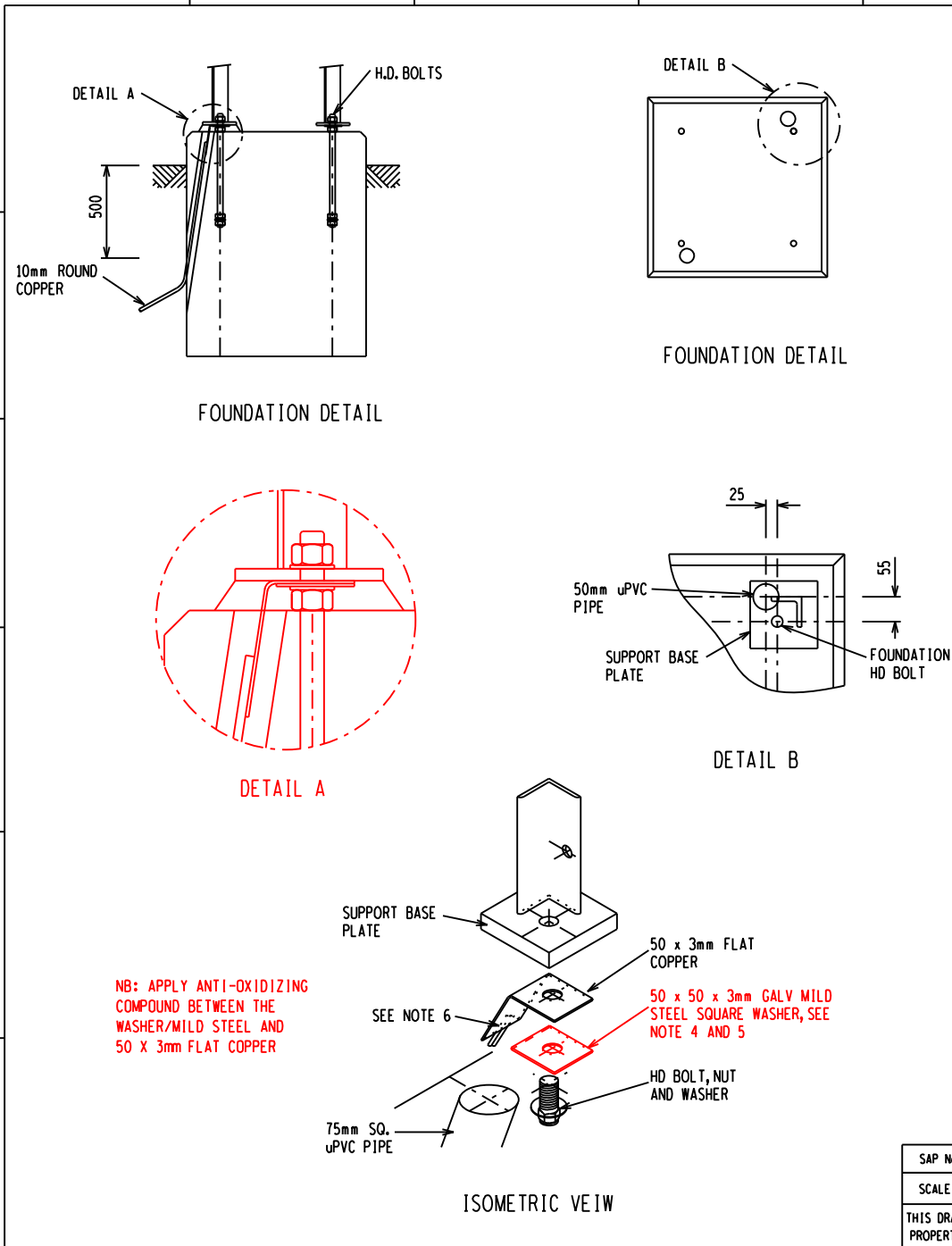
D-DT-5240

25

2

3

1 2 3 4 5 6 7 8 A3L




# NOTES:

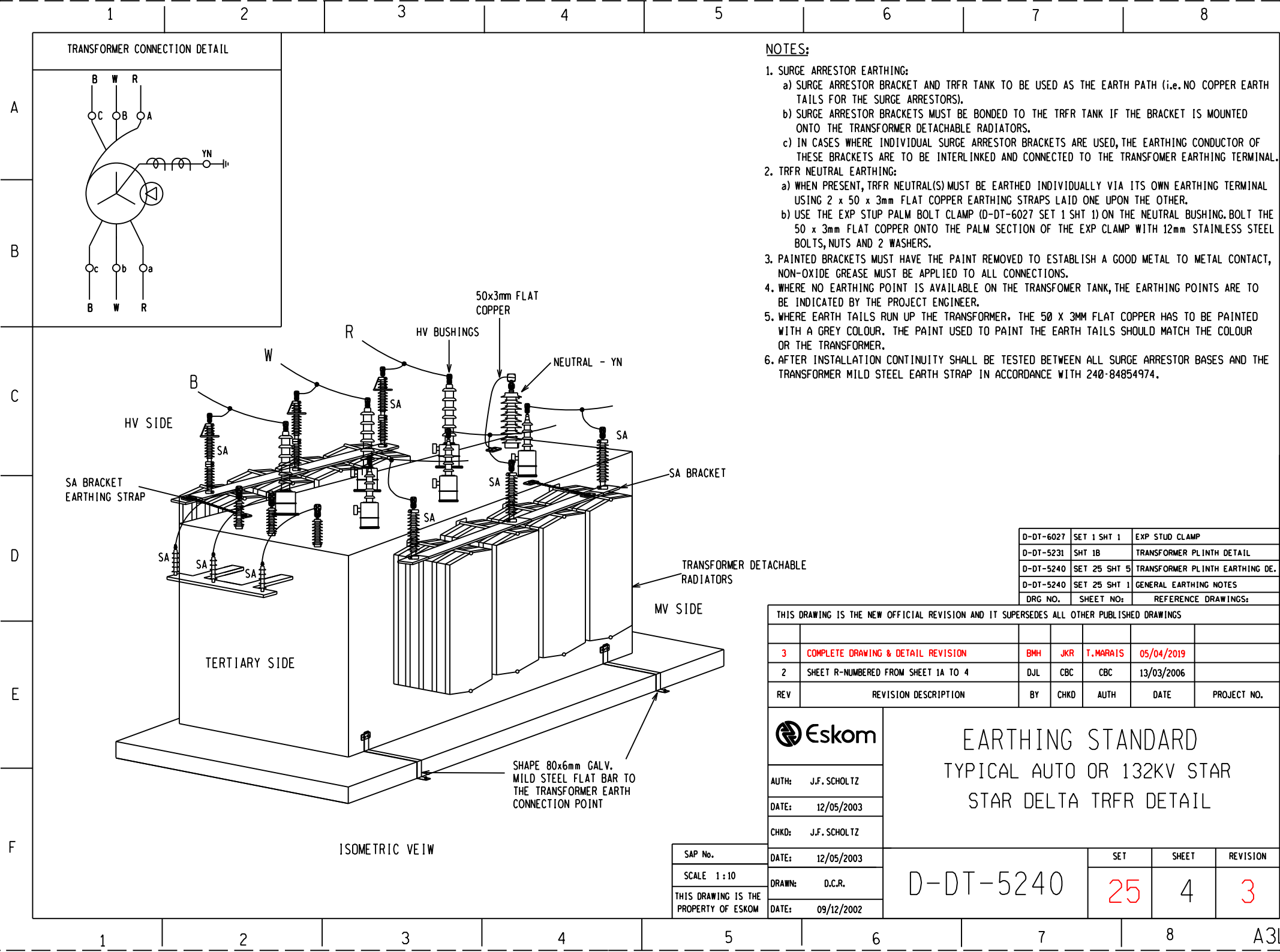
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE EARTH GRID LAYOUT & DETAILED FOUNDATION DRAWING.
- CIVIL WORKS SHOULD COMPLY TO THE DETAILED FOUNDATION DRAWING.
- WHERE CONNECTIONS ARE MADE TO GALVANISED STEELWORK, THE COPPER SURFACE SHALL BE COATED WITH ANTI-OXIDIZING ELECTRICAL COMPOUND.
- TO ENSURE A GOOD CONTACT BETWEEN THE 50 x 3mm FLAT COPPER & SUPPORT, USE A 50 x 50 x 3mm GALVANISED SQUARE WASHER BELOW THE 50 x 3mm FLAT COPPER.
- ENSURE THAT DIAMETER OF THE HOLE ON THE GALVANISED SQUARE WASHER IS 2mm BIGGER THAN THE DIAMETER OF THE HD BOLT.
- BRAZE 2 x 10mm ROUND COPPER WITH THE 50 x 3mm FLAT COPPER AS INDICATED ON D-DT-5240 SET 22 SHEET 2.

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

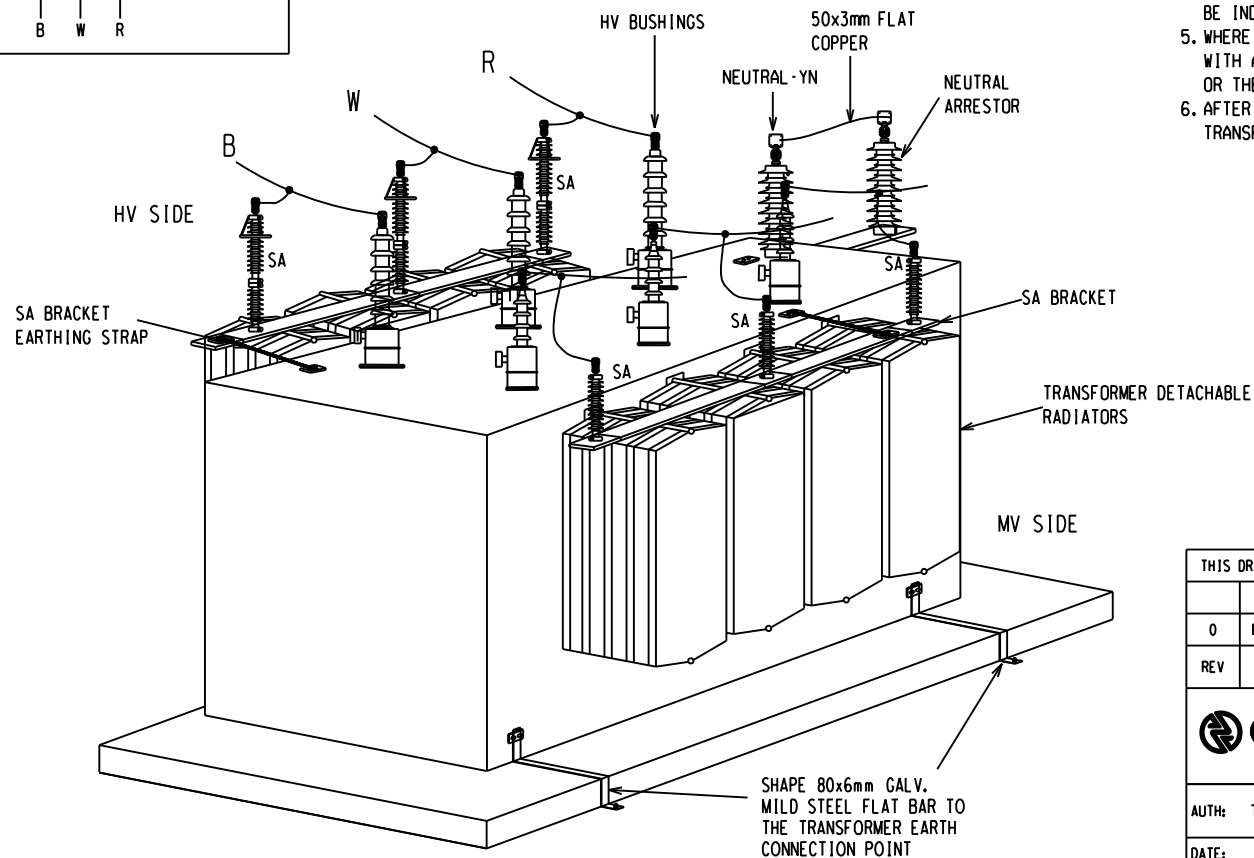
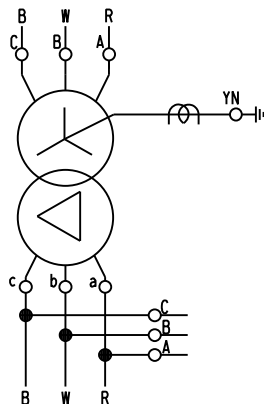
THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

3	REVISED CONNECTION DETAIL AND MODIFIED NOTES	BMH	JKR	T. MARAIS	05/04/2019	
2	NOTES CHANGED AS PER DST 34-1245	P.A.T.	T.M.	V SINGH	27/02/2012	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

 Eskom		EARTHING STANDARD EARTH THROUGH FOUNDATION WITH uPVC PIPE FROM 25KA TO 40KA			
AUTH: C. CLARK					
DATE: 13/03/2006					
CHKD: C. CLARK					
DATE: 13/03/2006		D-DT-5240	SET	SHEET	REVISION
DRAWN: DJ LAUBSCHER			25	3	3
DATE: 01/11/2004					



# TRANSFORMER CONNECTION DETAIL



ISOMETRIC VIEW

## NOTES:

- SURGE ARRESTOR EARTHING:**
  - SURGE ARRESTOR BRACKET AND TRFR TANK TO BE USED AS THE EARTH PATH (i.e. NO COPPER EARTH TAILS FOR THE SURGE ARRESTORS).
  - SURGE ARRESTOR BRACKETS MUST BE BONDED TO THE TRFR TANK IF THE BRACKET IS MOUNTED ONTO THE TRANSFORMER DETACHABLE RADIATORS.
  - IN CASES WHERE INDIVIDUAL SURGE ARRESTOR BRACKETS ARE USED, THE EARTHING OF THESE BRACKETS ARE TO BE INTERLINKED AND CONNECTED TO THE TRANSFORMER EARTHING TERMINAL.
- TRFR NEUTRAL EARTHING:**
  - WHEN PRESENT, TRFR NEUTRAL(S) MUST BE EARTHED INDIVIDUALLY VIA ITS OWN EARTHING TERMINAL USING 2 x 50 x 3mm FLAT COPPER EARTHING STRAPS LAID ONE UPON THE OTHER.
  - USE THE EXP STUP PALM BOLT CLAMP (D-DT-6027 SET 1 SHT 1) ON THE NEUTRAL BUSHING. BOLT THE 50 x 3mm FLAT COPPER ONTO THE PALM SECTION OF THE EXP CLAMP WITH 12mm STAINLESS STEEL BOLTS, NUTS AND 2 WASHERS.
- PAINTED BRACKETS MUST HAVE THE PAINT REMOVED TO ESTABLISH A GOOD METAL TO METAL CONTACT, NON-OXIDE GREASE MUST BE APPLIED TO ALL CONNECTIONS.
- WHERE NO EARTHING POINT IS AVAILABLE ON THE TRANSFORMER TANK, THE EARTHING POINTS ARE TO BE INDICATED BY THE PROJECT ENGINEER.
- WHERE EARTH TAILS RUN UP THE TRANSFORMER, THE 50 x 3mm FLAT COPPER HAS TO BE PAINTED WITH A GREY COLOUR. THE PAINT USED TO PAINT THE EARTH TAILS SHOULD MATCH THE COLOUR OR THE TRANSFORMER.
- AFTER INSTALLATION CONTINUITY SHALL BE TESTED BETWEEN ALL SURGE ARRESTOR BASES AND THE TRANSFORMER MILD STEEL EARTH STRAP IN ACCORDANCE WITH 240-84854974.

D-DT-6027	SET 1 SHT 1	EXP STUD CLAMP
D-DT-5231	SHT 1B	TRANSFORMER PLINTH DETAIL
D-DT-5240	SET 25 SHT 5	TRANSFORMER PLINTH EARTHING DE.
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

0	FIRST ISSUE				/ /	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



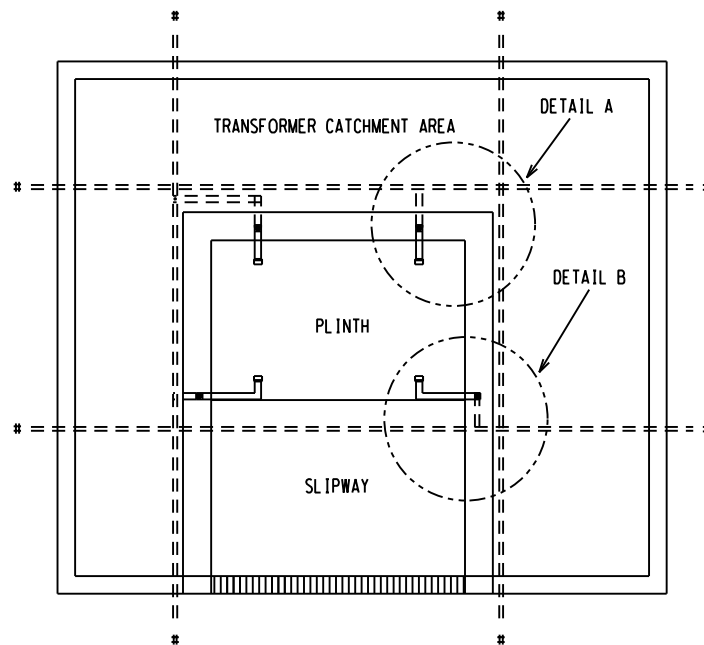
AUTH: T. MARAIS  
DATE: 05/04/2019  
CHKD: J.K. RAGHUBIR

## EARTHING STANDARD TYPICAL 88KV STAR DELTA TRFR EARTHING DETAIL

SAP No.	DATE: 05/04/2019
SCALE 1:10	DRAWN: BM HLOMENDLINI
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE: 20/02/2019

D-DT-5240

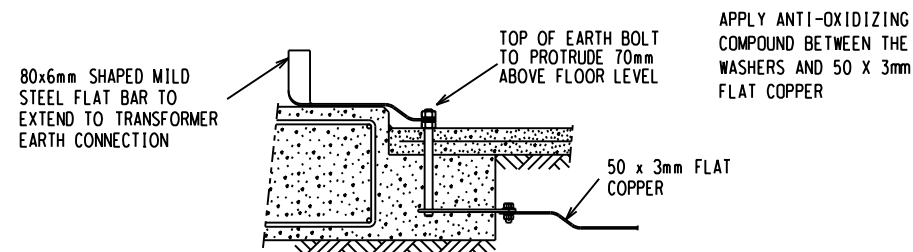
SET	SHEET	REVISION
25	4A	0



TYPICAL FRONT ENTRY TRANSFORMER BUND AREA  
PLAN VIEW

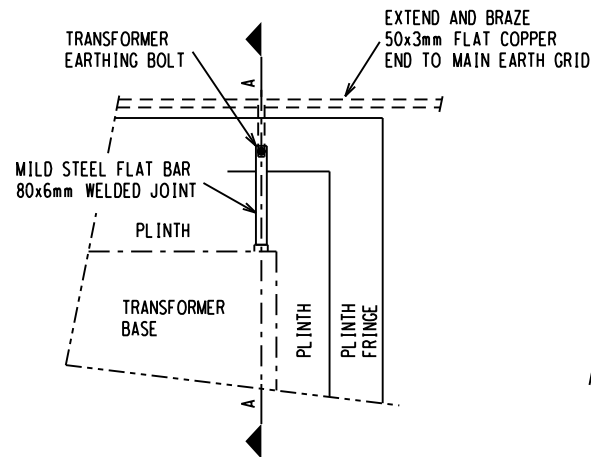
# NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE EARTH GRID LAYOUT & DETAILED FOUNDATION DRAWING.
2. CIVIL WORKS SHOULD COMPLY TO THE DETAILED FOUNDATION DRAWING, TRANSFORMER ENTRY OPTIONS VARY FROM FRONT ENTRY, RIGHT ENTRY, LEFT ENTRY AND REAR ENTRY.
3. A 80x6mm MILD GALVANISED STEEL BAR IS TO BE USED FOR TRANSFORMER EARTHING AS INDICATED ON SECTION A-A.
4. WHERE UNDERGROUND CONNECTIONS ARE MADE TO GALVANISED STEELWORK, THE COPPER SURFACE HAS TO BE TINNED AND COAT WITH ANTI-OXIDIZING ELECTRICAL COMPOUND.  
ALL TINNED COPPER MUST BE TREATED AS DESCRIBED PRIOR TO MAKING A CONNECTION  
A) WASH AND BRUSH TINNED AREA IN WATER AFTER TINNING;  
B) APPLY THIN LAYER OF NON-OXIDE GREASE ONLY TO TINNED AREAS FACING GALV STEELWORK.
5. FOR EARTHING BOLT SPECIFICATION SEE D-DT-5231 SHEET 1B.
6. # - FLAT COPPER TO BE 500mm BELOW THE CONCRETE FLOOR AND EXTEND TO THE MAIN EARTH GRID.

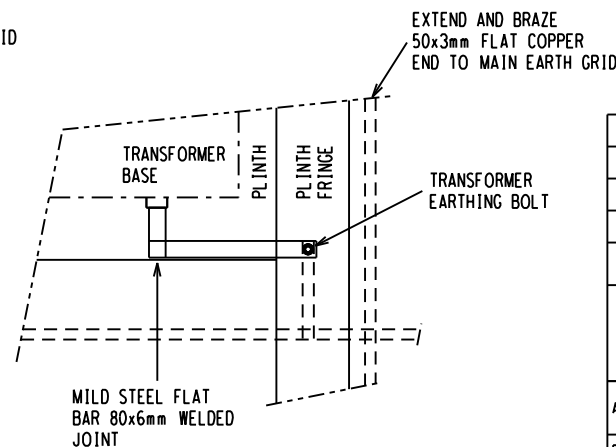


SECTION A-A  
TYPICAL EARTHING BOLT  
FOUNDATION ASSEMBLY

D-DT-5231	SHT 1B	TRANSFORMER PLINTH DETAIL
D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS



DETAIL A  
TYPICAL EARTHING BOLT  
FOUNDATION ASSEMBLY



DETAIL B  
TYPICAL EARTHING BOLT  
FOUNDATION ASSEMBLY

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

3	COMPLETE DRAWING AND CONNECTION DETAIL REVISION	BMH	JKR	T.MARAI	05/04/2019	
2	NOTE ADDED TO SHOW CONNECTION TO MAIN EARTH GRID SHEET RE-NUMBERED FROM 1B TO SHEET 5.	DJL	CBC	CBC	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



## EARTHING STANDARD DETAIL OF TRANSFORMER CONCEALED EARTHING

AUTH: J.F. SCHOLTZ

DATE: 12/05/2003

CHKD: J.F. SCHOLTZ

DATE: 12/05/2003

DRAWN: D.C.R.

DATE: 09/12/2002

SAP No.

SCALE 1:10

THIS DRAWING IS THE  
PROPERTY OF ESKOM

D-DT-5240

SET

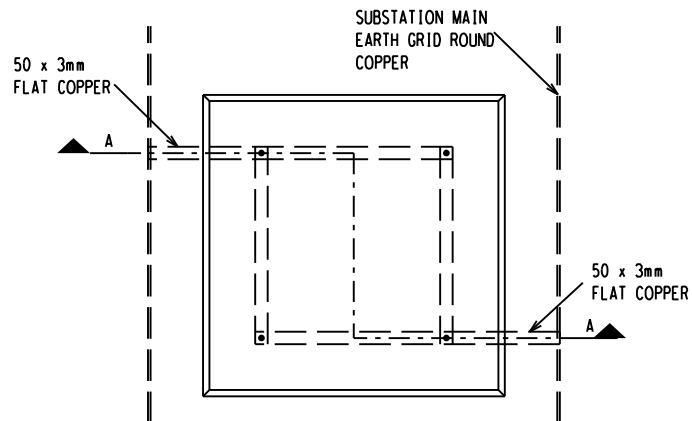
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SHEET

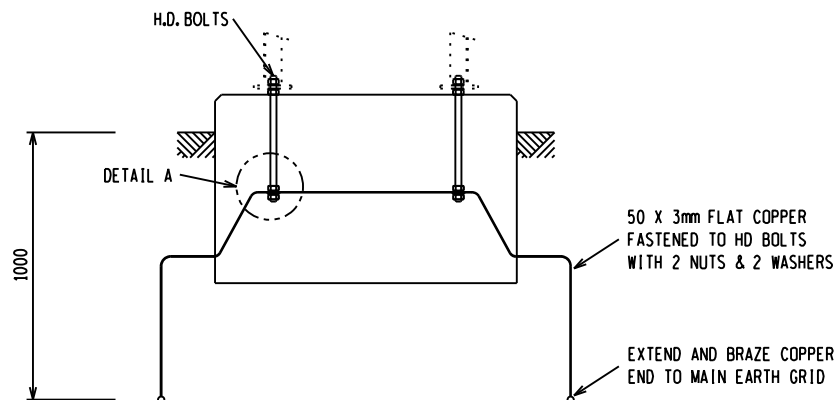
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REVISION

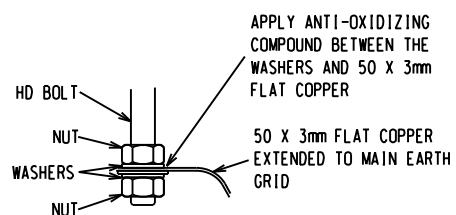
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PLAN



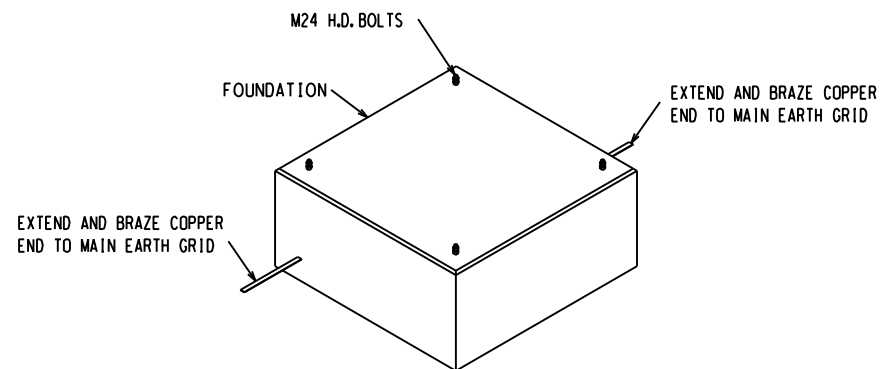
SECTION A-A



DETAIL A  
HD BOLT EARTHING CONNECTION  
NTS

# NOTES:

1. FOUNDATION EARTHING METHODS VARY ACCORDING TO THE TYPE OF FOUNDATION.
2. FOR DETAILED FOUNDATION EARTHING, SEE MAIN SUBSTATION EARTH GRID LAYOUT DRAWING AND FOUNDATION DETAIL.
3. BOLT THE 50 x 3mm EARTH TAIL TO THE FOUNDATION HD BOLTS USING 2 NUTS AND 2 WASHERS.
4. FOUNDATION EARTH TAILS ARE TO BE CONNECTED TO DIFFERENT ROUND COPPER RODS.
5. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.



ISOMETRIC VIEW  
(NTS)

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS					
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE
3	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T.MARAIIS	05/04/2019
2	SECTION THROUGH FOUNDATION ADDED SHOWING CONNECTION OF THE 50x3mm COPPER TO HOLDING DOWN BOLTS.	VvZ	CBC	CBC	19/02/2007

		<h2>EARTHING STANDARD</h2> <h3>TYPICAL EQUIPMENT FOUNDATION</h3> <h3>DETAIL</h3>			
AUTH:	J.F. SCHOLTZ				
DATE:	12/05/2003				
CHKD:	J.F. SCHOLTZ				
SAP No.	DATE:	12/05/2003	SET	SHEET	REVISION
SCALE 1:10	DRAWN:	J.F. SCHOLTZ	D-DT-5240	25	6
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE:	09/12/2002			3

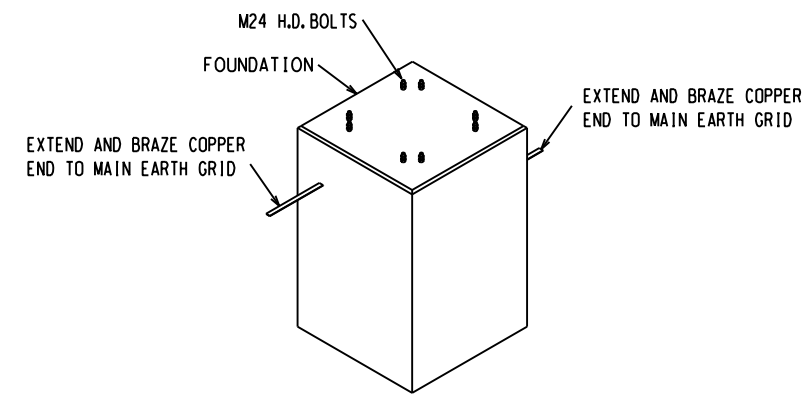
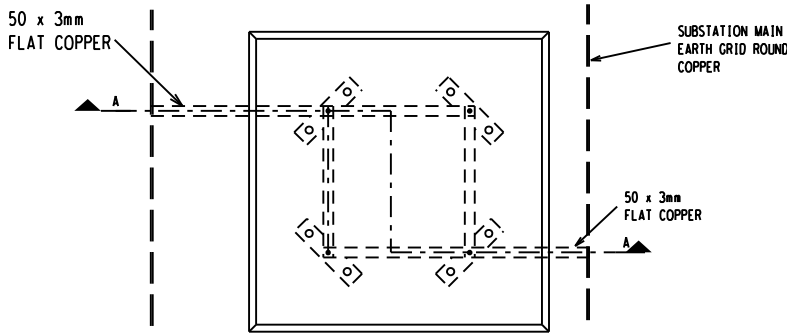
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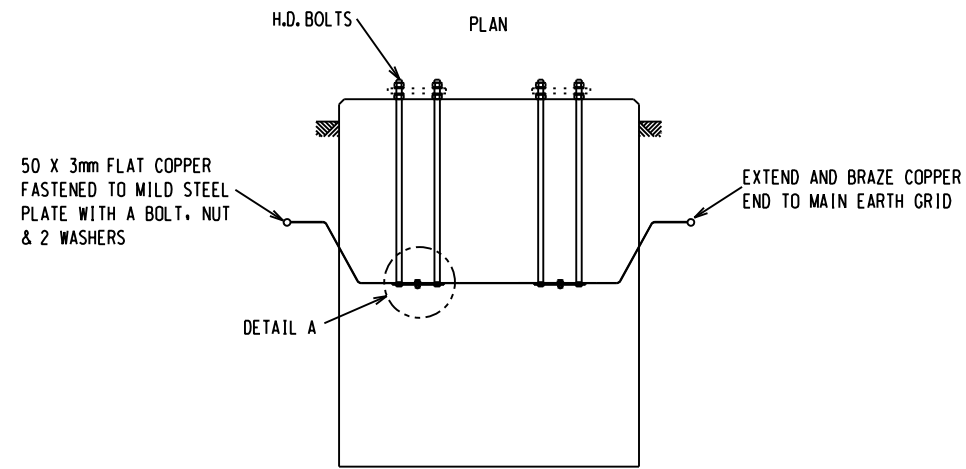
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NOTES:

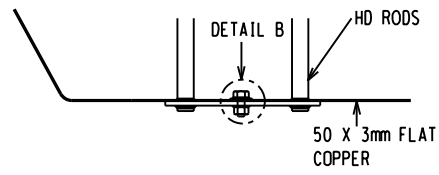
1. FOUNDATION EARTHING METHODS VARY ACCORDING TO THE TYPE OF FOUNDATION.
2. FOR DETAILED FOUNDATION EARTHING, SEE MAIN SUBSTATION EARTH GRID LAYOUT DRAWING AND FOUNDATION DETAIL.
3. BOLT THE 50 x 3mm EARTH TAIL TO THE MILD STEEL PLATE WITH A BOLT, NUT & 2 WASHERS.
4. FOUNDATION EARTH TAILS ARE TO BE CONNECTED TO DIFFERENT ROUND COPPER RODS.
5. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.



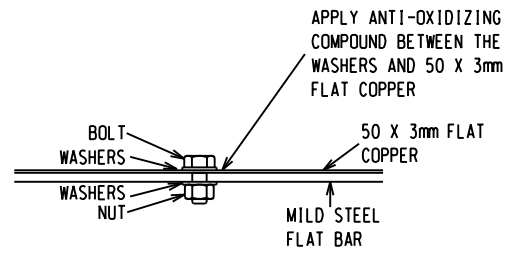
ISOMETRIC VIEW (NTS)



SECTION A-A



DETAIL A  
HD BOLT DETAIL



DETAIL B  
EARTHING CONNECTION DETAIL

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

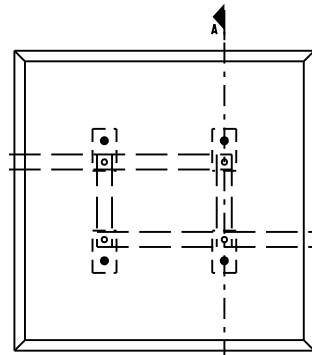
THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS						
0	FIRST ISSUE				/ /	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

		EARTHING STANDARD TYPICAL COLUMN FOUNDATION DETAIL				
AUTH: T. MARAIS						
DATE: 05/04/2019						
CHKD: J.K. RAGHUBIR						
SAP No.	DATE: 05/04/2019	D-DT-5240		SET	SHEET	REVISION
SCALE 1:10	DRAWN: BM HLOMENOLINI			25	6A	0
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE: 20/02/2019					

1 2 3 4 5 6 7 8 A3L



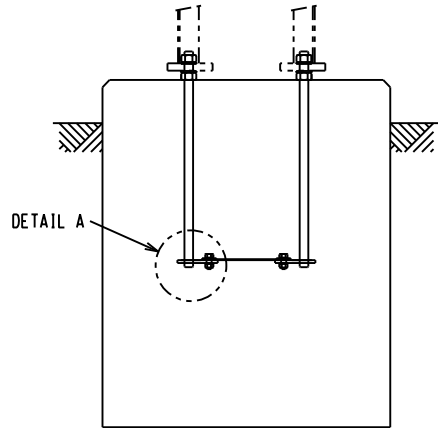
50 X 3mm FLAT COPPER  
FASTENED TO MILD STEEL  
PLATE WITH A BOLT, NUT  
& 2 WASHERS



PLAN

SUBSTATION MAIN  
EARTH GRID ROUND  
COPPER

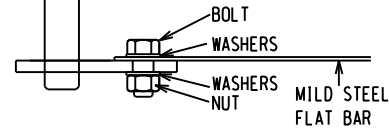
EXTEND AND BRAZE COPPER  
END TO MAIN EARTH GRID



SECTION A-A

HD RODS

NB: APPLY ANTI-OXIDIZING  
COMPOUND BETWEEN THE  
WASHER/MILD STEEL AND  
50 X 3mm FLAT COPPER



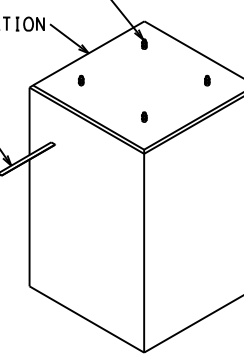
DETAIL A  
EARTHING CONNECTION DETAIL

### NOTES:

1. FOUNDATION EARTHING METHODS VARY ACCORDING TO THE TYPE OF FOUNDATION.
2. FOR DETAILED FOUNDATION EARTHING, SEE MAIN SUBSTATION EARTH GRID LAYOUT DRAWING AND FOUNDATION DETAIL.
3. BOLT THE 50 x 3mm EARTH TAIL TO THE MILD STEEL PLATE WITH A BOLT, NUT & 2 WASHERS.
4. FOUNDATION EARTH TAILS ARE TO BE CONNECTED TO DIFFERENT ROUND COPPER RODS.
5. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.

M24 H.D. BOLTS  
FOUNDATION

EXTEND AND BRAZE COPPER  
END TO MAIN EARTH GRID



EXTEND AND BRAZE COPPER  
END TO MAIN EARTH GRID

ISOMETRIC VIEW  
(NTS)

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS						
0	FIRST ISSUE				/ /	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



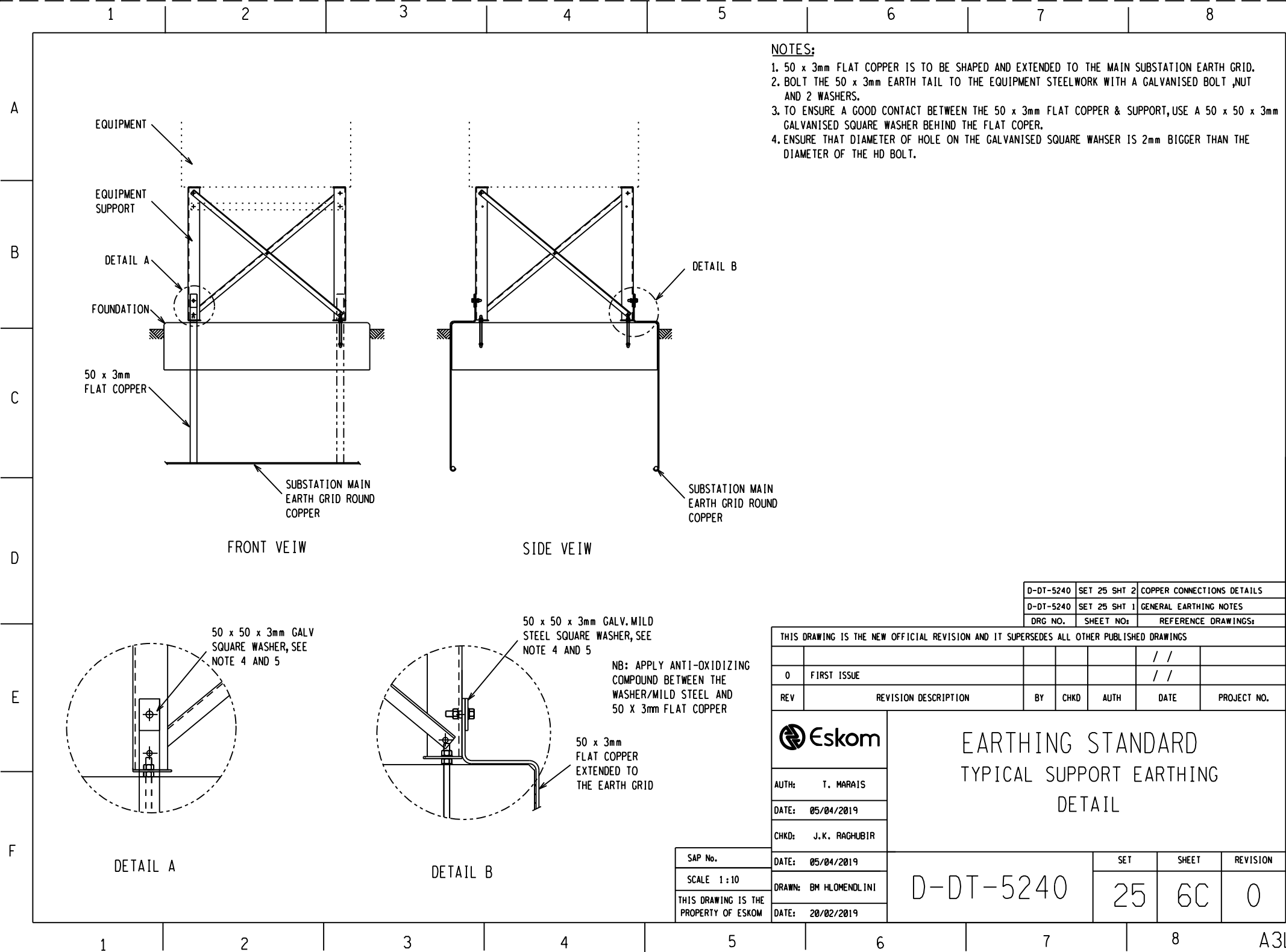
AUTH: T. MARAIS

DATE: 05/04/2019

CHKD: J.K. RAGHUBIR

## EARTHING STANDARD TYPICAL TERTIARY COLUMN FOUNDATION DETAIL


SAP No.	DATE: 20/02/2019	SET	SHEET	REVISION
SCALE 1:10	DRAWN: BM HLOMENDLINI	D-DT-5240		
THIS DRAWING IS THE PROPERTY OF Eskom	DATE: 20/02/2019	25	6B	0



- NOTES:
- 1. 50 x 3mm FLAT COPPER IS TO BE SHAPED AND EXTENDED TO THE MAIN SUBSTATION EARTH GRID.
  - 2. BOLT THE 50 x 3mm EARTH TAIL TO THE EQUIPMENT STEELWORK WITH A GALVANISED BOLT ,NUT AND 2 WASHERS.
  - 3. TO ENSURE A GOOD CONTACT BETWEEN THE 50 x 3mm FLAT COPPER & SUPPORT,USE A 50 x 50 x 3mm GALVANISED SQUARE WASHER BEHIND THE FLAT COPPER.
  - 4. ENSURE THAT DIAMETER OF HOLE ON THE GALVANISED SQUARE WAHSER IS 2mm BIGGER THAN THE DIAMETER OF THE HD BOLT.

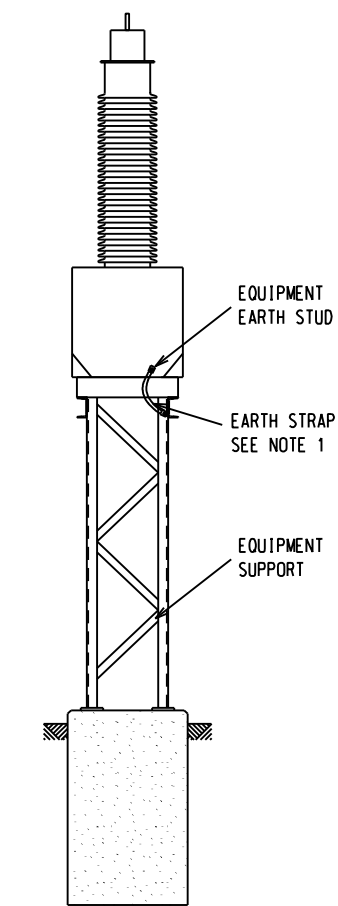
D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS						
0	FIRST ISSUE				/ /	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

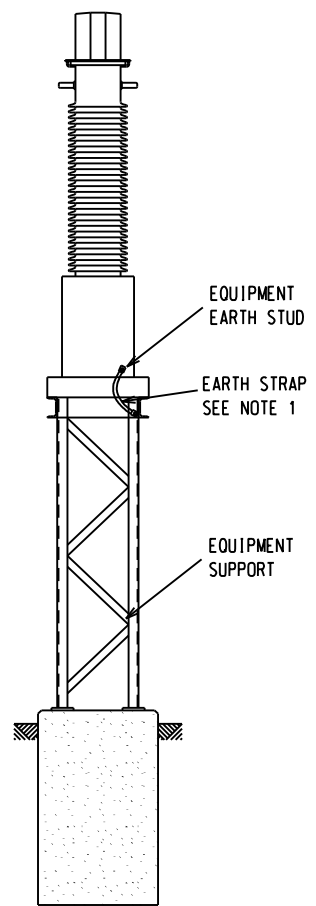
 Eskom		EARTHING STANDARD TYPICAL SUPPORT EARTHING DETAIL			
AUTH: T. MARAIS					
DATE: 05/04/2019					
CHKD: J.K. RAGHUBIR					
DATE: 05/04/2019		D-DT-5240	SET	SHEET	REVISION
DRAWN: BM HLOMENDLINI			25	6C	0
DATE: 20/02/2019					

SAP No.	DATE: 05/04/2019
SCALE 1:10	DRAWN: BM HLOMENDLINI
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE: 20/02/2019

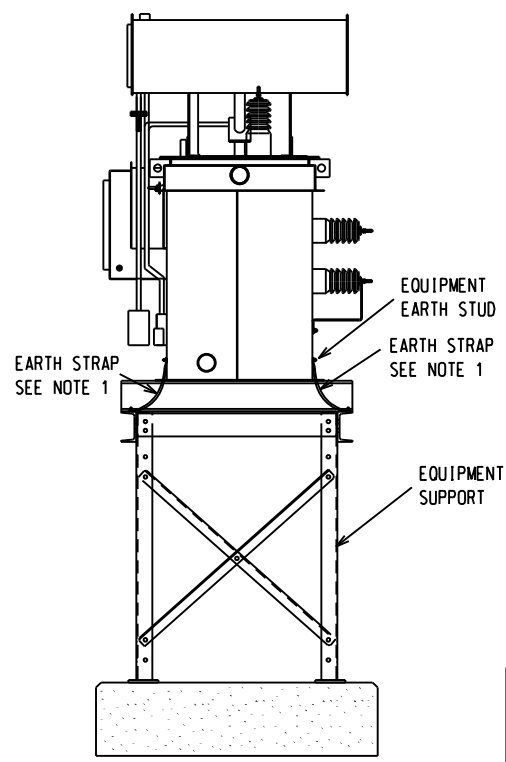
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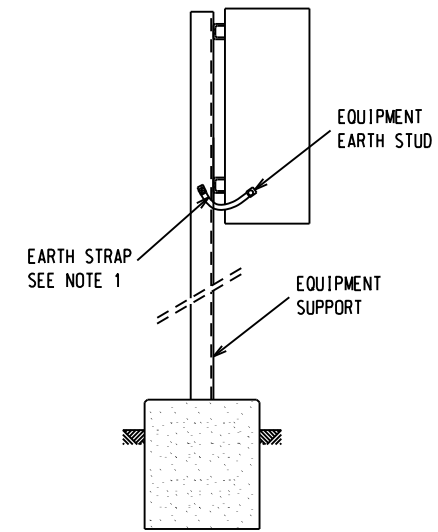
VOLTAGE TRANSFORMER  
SIDE VIEW



CURRENT TRANSFORMER  
SIDE VIEW



NEC/NER/AUX TRANSFORMER  
SIDE VIEW



JUNCTION BOX / YARD AC BOX  
SIDE VIEW

NOTES:

1. 150mm<sup>2</sup> (300A) UV PROTECTED FLEXIBLE COPPER LEADS WITH 16mm LUGS ARE TO BE USED TO EARTH THE EQUIPMENT TO THE EQUIPMENT SUPPORT. ALL LUGS TO HAVE HEAT SHRINK COVERING OF 70mm, THE NON-CONNECTED AREA IS TO BE COVERED WITH THE HEAT SHRINK SLEEVE.
2. USE A M16 GALVANISED BOLT, NUT AND 2x WASHERS TO CONNECT THE FLEXIBLE LEAD ON THE EQUIPMENT STEELWORK.
3. CHECK EQUIPMENT EARTHING STUD BOLT SIZE PRIOR TO SUPPLY AND INSTALLING THE EQUIPMENT LUG, NUT AND WASHERS.
4. STEELWORK TO BE USED FOR EARTH PATH.
5. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

2	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T. MARAIS	05/04/2019	/ /
1	DESCRIPTION FOR CONNECTION TO EARTH MAT UPDATED SHEET RE-NUMBERED FROM SHEET 3 TO SHEET 7.	DJL	CBC	CBC	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



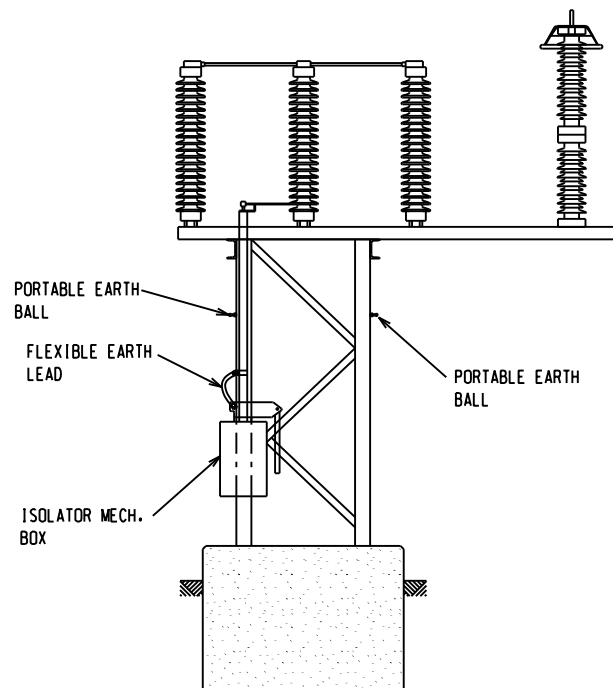
EARTHING STANDARD  
POST TYPE VT, CT AND JB  
EARTHING DETAIL

AUTH: J.F. SCHOLTZ  
DATE: 12/05/2003  
CHKD: J.F. SCHOLTZ

SAP No.	DATE: 12/05/2003
SCALE 1:10	DRAWN: J.F. SCHOLTZ
THIS DRAWING IS THE PROPERTY OF ESKOM	DATE: 09/12/2002

D-DT-5240


SET	SHEET	REVISION
25	7	2

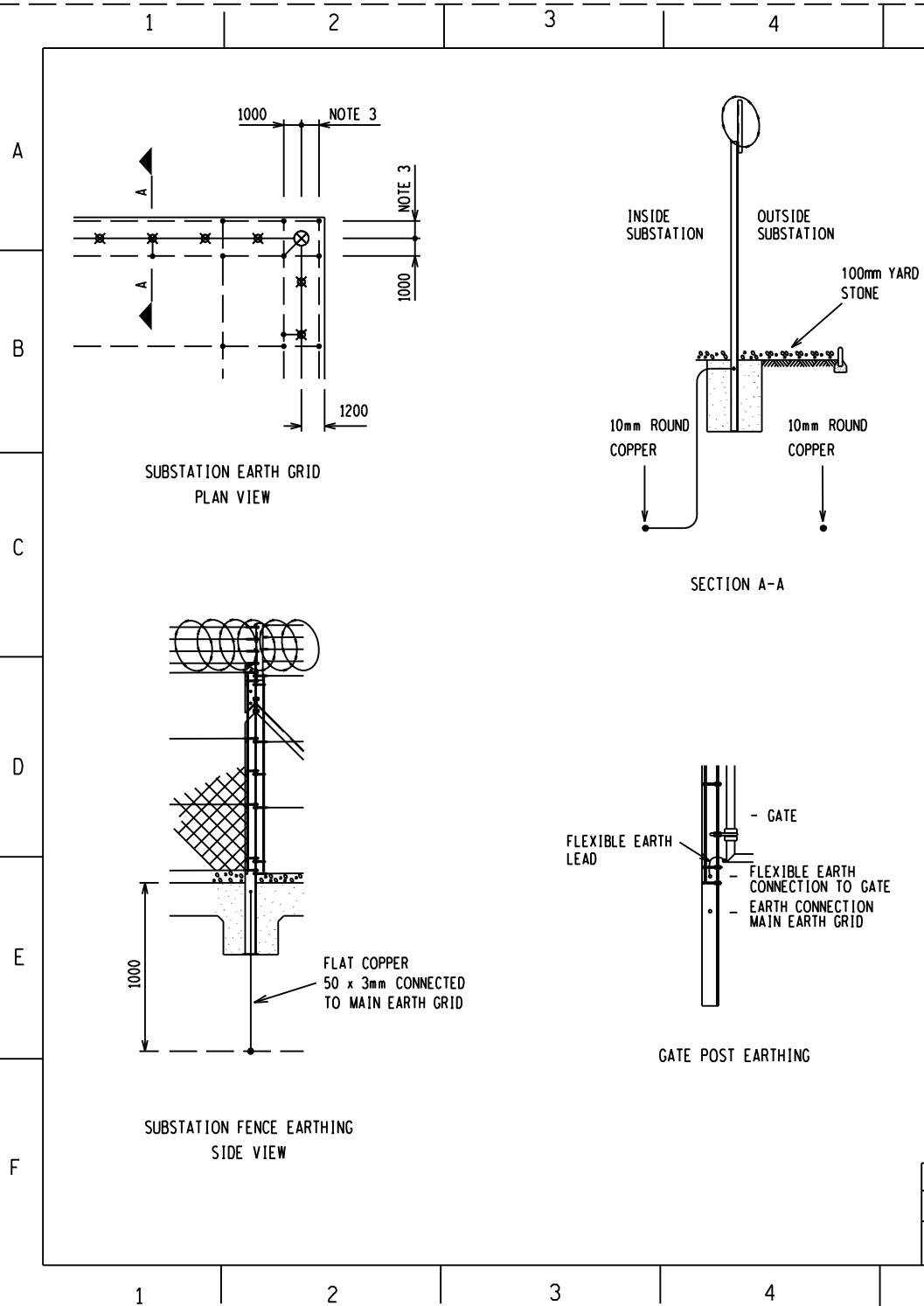


# NOTES:

1. INSTALL PORTABLE EARTHING BALLS (SEE D-DT-6081 SET 1 SHT 1) ON THE EQUIPMENT SUPPORT AS INDICATED ON THE MAIN SUBSTATION EARTH GRID LAYOUT OR OTHERWISE STATED.
2. THE ISOLATOR MECHANICAL BOX AND HANDLE IS TO BE EARTHED IN ACCORDANCE WITH ISOLATOR MANUFACTURE'S SPECIFICATION.
3. STEELWORK TO BE USED FOR EARTH PATH.
4. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.

D-DT-6081	SET 1 SHT 1	PORTABLE EARTHING BALLS
D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS						
2	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T.MARAIS	/ /	
1	DESCRIPTION FOR CONNECTION TO EARTH MAY UPDATED SHEET RE-NUMBERED FROM SHEET 4 TO SHEET 8.	DJL	CBC	CBC	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
 Eskom		EARTHING STANDARD TYPICAL ISOLATOR WITH SURGE ARRESTOR EARTHING ARRANGEMENT				
AUTH: J.F. SCHOLTZ						
DATE: 12/05/2003						
CHKD: J.F. SCHOLTZ						
DATE: 12/05/2003		D-DT-5240		SET	SHEET	REVISION
DRAWN: J.F. SCHOLTZ				25	8	2
DATE: 09/12/2002						



DRAWING SCHEDULE	
LEGEND	DESCRIPTION
---	MAIN EARTH MAT - Ø10mm ROUND COPPER BURIED BELOW GROUND LEVEL
---	EARTH TAILS 3mm x 50mm FLAT COPPER STRAPS
⊕	BRAZED JOINTS TO BE OXY-ACETYLENE BRAZED USING 3mm Ø SILBRALLOY
⊗	SUBSTATION SECURITY FENCE
---	STONE KERB

- NOTES:**
- ESKOM SECURITY FENCE EARTHING AT INTERVALS NOT EXCEEDING 20m.
  - THE MAIN EARTH GRID SHOULD RUN ON THE INSIDE AND OUTSIDE OF THE SUBSTATION SECURITY FENCE AS INDICATED ON THE SUBSTATION EARTH GRID PLAN VIEW.
  - THE OUTER GRID IS TO BE BETWEEN 600mm AND 1000mm OUTSIDE THE SUBSTATION SECURITY FENCE AS SPECIFIED ON THE EARTH GRID LAYOUT.
  - ALL GATE POSTS AND EXTERNAL SECURITY FENCE CORNER POSTS ARE TO BE EARTH WITH 50 x 3mm FLAT COPPER EXTENDED TO THE MAIN SUBSTATION EARTH GRID.
  - BRING EARTH TAILS UP TO THE FENCE POST FROM THE MAIN EARTH GRID AND BOLT TO THE FENCE POST USING M16 GALVANISED BOLTS, NUT AND 2x WASHERS OR UNLESS OTHERWISE STATED.
  - FOR NON-METAL FENCES OR WALLS, THE EARTH GRID DOES NOT REQUIRE TO EXTEND BEYOND THE SUBSTATION PERIMETER.
  - 70mm<sup>2</sup> (150A) UV PROTECTED FLEXIBLE COPPER LEADS WITH 16mm LUGS ARE TO BE USED TO EARTH THE GATE TO THE GATE POST USING M16 GALVANISED BOLT, NUT AND 2x WASHERS. ALL LUGS TO HAVE HEAT SHRINK COVERING OF 70mm, THE NON-CONNECTED AREA IS TO BE COVERED WITH THE HEAT SHRINK SLEEVE.
  - ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.
  - WHERE UNDERGROUND CONNECTIONS ARE MADE TO GALVANISED STEELWORK, THE COPPER SURFACE HAS TO BE TINNED AND COAT WITH ANTI-OXIDIZING ELECTRICAL COMPOUND.  
ALL TINNED COPPER MUST BE TREATED AS DESCRIBED PRIOR TO MAKING A CONNECTION  
A) WASH AND BRUSH TINNED AREA IN WATER AFTER TINNING;  
B) APPLY THIN LAYER OF NON-OXIDE GREASE ONLY TO TINNED AREAS FACING GALV STEELWORK.

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS					
4	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T.MARAI	05/04/2019
3	DIMENSIONS ON MAIN EARTH GRID CHANGED	P.A.T.	T.M.	V. SINGH	27/02/2012
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE
					PROJECT NO.

**EARTHING STANDARD  
SAFETY FENCE EARTHING  
DETAIL**

AUTH: C. CLARK

DATE: 05/11/2004

CHKD: C. CLARK

DATE: 05/11/2004

DRAWN: V VAN ZWEEL

DATE: 01/11/2004

**D-DT-5240**

SET	SHEET	REVISION
25	9	4

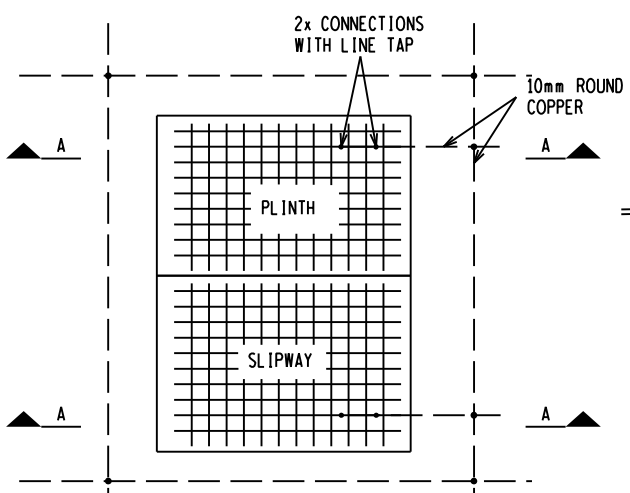
SAP No.

SCALE 1:10

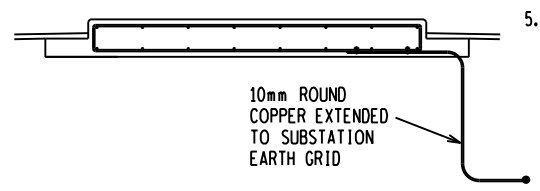
THIS DRAWING IS THE PROPERTY OF ESKOM

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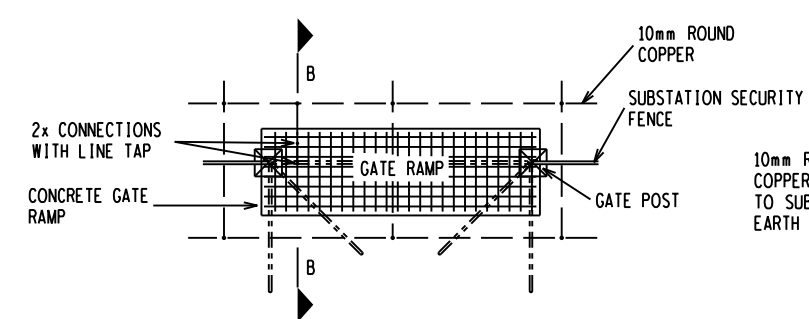
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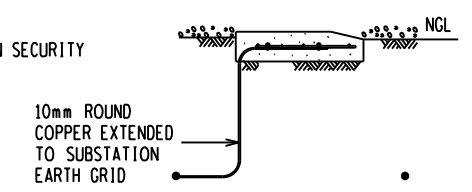
TRANSFORMER PLINTH AND SLIPWAY REINFORCEMENT MESH PLAN VIEW (FRONT ENTRY TRANSFORMER PLINTH)



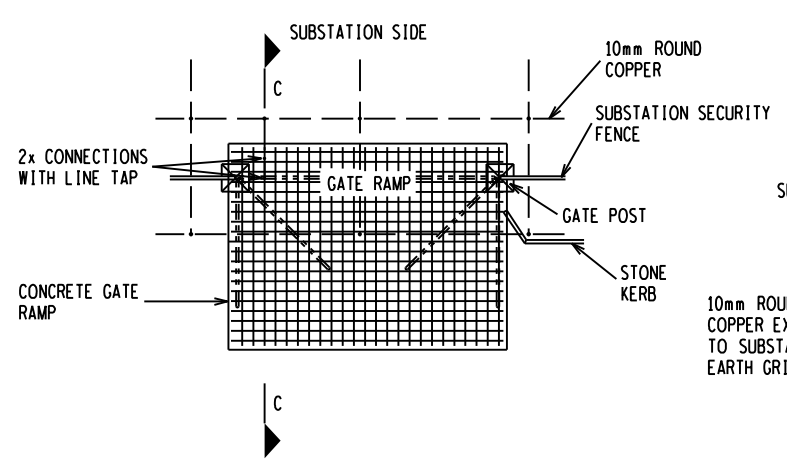
SECTION A-A



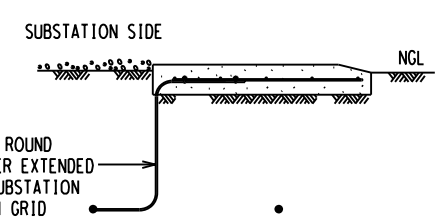
INTERNAL GATE RAMP REINFORCEMENT MESH PLAN VIEW



SECTION B-B



EXTERNAL GATE RAMP REINFORCEMENT MESH PLAN VIEW



SECTION C-C

NOTES:

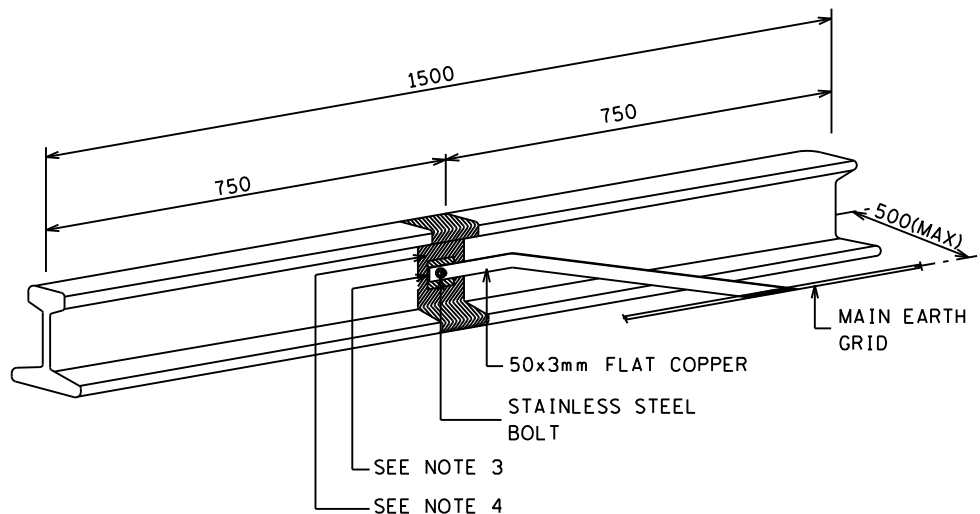
1. REINFORCING MESH WILL BE BONDED TO THE MAIN EARTH GRID ON ONE SIDE ONLY.
2. A MINIMUM OF TWO CONNECTIONS BETWEEN THE 10mm ROUND COPPER AND THE REINFORCEMENT BAR MUST BE DONE WITH A LINE TAP CLAMP (D-DT-3048) COATED WITH NON-OXIDE GREASE BEFORE CONNECTION.
3. TRANSFORMER PLINTH VARY ACCORDING TO THE ENTRY ARRANGEMENT AND SIZE OF THE TRANSFORMER TO BE INSTALLED, SEE SET D-DT-5232 FOR CIVIL DETAIL.
4. REINFORCED LEAF CONCRETE GATE RAMP SHOULD EXTEND BY THE LENGTH OF THE GATE LEAF PLUS 600mm BEYOND THE SUBSTATION MAIN GATE, FOR EXTERNAL GATES ONLY.
5. ALL CIVIL WORKS FOR EXTERNAL, INTERNAL AND SLIDING GATE RAMPS TO CONFORM TO D-DT-5237.

DRG NO.	SHEET NO.	REFERENCE DRAWINGS
D-DT-3048	SET 1 SHT 1	LINE TAP CLAMP
D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES

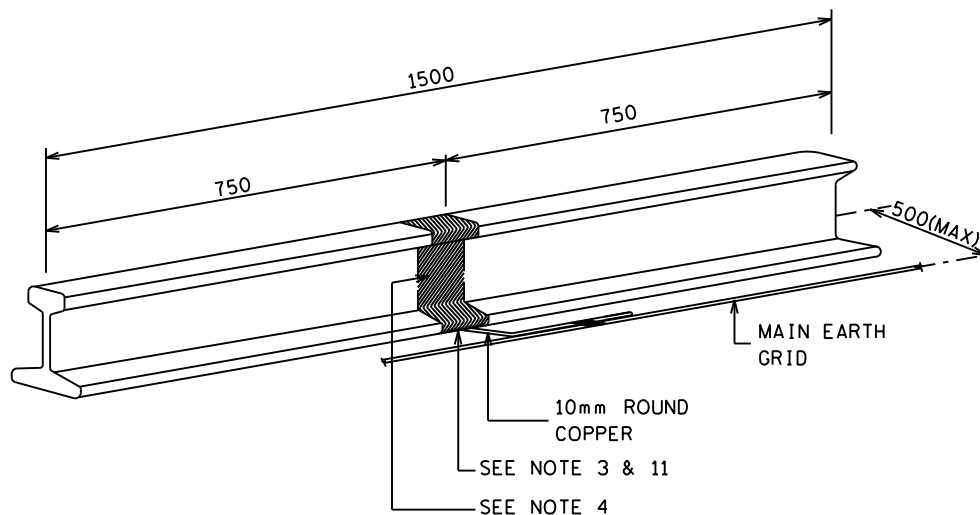
THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS					
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE
2	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T.MARAIS	05/04/2019
1	DESCRIPTION EARTH MAT UPDATED TO EARTH GRID. BOLTED CLAMP REVISED	DJL	CBC	CBC	13/03/2006

		EARTHING STANDARD REINFORCING EARTHING DETAIL		
D-DT-5240		SET	SHEET	REVISION
		25	10	2

SAP No.	DATE: 13/03/2006
SCALE 1:10	DRAWN: D.D. NGEGE
THIS DRAWING IS THE PROPERTY OF Eskom	DATE: 15/03/2005



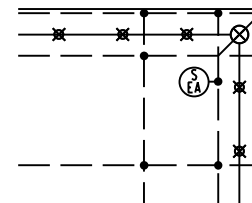
OPTION 1: SACRIFICIAL EARTH ANODE  
ISOMETRIC VIEW



OPTION 2: SACRIFICIAL EARTH ANODE  
ISOMETRIC VIEW

#### NOTES:

1. THE NUMBER AND POSITIONS OF THE SACRIFICIAL EARTH GRID ANODE IS TO BE INDICATED AS (EA) ON THE SUBSTATION EARTH GRID LAYOUT DRAWING.
  2. 57KG STEEL RAIL, FOR AREAS WHERE SOIL CONDITIONS ARE MILDLY TO SEVERELY CORROSIVE.
  3. CONTACT AREA OF APPROX. 80 x 80mm IS TO BE SCRAPED OF ON ONE SIDE OF THE ANODE TO EXPOSE THE CLEAN METAL.
  4. A STRIP OF APPROX. 150mm WIDE AROUND THE CENTER PORTION OF THE RAIL (WHICH INCLUDES THE CONNECTION PORTION) IS TO BE PAINTED WITH BITUMEN PAINT.
  5. SACRIFICIAL EARTH GRID ANODE TO BE BURIED 1000mm BELOW GROUND LEVEL IN A SEPERATE TRENCH FROM THE 10mm ROUND COPPER.
  6. USE EITHER OPTION 1 OR OPTION 2 TO CONNECT SACRIFICIAL ANODE TO THE MAIN EARTH GRID AS STATED BELOW.
- OPTION 1**
7. DRILL THE A 18mm HOLE ON THE POSITION INDICATED ON THE DRAWING.
  8. USE A 16mm STAINLESS STEEL BOLT, NUT AND 2 WASHERS TO BOLT THE 50x3mm FLAT COPPER ON THE STEEL RAIL.
  9. 50 x 3mm FLAT COPPER IS TO BE SHAPED AND EXTENDED TO THE MAIN SUBSTATION EARTH GRID.
  10. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.
- OPTION 2**
11. 10mm ROUND FLAT COPPER IS TO BE EXOTHEMIC WELDED TO THE STEEL RAIL.



TYPICAL SUBSTATION EARTH GRID TRENCH  
PLAN VIEW

D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO:	REFERENCE DRAWINGS:

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS						
2	COMPLETE DRAWING AND DETAIL REVISION	BMH	JKR	T.MARAIS	05/04/2019	
1	DESCRIPTION EARTH MAT UPDATED TO EARTH GRID SHEET RE-NUMBERED FROM SHEET 13 TO SHEET 11.	DJL	CBC	CBC	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: D.C.R.

DATE: 09/12/2002

## EARTHING STANDARD SACRIFICIAL EARTH GRID ANODE DETAIL

D-DT-5240

SET	SHEET	REVISION
25	11	2

SAP No.	
SCALE :	
THIS DRAWING IS THE PROPERTY OF ESKOM	

1

2

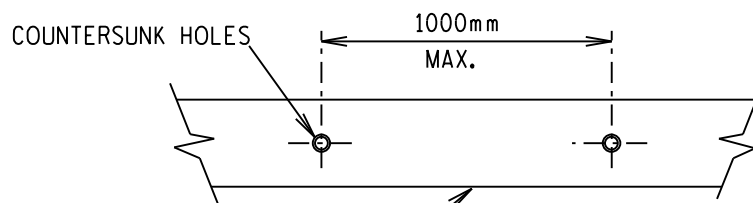
3

4

## EARTH STRAP FIXING - DETAIL 'A'

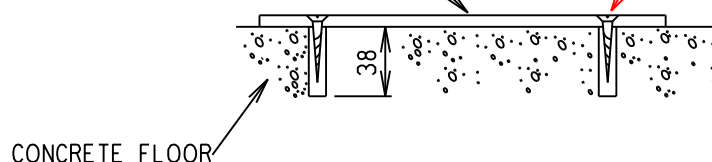
USED WHERE STRAP HAS  
TO RUN ON TOP OF  
FINISHED FLOOR IN  
WALKWAYS OR UP AGAINST  
THE WALL.  
ONLY COUNTERSUNK  
SCREWS TO BE USED.

A



COUNTERSUNK  
RAWLBOLT (OR  
EQUIVALENT)

B

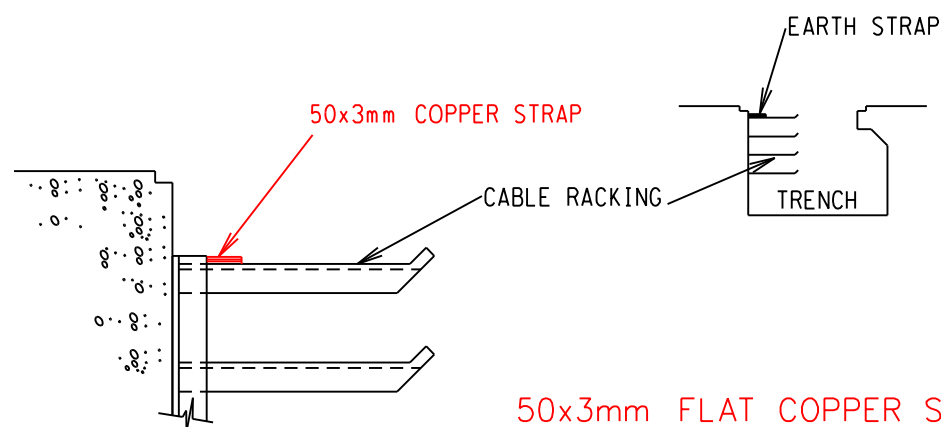


A

B

## CONTROL ROOM TRENCH EARTH STRAP - DETAIL 'B'

C



50x3mm FLAT COPPER STRAP TO BE  
LAID ON TOP CABLE RACK AND FIXED  
AT EVERY SECOND RACK

C

D

D

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

2	REVISED CABLE RACK EARTHING METHOD	BMH	JKR	T.MARAIS	05/04/2019	
1	DESCRIPTION EARTH MAT UPDATED TO EARTH GRID BOLTED CLAMP REVISED.	DJL	CBC	CBC	13/03/06	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

E

E



# EARTHING STANDARD

## EARTH STRAP FIXING DETAILS

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 09/12/2002

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D-DT-5240

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REVISION

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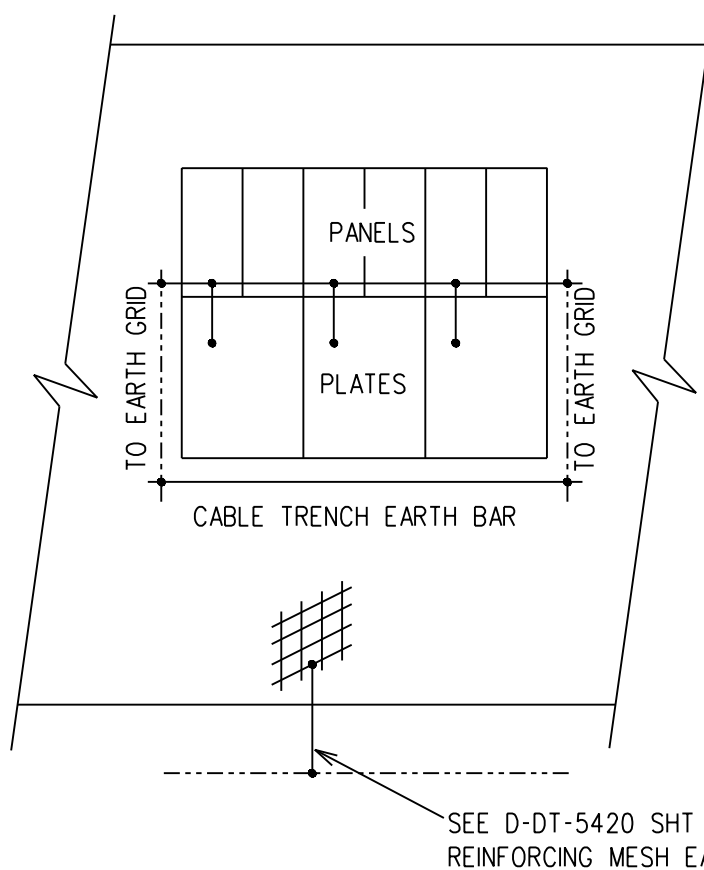
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#### GENERAL NOTES:

1. MESH IN CONCRETE TO BE EARTHED AT ONE PLACE ONLY TO MAIN EARTH GRID.
2. THE CIVIL CONTRACTOR IS TO ENSURE THE MESH IN THE FLOOR IS CONTINUOUS.
3. IF APPLICABLE, PLATES TO BE SUPPLIED BY SWITCHGEAR MANUFACTURE AS PER D-DT-5238.

#### EARTH GRID CONNECTION:

1. SWITCHGEAR TO BE EARTHED IN ACCORDANCE WITH THE OEM REQUIREMENTS/RECOMMENDATION OR TYPE TESTED EARTHING DESIGN WHERE AVAILABLE.
2. IN THE ABSENCE OF THIS INFORMATION, APPLY TWO EARTH CONNECTIONS TO A COMBINATION OF SWITCHGEAR PANELS UP TO A LENGTH OF 15M.

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2	UPDATED DRAWING NOTES	BMH	JKR	T. MARAIS	05/04/2019	
1	SHEET RE-NUMBERED FROM SHEET 11 TO SHEET 13	DJL	CBC	CBC	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



## EARTHING STANDARD EARTHING OF SWITCH GEAR

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 10/12/2002

D-DT-5240

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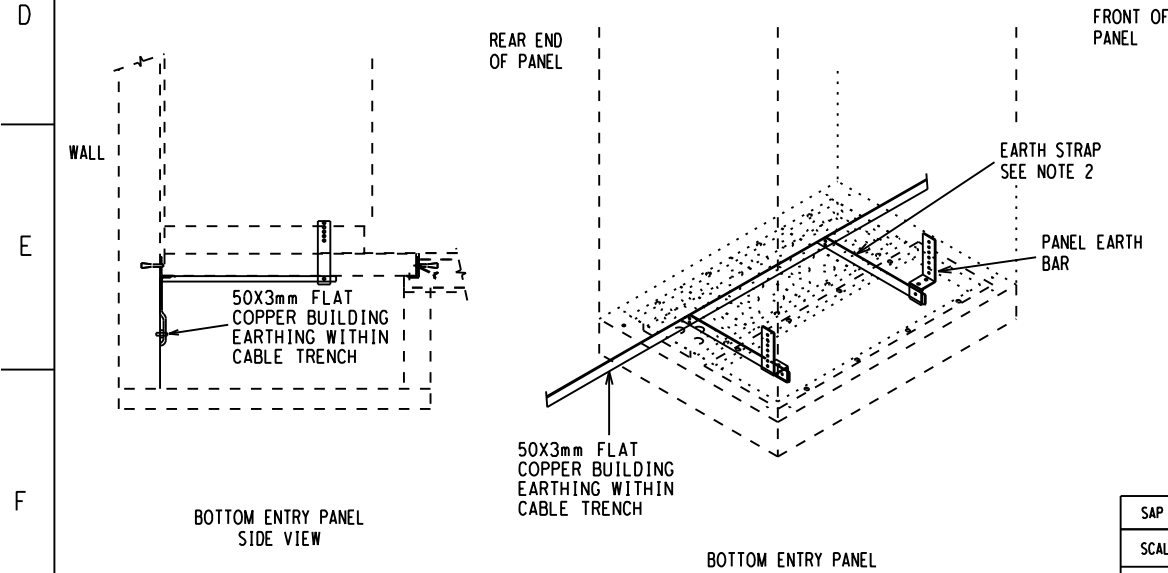
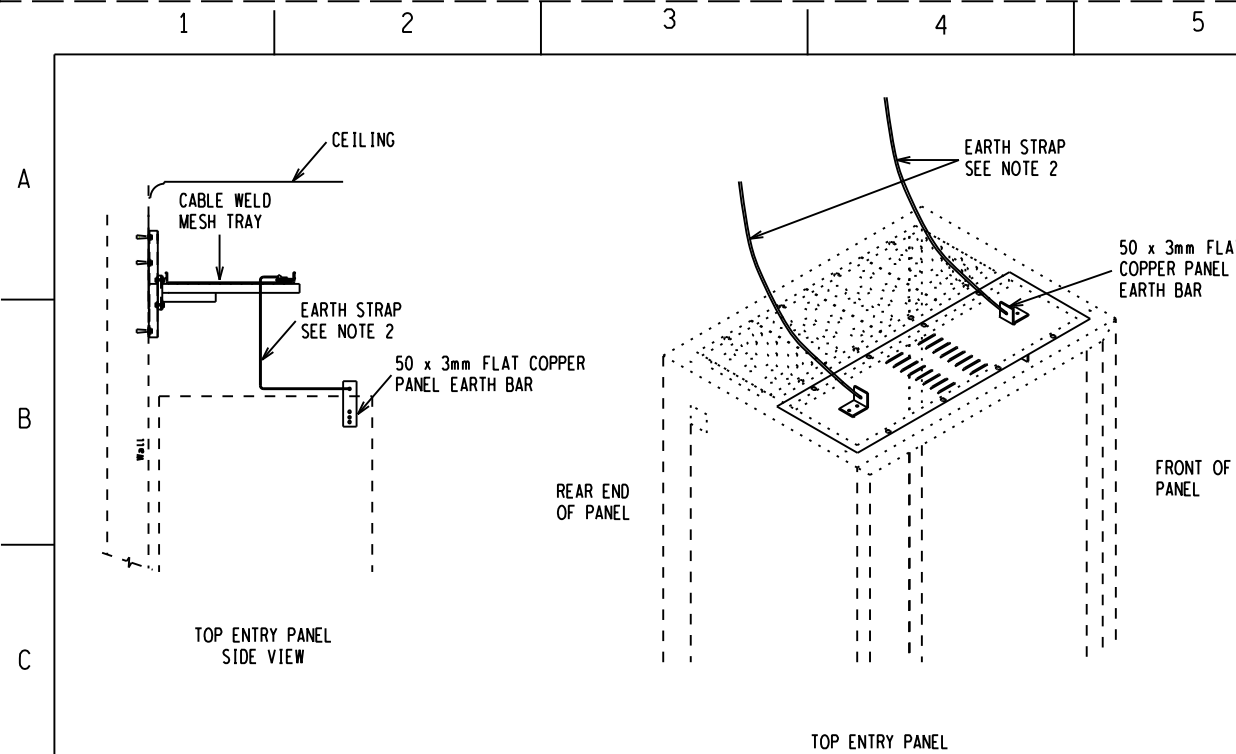
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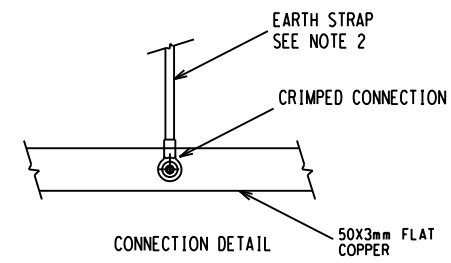
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**NOTES:**

1. SWING FRAME CABINET EARTHING SHOULD BE DONE AS PER STANDARD 240-64100247 AND D-DT-5400.
2. EACH PANEL TO BE EARTHED USING A 25mm WIDE COPPER STRAP OR BRAID OR ROUND BAR WITH ATLEAST 75mm<sup>2</sup> COSS-SECTIONAL AREA. IF THE DISTANCE FROM THE PANEL TO THE TRENCH EXCEEDS 5m THEN TWO PARALLEL STRAPS, SEPERATED BY THE WIDTH OF THE CABINET MUST BE USED.
3. FOR CONTROL BUILDING EARTHING, SEE CONTROL BUILDING EARTHING DRAWING/LAYOUT.
4. ALL EARTHING IN THE PANEL SHOULD BE DONE IN ACCORDANCE WITH STANDARD 240-64100247.
5. IF A 25 x 3mm FLAT COPPER IS USED, EACH 25 x 3mm FLAT COPPER IS TO BE BOLTED TO THE BUILDING EARTHING CONDUCTOR AND PANEL EARTH BAR WITH A M12 STAINLESS BOLT, NUT AND 2 WASHERS TO CONNECT THE 25 x 3mm FLAT.
6. WHERE FLEXIBLE EARTH STRAPS ARE USED. EACH FLEXIBLE EARTH STRAP IS TO BE LUGGED TO THE BUILDING EARTHING CONDUCTOR AND PANEL EARTH BAR AS INDICATED ON THE DETAIL BELOW.



D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS					
3	COMPLETE DRAWING & DETAIL REVISION	BMH	JKR	T. MARAIS	05/04/2019
2	SWING FRAME CABINET SPEC. NO. CORRECTED	P.A.T.	T. M.	V. SINGH	27/02/2012
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE
					PROJECT NO.



# EARTHING STANDARD CONTROL PANEL EARTHING DETAIL

AUTH: C. CLARK  
DATE: 13/03/2006  
CHKD: C. CLARK

SAP No.  
SCALE 1:10  
THIS DRAWING IS THE PROPERTY OF Eskom  
DATE: 11/03/2005

DATE: 13/03/2006	SET	SHEET	REVISION
DRAWN: NGEDE D.D.	D-DT-5240	25	14
DATE: 11/03/2005			3

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## OUTGOING CABLES

ALUMINIUM TAPE SCREEN  
UNDER THE BOOT

INNER SHEATH

GLAND PLATE

THERMOPLASTIC  
SHEATH

BOOT

ONLY ON OUTGOING CABLES  
EARTH DRAIN WIRE TO BE  
CONNECTED TO EARTH LUG IN  
JUNCTION BOX AS SHOWN

TAIL TO EARTH CONNECTION

SOLDERED CONNECTION

SLIP-ON EARTH LUG

## INCOMING CABLES

ONLY ON INCOMING CABLES  
EARTH DRAIN WIRE TO BE  
CUT OFF WITH SCREEN  
UNDER THE BOOT

GLAND PLATE

BOOT

TAIL TO EARTH CONNECTION

SOLDERED CONNECTION

SLIP-ON EARTH LUG

THIS DRAWING IS THE NEW OFFICIAL REVISION. IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS.

2	CHANGED SET NUMBER	BMH	JKR	T.MARAIS	05/04/2019	
1	TITLE BLOCK UPDATED	VvZ	JSF	JSF	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



# EARTHING STANDARD

## ARMoured TELEPHONE & SCREENED CONTROL CABLES

### AT JUNCTION BOX

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 10/12/2002

D-DT-5240

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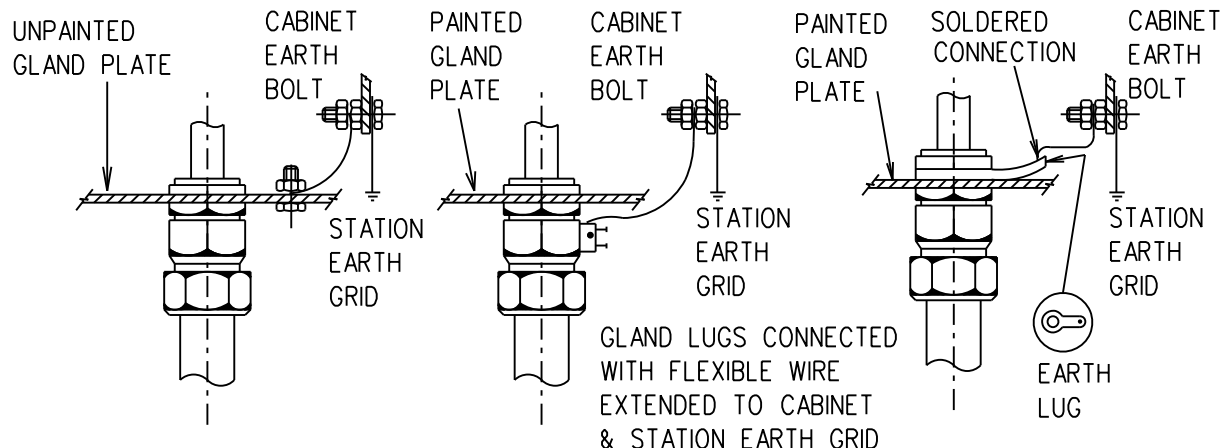
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# ARMoured MULTICORE CONTROL AND TELEPHONE

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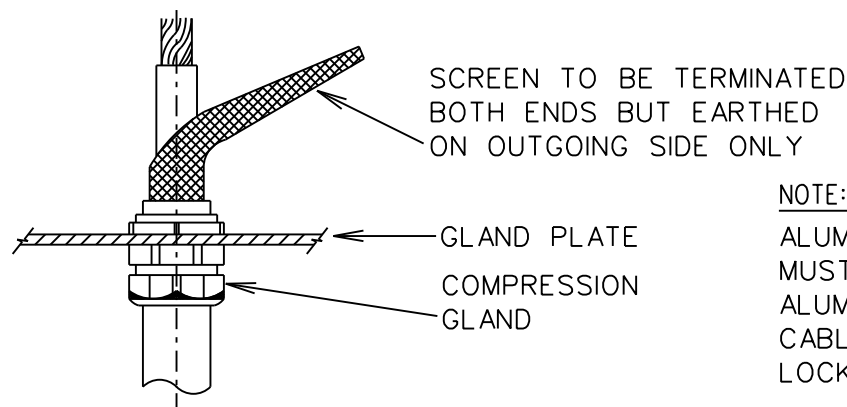


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NOTE :  
CABLE ARMOURING TO BE BONDED AT BOTH SIDES.

## G.P.O. UNARMoured TYPE 'Z' CABLE

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NOTE:  
ALUMINIUM GLANDS MUST BE USED ON ALUMINIUM ARMoured CABLES (DOUBLE LOCK TYPE)

THIS DRAWING IS THE NEW OFFICIAL REVISION. IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS.

2	CHANGED SET NUMBER	BMH	JKR	T. MARAIS	05/04/2019	
1	TITLE BLOCK UPDATED	VvZ	JSF	JSF	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

E



## EARTHING STANDARD ARMoured MULTICORE

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 10/12/2002

## CONTROL & TELEPHONE OR G.P.O. UNARMoured TYPE 'Z' CABLE

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D-DT-5240

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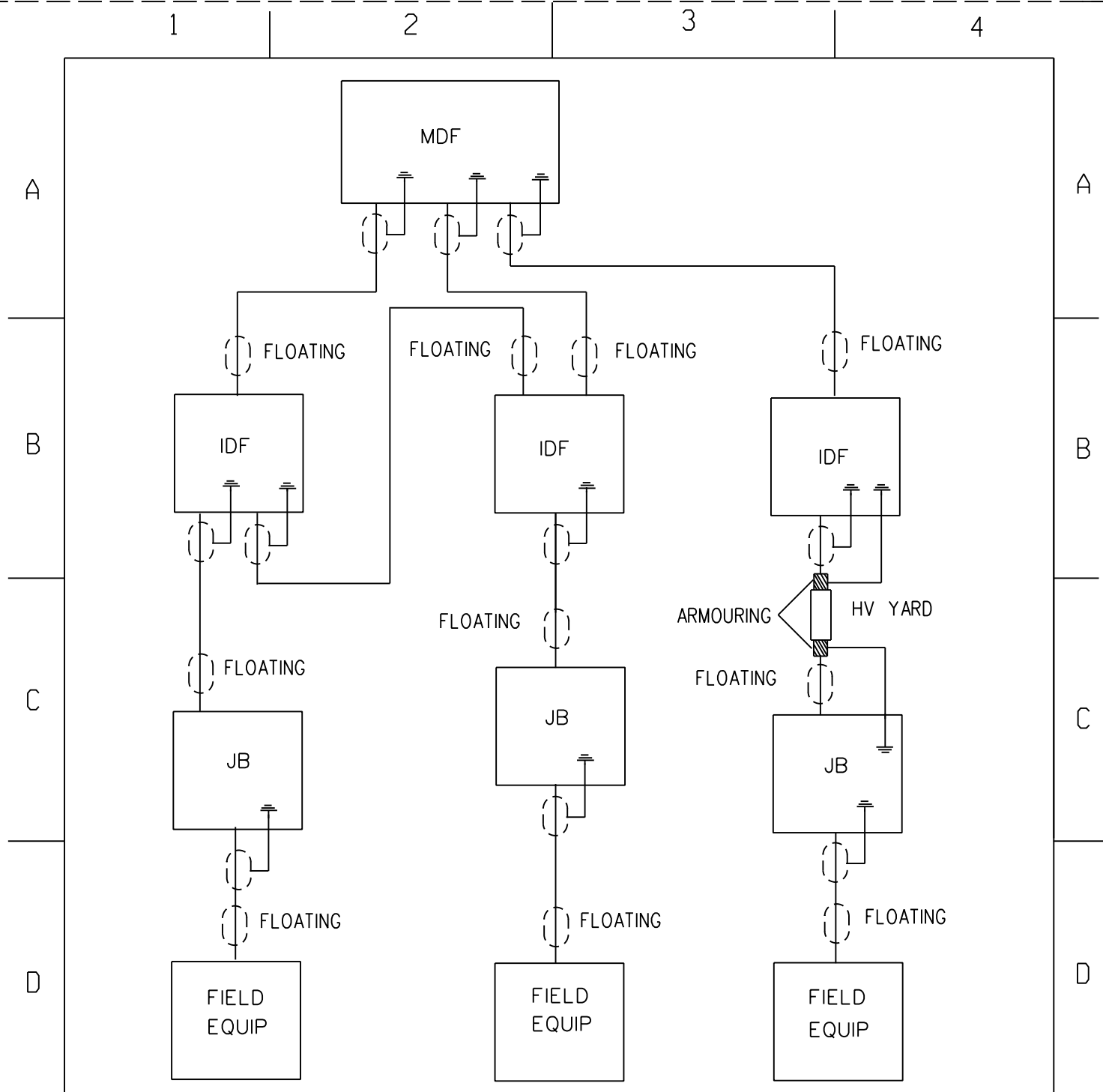
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2	CHANGED SET NUMBER	BMH	JKR	T. MARAIS	05/04/2019	
1	TITLE BLOCK UPDATED	VvZ	JSF	JSF	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



# EARTHING STANDARD

## EARTHING OF TELEPHONE OR PROCESS CONTROL CABLES

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 10/12/2002

# D-DT-5240

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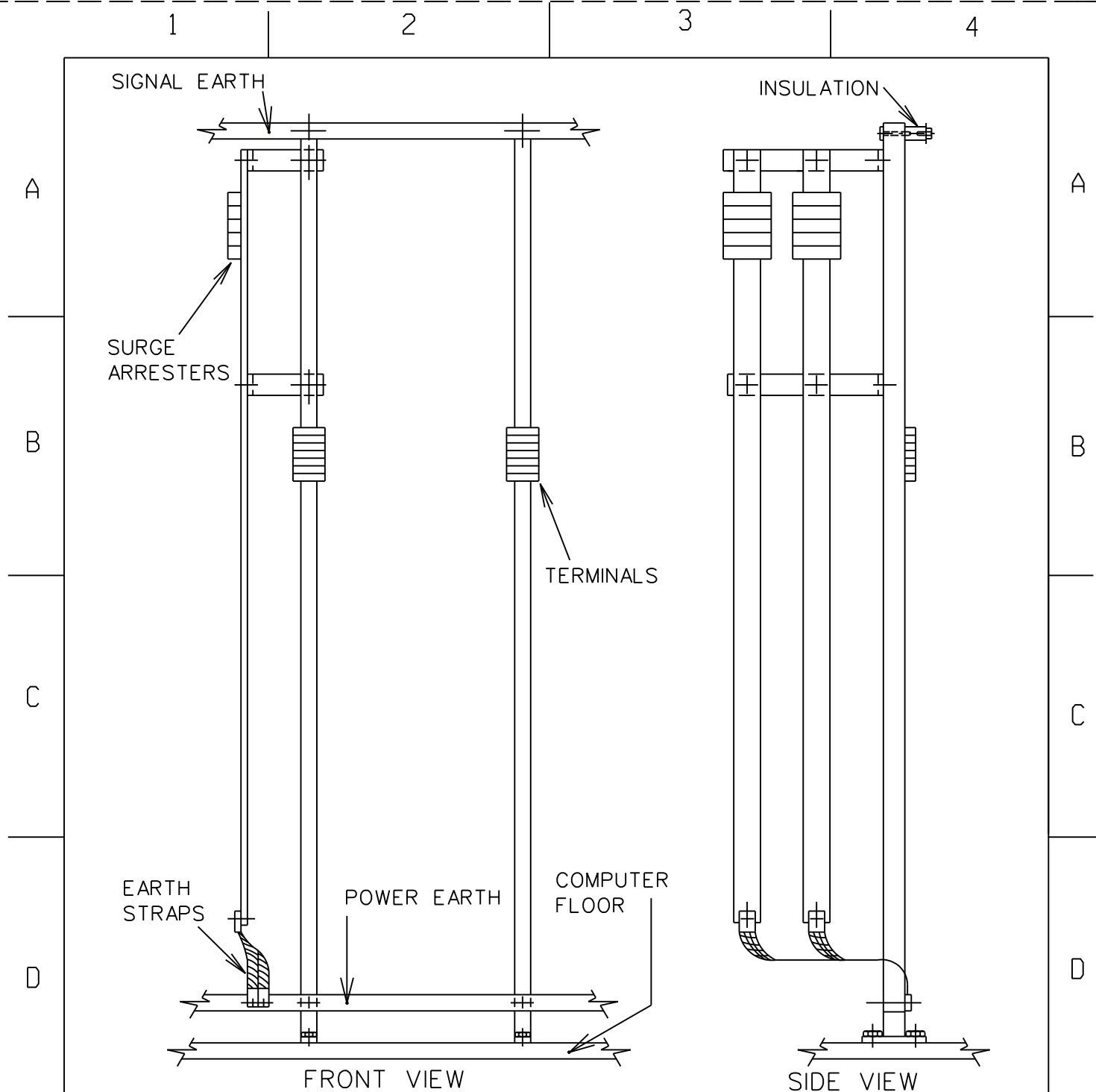
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2	CHANGED SET NUMBER	BMH	JKR	T.MARAIS	05/04/2019	
1	TITLE BLOCK UPDATED	VvZ	JSF	JSF	13/03/2006	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



# EARTHING STANDARD EARTHING OF SIGNAL DISTRIBUTION FRAMES

AUTH: J.F. SCHOLTZ

DATE: 21/05/2003

CHKD: J.F. SCHOLTZ

DATE: 21/05/2003

DRAWN: J.F. SCHOLTZ

DATE: 10/12/2002

D-DT-5240

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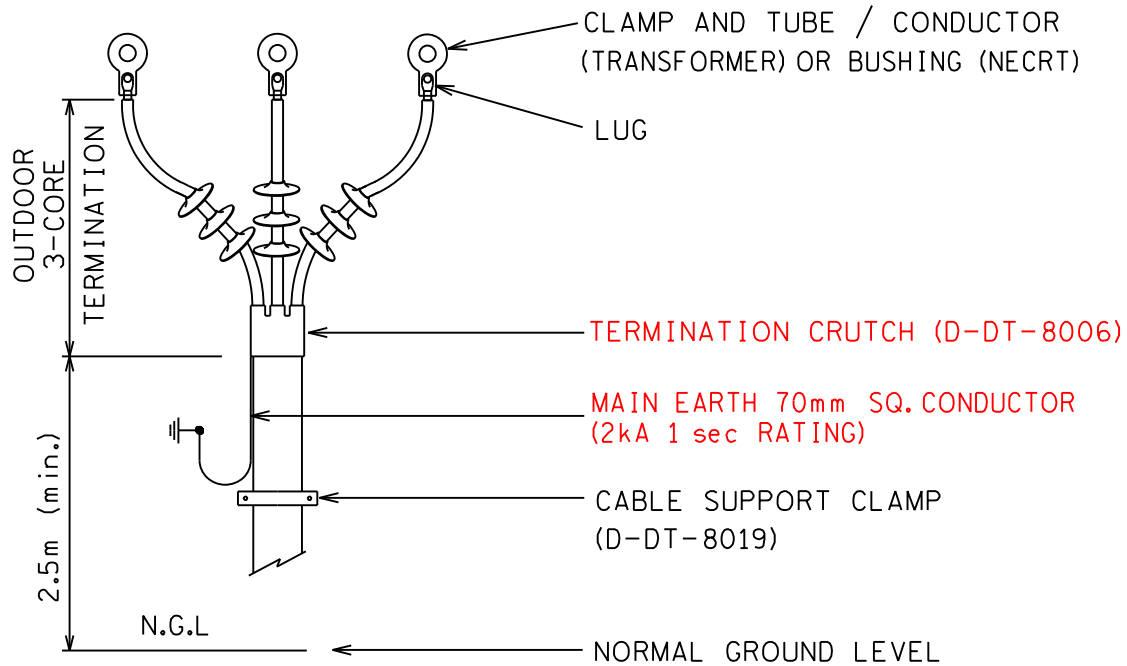
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#### NOTES:

1. MAIN EARTH CONDUCTOR (BRAID) OF CABLE TERMINATION TO BE BONDED TO EARTHED STRUCTURE / NECRT EARTH TERMINAL PROVIDED.
2. 3-CORE CABLE TO BE EARTHED AT BOTH ENDS.
3. EARTHING, BONDING AND TERMINATION SHALL BE DONE IN ACCORDANCE WITH 240-56030619 AND 240-56063710.
4. FOR GENERATION AND TRANSMISSION; FAULT LEVEL MUST BE DETERMINED FOR THE EARTH FAULT CURRENT TO SELECT THE CABLING TYPE AND BRAID SIZE.

THIS DRAWING IS THE NEW OFFICIAL REVISION. IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS.

3	UPDATED DRAWING NOTES	BMH	JKR	T. MARAIS	05/04/2019		
2	TITLE BLOCK UPDATED	P.A.T.	C. BOSCH	T. NKUMBULE	13/03/2006		
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.	
<div></div>		<div>EARTHING STANDARD</div> <div>MV 3-CORE CABLE TERMINATION</div> <div>AT TRANSFORMER / NECRT</div>					
AUTH: R. KELLY							
DATE: 13/03/2006							
CHKD: C.B. CLARK							
DATE: 13/03/2006		D-DT-5240			SET	SHEET	REVISION
DRAWN: D.D.NGECE					25	19	3
DATE: 04/03/2005							

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NOTES:

1. MAIN EARTH CONDUCTOR (BRAID) OF CABLE TERMINATION TO BE BONDED TO EARTHED TERMINAL PROVIDED.
2. 3-CORE CABLE TO BE EARTHED AT BOTH ENDS.
3. EARTHING, BONDING AND TERMINATION SHALL BE DONE IN ACCORDANCE WITH 240-56030619 AND 240-56063710.

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THIS DRAWING IS THE NEW OFFICIAL REVISION. IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS.

2	UPDATED DRAWING NOTES	BMH	JKR	T. MARAIS	05/04/2019	
1	NOTE 3 SPEC. CORRECTED	P.A.T.	T. NKUMBULE	V. SINGH	27/02/2012	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

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E



# EARTHING STANDARD

## MV 3-CORE CABLE TERMINATION

## AT METALCLAD SWITCHGEAR

AUTH:	R. KELLY
DATE:	13/03/2006
CHKD:	C.B. CLARK
DATE:	13/03/2006
DRAWN:	D.D.NGECE
DATE:	04/03/2005

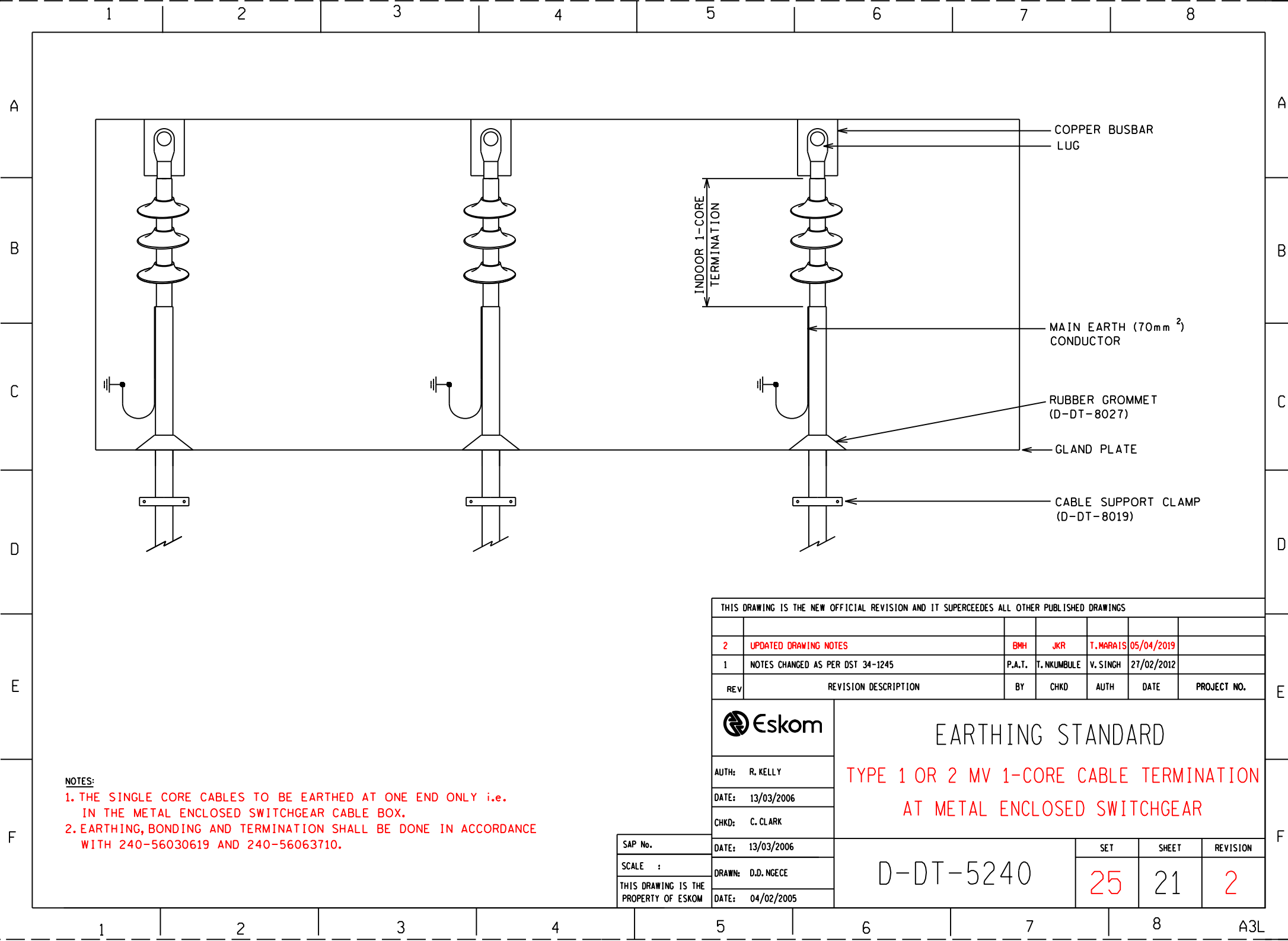
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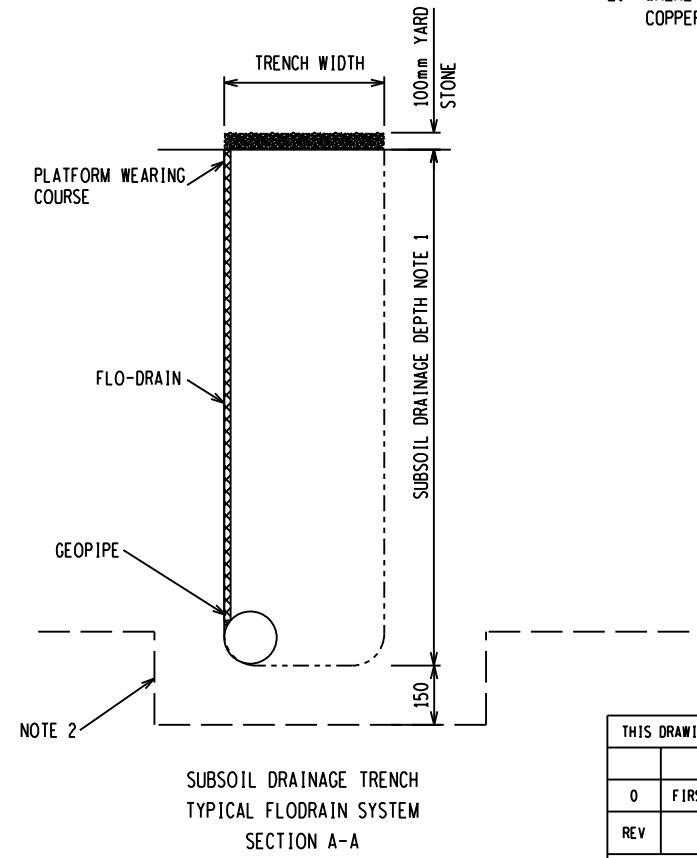
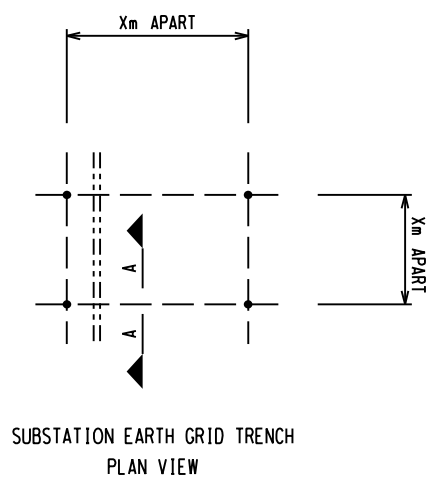
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DRAWING SCHEDULE

LEGEND	DESCRIPTION
— — —	MAIN EARTH MAT - Ø10mm ROUND COPPER BURIED BELOW GROUND LEVEL
=====	SUBSOIL DRAINAGE

- NOTES:
- SUBSOIL DRAINAGE DEPTH IS DEPENDENT ON THE CIVIL ENGINEERING/PLATFORM DESIGN.
  - WHERE THE EARTH GRID CLASHES OR PASSES UNDER SUBSOIL DRAINAGE, THE ROUND COPPER SHOULD BE BURIED 150MM BELOW THE SUBSOIL DRAINAGE SYSTEM.



D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS
D-DT-5240	SET 25 SHT 1	GENERAL EARTHING NOTES
DRG NO.	SHEET NO.	REFERENCE DRAWINGS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
0	FIRST ISSUE				/ /	

EARTHING STANDARD  
SUBSOIL TRENCH  
DETAIL

AUTH: T. MARAIS

DATE: 05/04/2019

CHKD: J. K. RAGHUBIR

SAP No.

SCALE 1:10

THIS DRAWING IS THE  
PROPERTY OF ESKOM

DATE: 05/04/2019

DRAWN: BM HLOMENDLINI

DATE: 20/02/2019

D-DT-5240

SET	SHEET	REVISION
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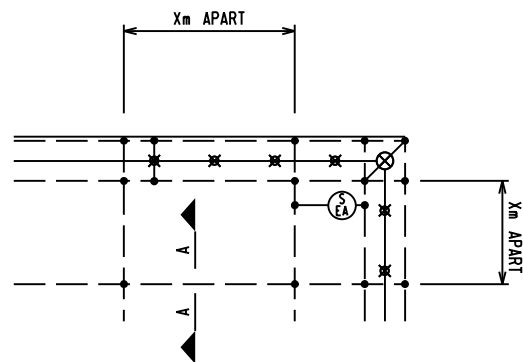
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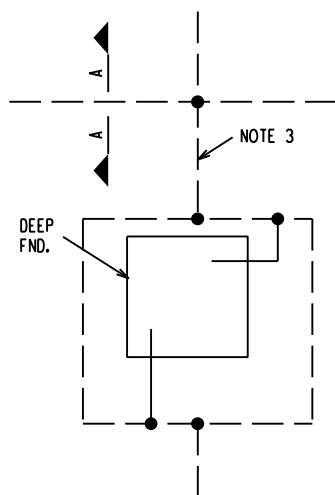
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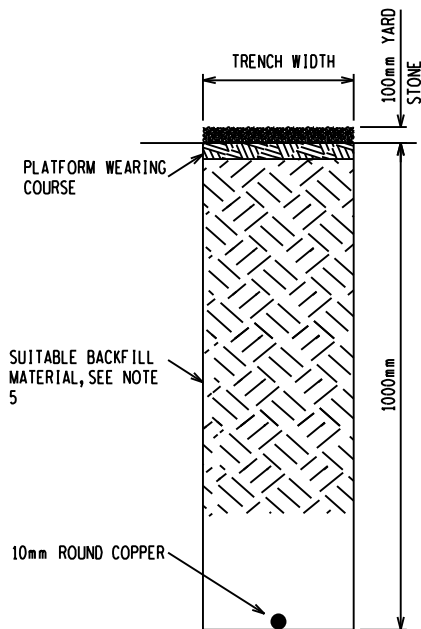
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SUBSTATION EARTH GRID TRENCH  
PLAN VIEW



ROUND AND FOUNDATION CROSSING  
PLAN VIEW  
SCALE 1:5



SUBSTATION EARTH GRID TRENCH  
SECTION A-A

## DRAWING SCHEDULE

LEGEND	DESCRIPTION
— — —	MAIN EARTH MAT - Ø10mm ROUND COPPER BURIED BELOW GROUND LEVEL
— — —	EARTH TAILS 3mm x 50mm FLAT COPPER STRAPS
— — —	JOINTS TO BE OXY-ACETYLENE BRAZED, USING 3mm SOLDER ACCORDING TO STANDARD EN1044 ITEM CP105
⊙	SACRIFICIAL EARTH ANODE, SEE D-DT-5240 SHT 11
— ⊗ —	SUBSTATION SECURITY FENCE

### NOTES:

- ALL CONNECTIONS TO BE DONE AS PER D-DT-5240 SHT 2.
- 10mm DIAMETER ROUND COPPER TO BE BURIED 1000mm BELOW GROUND LEVEL OR UNLESS OTHERWISE SPECIFIED ON THE MAIN SUBSTATION EARTH GRID LAYOUT.
- WHERE ROUND COPPER CLASHES WITH DEEP FOUNDATIONS SUCH AS COLUMN FOUNDATIONS OR OIL DAMS, THE ROUND COPPER SHOULD BE WELDED BE AND EXTENDED AROUND THE FOUNDATION AS INDICATED.
- WHERE THE EARTH GRID IS TO BE LAID IN A ROCKY AREA, BACKFILL 200mm OF SUITABLE MATERIAL AND COMPACT PRIOR TO LAYING THE 10mm ROUND COPPER.
- BACKFILL AND COMPACT THE TRENCHES AT OPTIMUM MOISTURE CONTENT WITH A MECHANICAL PLATE COMPACTOR IN LAYER NOT EXCEEDING 300mm TO A DENSITY OF 93% MOD-AASHTO.

DRG NO.	SHEET NO.	REFERENCE DRAWINGS:
D-DT-5240	SET 25 SHT 11	SACRIFICIAL EARTH GRID ANODE
D-DT-5240	SET 25 SHT 9	SUBSTATION FENCE EARTHING DETAIL
D-DT-5240	SET 25 SHT 2	COPPER CONNECTIONS DETAILS

THIS DRAWING IS THE NEW OFFICIAL REVISION AND IT SUPERSEDES ALL OTHER PUBLISHED DRAWINGS

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
0	FIRST ISSUE				//	



## EARTHING STANDARD EARTH GRID TRENCH DETAIL

AUTH: T. MARAIS

DATE: 05/04/2019

CHKD: J.K. RAGHUBIR

DATE: 05/04/2019

DRAWN: BM HLOMENDLINI

DATE: 20/02/2019

SAP No.

SCALE 1:10

THIS DRAWING IS THE  
PROPERTY OF ESKOM

D-DT-5240

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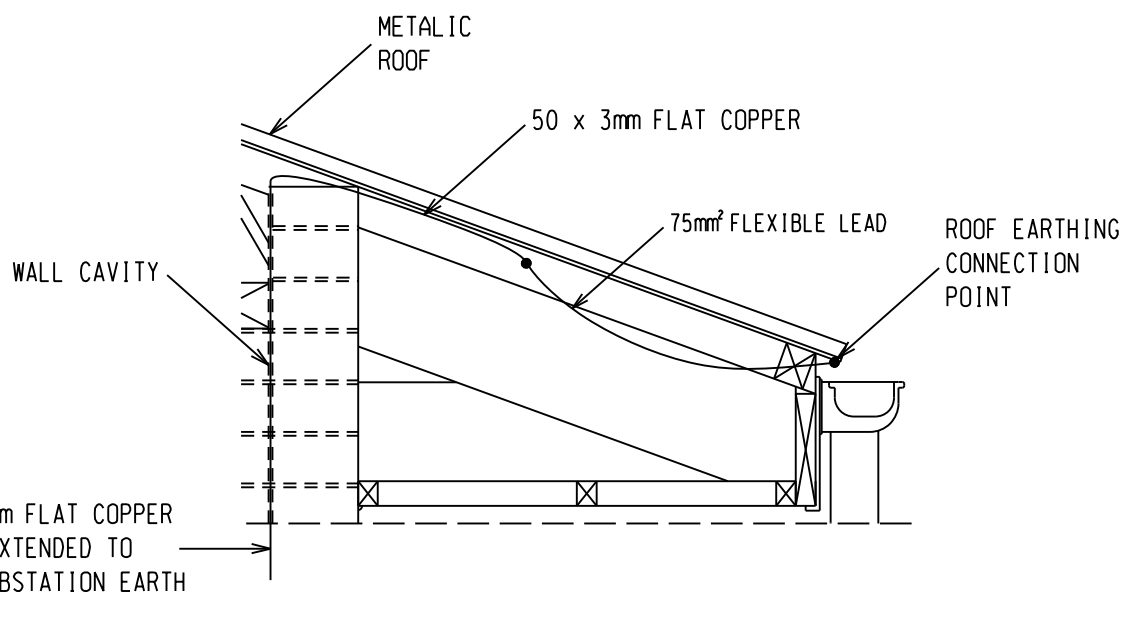
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### ROOF EARTHING CONNECTION DETAIL NTS

#### NOTES:

1. 50 x 3mm FLAT COPPER SHALL RUN VIA THE WALL CAVITY TO THE POINT WHERE THE ROOF WILL BE EARTHED.
2. BOLT FLEXIBLE LEAD TO THE 50 x 3mm WITH A BI-METALIC LUG.
3. BOLT FLEXIBLE LEAD TO ROOF USING STAINLESS STEEL BOLTS, NUTS AND 2 WASHERS ABOVE THE GUTTER AREA.
4. EXTEND THE 50 x 3mm EARTH TAIL AND BRAZE TO THE MAIN EARTH GRID.
5. ROOF TO BE EARTH AT TWO DIAGONALLY OPPOSITE POINTS.
6. ALL ELECTRICAL BOLTED CONNECTION ARE TO BE CLEANED AND FILLED WITH AN ANTI-OXIDIZING ELECTRICAL COMPOUND.
7. WHERE METAL GUTTER ARE USED, THE GUTTER SHOULD BE CONNECTED TO THE ROOF CONNECTION POINT VIA EARTHING FLEXIBLE STRAP.

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REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

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## EARTHING STANDARD

### ROOF EARTHING DETAIL

AUTH: T. MARAIS

DATE: 05/04/2019

CHKD: J.K. RAGHUBIR

DATE: 05/04/2019

DRAWN: BM HLOMENDLINI

DATE: 20/02/2019

D-DT-5240

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NON-METALIC ROOF

ALUMINIUM GUTTER  
M16 BOLT, NUT AND  
2 WASHERS

MAKE A 60 x 60 OPENING  
IN FASCIA TO FIT A  
50 x 50 EARTHTAIL CLAMP  
SEE DRG. 0.54/393 SHT. C6

φ10mm COPPER ROD FIXED TO CLAMP  
SEE DRG. 0.54/393 SHT. C7

φ20mm GALVANISED PIPE  
FIXED TO WALL WITH  
GALV. SADDLES

φ10mm COPPER ROD FROM MAIN EARTHMAT  
TO BE TIED TO EACH INDIVIDUAL GUTTER.

TYPICAL SECTION

NOTES:

1. ALL EARTHING TO BE DONE IN ACCORDANCE TO D-DT-5240.
2. THE EARTHTAIL CLAMP MUST BE FIXED TIGHTLY AGAINST THE GUTTER.
3. THE 50 x 50mm AREA OF THE CLAMP AT THE GUTTER MUST BE SANDED TO EXPOSED METAL.
4. AFTER THE CLAMP IS FITTED, THE AREA AROUND IT MUST BE SEALED WITH AN EXTERIOR UV RESISTANT ACRYLIC SEALER (SIKA SIKAFLEX F1 OR SIMILAR) TO PREVENT THE INCREASE OF WATER.
5. IF GUTTERS ARE NOT CONTINUOUS AND IS DEVIDED, EACH MUST BE EARTHED SEPERATELY AND FIXED TO THE MAIN EARTH GRID.

THIS DRAWING IS THE NEW OFFICIAL REVISION. IT SUPERCEDES ALL OTHER PUBLISHED DRAWINGS.

0	FIRST ISSUE	BHM			15/08/2018	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.



# EARTHING STANDARD

## GUTTER OR EXTERNAL ROOF

### EARTHING DETAIL

AUTH: T. MARAIS

DATE: 05/04/2019

CHKD: J.K. RAGHUBIR

DATE: 05/04/2019

DRAWN: BM HLOMENDLINI

DATE: 20/02/2019

D-DT-5240

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