

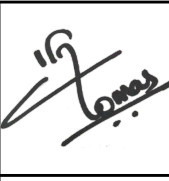
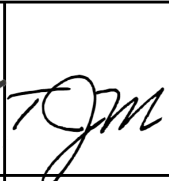



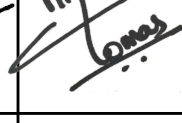

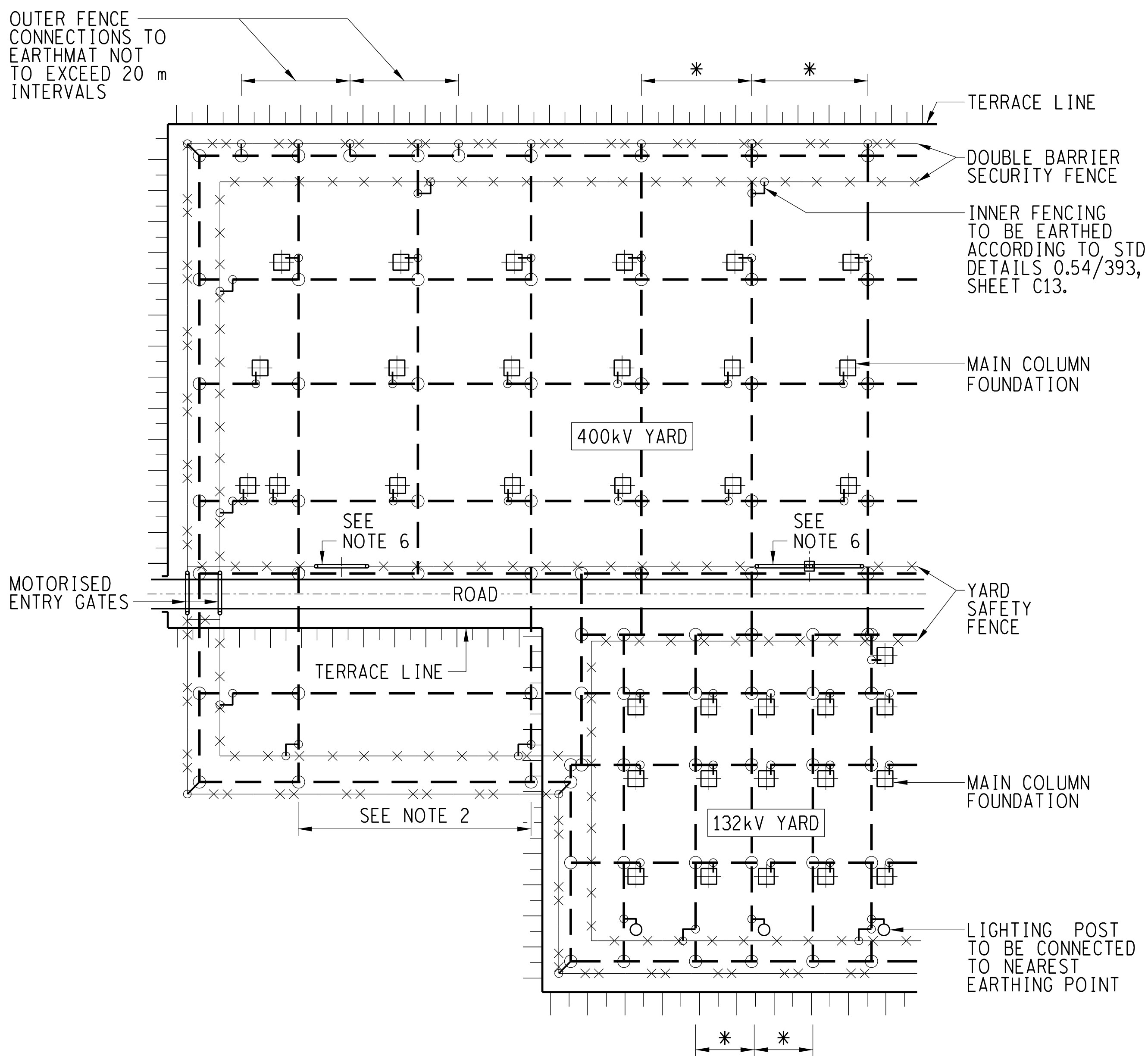


| | | | | | | | | |
|---|---|---|---------------------------------------|----|--------------|------|------------------|------------|
| 1 | | 2 | | 3 | | | 4 | |
| A | SHEET | DESCRIPTIONS | | | | | | REV |
| | 00 | COVER SHEET | | | | | | 27 |
| | 01 | THIS SHEET | | | | | | 1 |
| | 02 | DESCRIPTIONS | | | | | | 1 |
| | 03 | DESCRIPTIONS | | | | | | 1 |
| B | 04 | DESCRIPTIONS | | | | | | 0 |
| | C1 | EARTH MAT AND TAILS | | | | | | 7 |
| | C2 | EARTH MAT AND TAILS | | | | | | 6 |
| | C3 | EARTH MAT AND TAILS | | | | | | 6 |
| | C3A | EARTH MAT AND TAILS/SURFACE LAYER COVERING | | | | | | 4 |
| B | C3B | EARTH MAT AND TAILS | | | | | | 4 |
| | C4 | COPPER CRIMPET | | | | | | 4 |
| | C5 | BRAZED COPPER JOINTS; CRIMPET JOINTS | | | | | | 5 |
| | C5A | EXOTHERMIC JOINTS | | | | | | 0 |
| | C5B | EXOTHERMIC JOINTS | | | | | | 0 |
| C | C6 | EARTHTAIL CLAMP | | | | | | 2 |
| | C6A | EARTHTAIL CLAMPING PLATE | | | | | | 1 |
| | C7 | EARTHTAIL CLAMP (TYPICAL APPLICATIONS) | | | | | | 3 |
| | C8 | SADDLE FOR 2x ϕ 10mm, EARTHING Cu RODS | | | | | | 1 |
| | C9 | BOLTED JOINTS: T-JOINT AND STRAIGHT JOINT | | | | | | 2 |
| C | C10 | EARTH STRAP FIXING - DETAIL 'A' CONTROL ROOM TRENCH STRAP - DETAIL 'B' | | | | | | 2 |
| | C11 | TYPICAL EARTH MAT CONNECTION TO COLUMN AND TAIL FOR EQUIPMENT EATHING | | | | | | 4 |
| | C12 | METHOD OF EARTHING ALUMINIUM OR GALVANISED STEEL CLADDING | | | | | | 1 |
| | C13 | SAFETY FENCE EARTHING: STEEL POST | | | | | | 3 |
| | C14 | SAFETY FENCE EARTHING: CONCRETE POSTS WITH ALUMINIUM WIRE FENCE | | | | | | 3 |
| D | C15 | FENCE EARTHING WOODPOLE WITH GALVANISED WIRE FENCE | | | | | | 1 |
| | C16 | TANKS, BASES, ETC. & NEUTRALS OF ALL EQUIPMENT MOUNTED ON NON-METALLIC SUPPORTS | | | | | | 2 |
| | C17 | PAINTED TANKS, BASES ETC. OF EQUIPMENT MOUNTED ON EARTHED STEELWORK | | | | | | 2 |
| | C18 | GALVANISED TANKS, BASES ETC. OF EQUIPMENT MOUNTED ON EARTHED STEELWORK | | | | | | 2 |
| | C19 | ALL SINGLE CORE CABLE SEALING ENDS | | | | | | 1 |
| E | C20 | SWITCHBOARDS (WITH THERMOPLASTIC INSULATED CABLES) | | | | | | 2 |
| | C21 | SWITCHBOARDS (WITH PAPER INSULATED CABLES) | | | | | | 1 |
| | C22 | ARMOURED MULTICORE CONTROL, TELEPHONE AND POWER CABLES & G.P.O. UNARMOURED TYPE 'Z' CABLE | | | | | | 2 |
| | C23 | EARTHING FOR JUCTION BOX | | | | | | 2 |
| | C24 | ARMOURED TELEPHONE AND SCREENED CONTROL CABLES AT JUNCTION BOX | | | | | | 2 |
| E | C25 | TYPICAL TRANSFORMER AND SA EARTHING | | | | | | 2 |
| | C26 | BOLTED CONNECTION BETWEEN 50x3mm Cu STRAP AND 2 x ϕ 10 Cu RODS | | | | | | 1 |
| F | 1 | | SHEET ADDED FOR TRANSMISSION SECTION. | | JMV | KN | TM | 30/05/2022 |
| | 0 | | FIRST ISSUE. | | JMV | KN | TM | 30/07/2019 |
| | REV | | REVISION DESCRIPTION | | BY | CHKD | AUTH | DATE |
| |  Eskom | | INDEX OF EARTHING STD'S | | 0.54/393 | | | |
| | | | | | SHEET NUMBER | | REVISION | |
| Eskom Holdings SOC Limited REG No. 2002/015527/30 | | | | 01 | | 1 | | |
| 1 | | 2 | | 3 | | | 4 | |
| | | | | | | | SIZE GROOTTE A4L | |

| | | | | | | | | | |
|---|--|--|-------------------------|---|--------------|---|---|---|------------|
| 1 | | 2 | | 3 | | 4 | | | |
| A | SHEET | DESCRIPTION | | | | | REV | | |
| | C27 | TYPICAL LAYOUT OF SUBSTATION SHOWING REQUIRED EARTHING CONNECTIONS | | | | | 1 | | |
| | C28 | EARTHING OF TELEPHONE OR PROCESS CONTROL CABLES | | | | | 1 | | |
| | C29 | EARTHING OF PROCESS CONTROL COMPUTERS | | | | | 1 | | |
| | C30 | EARTHING OF ELECTRIC ENCLOSURES | | | | | 1 | | |
| | C31 | EARTHING OF STEEL STRUCTURES | | | | | 1 | | |
| B | C32 | EARTHMAT RUNNING UNDER EXISTING REVETMENT | | | | | 1 | | |
| | C33 | TYPICAL LAYOUT FOR EARTHING OF BARRIER FENCES WITH STONE VERGE | | | | | 0 | | |
| | C34 | SECURITY LIGHTING POLE EARTHING | | | | | 0 | | |
| | C35 | EARTHING TO TILED ROOF BUILDINGS | | | | | 0 | | |
| | C36 | EARTHING TO CLADDED STORE BUILDING COLUMN | | | | | 0 | | |
| C | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| D | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| E | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| F | | | 1 | MOVED POWER STATION (P1 TO P10) TO SHEET 03 AND TRANSMISSION SECTION (T1 TO T10) TO NEW SHEET 04. | |  |  |  | 30/05/2022 |
| | | | 0 | FIRST ISSUE. | | JMV | KN | TM | 30/07/2019 |
| |  Eskom | | REV | REVISION DESCRIPTION | | BY | CHKD | AUTH | DATE |
| | | | INDEX OF EARTHING STD'S | | 0.54/393 | | | | |
| | | | | | SHEET NUMBER | | REVISION | | |
| Eskom Holdings SOC Limited REG No. 2002/015527/30 | | | | 02 | | 1 | | | |
| 1 | | 2 | | 3 | | 4 | | SIZE GROOTTE | A4L |

| | | | | | | | | |
|---|---|--|--|----------|---|---|---|------------|
| 1 | | 2 | | 3 | | 4 | | |
| A | SHEET | DESCRIPTION | | | | | REV | |
| | P1 | OIL TYPE AUXILIARY TRANSFORMERS IN POWER STATION & DRY TYPE AUXILIARY TRANSFORMERS IN POWER STATION | | | | | 3 | |
| | P2 | MOTORS FED BY XLPE OR THERMOPLASTIC INSULATED CABLES | | | | | 2 | |
| | P3 | MOTORS FED BY MICC, CONDUIT OR PILCSWA CABLES MOUNTED ON EARTHED MATERIAL | | | | | 1 | |
| | P4 | MOTORS FED BY MICC, CONDUIT OR PILCSWA CABLES MOUNTED ON UNEARTHED MATERIAL | | | | | 1 | |
| B | P5 | CONTROL EQUIPMENT & MOTOR STARTERS (CONNECTED BY ARMOURED OR UNARMOURED PVC INSULATED CABLES) | | | | | 2 | |
| | P6 | CONTROL EQUIPMENT AND MOTOR STARTERS (CONNECTED BY MICC, CONDUIT OR PILCSWA CABLES) | | | | | 1 | |
| | P7 | POWER STATION AUXILIARY BAY SIGNAL EARTH TERMINATION BOX | | | | | 1 | |
| | P8 | EARTHING OF SIGNAL DISTRIBUTION FRAMES | | | | | 1 | |
| | P9 | EARTHING OF SMALLER 3 PHASE CONSUMERS WITHOUT NEUTRAL WITH 4 CORE UNARMOURED CABLE | | | | | 1 | |
| C | | | | | | | C | |
| D | | | | | | | D | |
| E | | | | | | | E | |
| F |  | 1 | SHEET UPDATED WITH POWER STATION ONLY. MOVED TRANSMISSION SECTION TO NEW SHEET 04. | |  |  |  | 30/05/2022 |
| | | 0 | FIRST ISSUE. | | JMV | KN | TM | 30/07/2019 |
| | | REV | REVISION DESCRIPTION | | BY | CHKD | AUTH | DATE |
| | | INDEX OF EARTHING STD'S (POWER STATION SECTION ONLY) | | 0.54/393 | | | | |
| | SHEET NUMBER | | | REVISION | | | | |
| | Eskom Holdings SOC Limited REG No. 2002/015527/30 | | | 03 | | 1 | | |
| 1 | | 2 | | 3 | | 4 | | |
| | | | | | | SIZE GROOTTE A4L | | |

EARTH MAT AND TAILS



TYPICAL EARTHMAT APPLICATION FOR NEW SUBSTATIONS

1. * AS A MINIMUM THE INTERVALS BETWEEN EARTHING RUNS TO COINCIDE WITH MAIN COLUMN FOUNDATIONS IN THE SUBSTATION YARDS. eg. 400kV = 24m; 132kV = 12m or 15m.
2. IF THE SECURITY FENCING IS OFF THE TERRACE THEN THE EARTHGRID BEYOND THE SUBSTATION SAFETY FENCE NEEDS ONLY TO BE AT ± 45 M INTERVALS.
3. WHERE THERE ARE TWO OR MORE YARDS IN CLOSE PROXIMITY, THE EARTH GRIDS ARE TO BE INTEGRATED.
4. FOR SECURITY AND SAFETY FENCING APPLICATIONS REFER TO S.L.D.G. 16-3; "SUBSTATION FENCING".
5. FOR EARTHING DETAILS REFER TO THIS STANDARD ie. 0.54/393.
6. ALL GATES AND REMOVABLE PANELS ARE TO BE BONDED WITH AN EARTH CONNECTION IN ACCORDANCE TO 0.54/4963.



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REG No. 2002/015527/30

4 DRG SHEET REPLACED.

REV

REVISION DESCRIPTION

JMV

KN

TM

28/06/2019

BY

CHKD

AUTH

DATE

EARTHING
STANDARDS

0.54/393

SHEET NUMBER

REVISION

C3B

4

4 SIZE
GROOTTE A4L

1

2

3

4

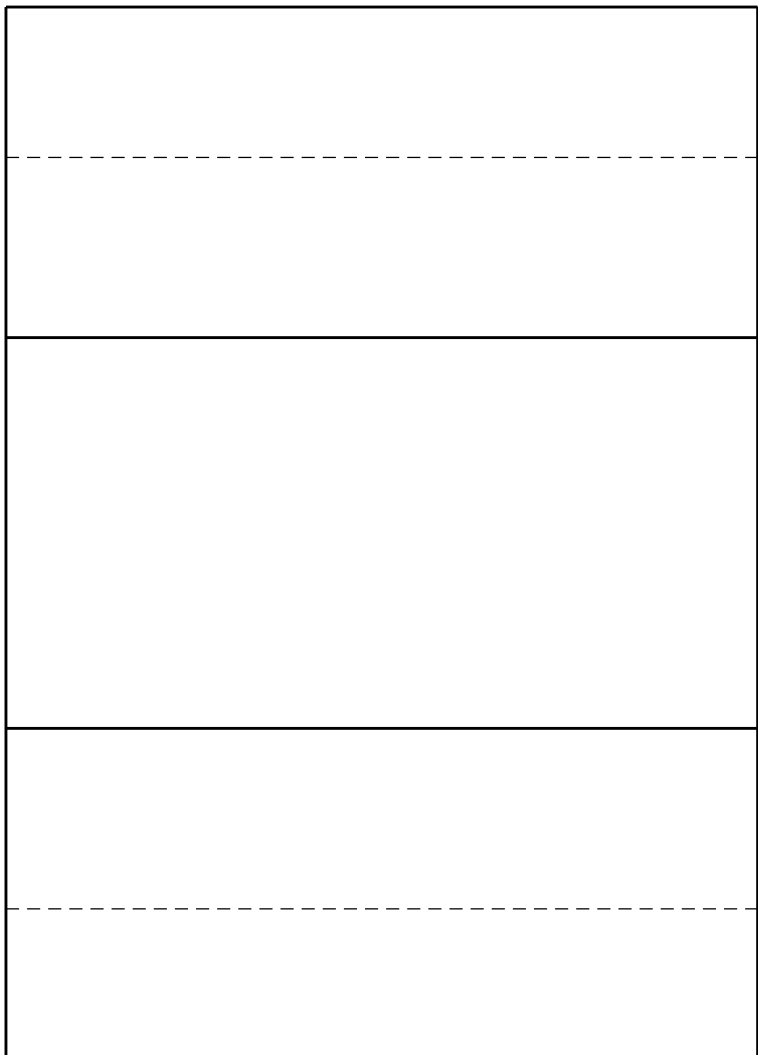
COPPER CRIMPET

A

(FOR CRIMPED JOINTS $\phi 10\text{mm}$ TO $\phi 10\text{mm}$ ANNEALED Cu-OFE (CW099A)
(REFERENCE: EUROPEAN STANDARD 'EN 13601' (2013 OR LATER) WITH
VOLUME RESISTIVITY EQUAL TO OR LOWER THAN $0,0172\Omega\text{mm}^2/\text{m}$

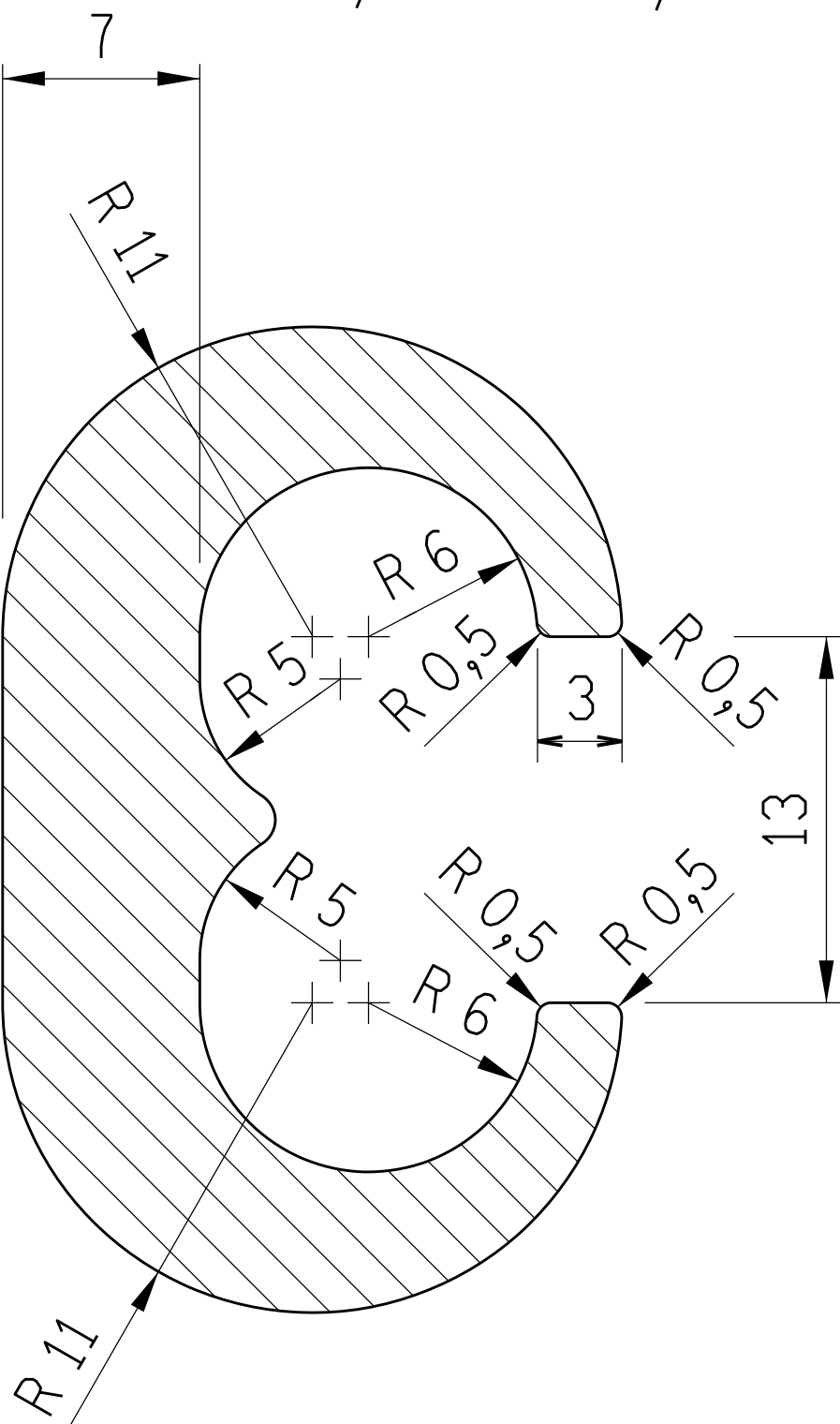
A

B



B

C



C

D

SCALE 2:1

D

E

MATERIAL: ELECTROLYTIC COPPER (ANNEALED)

MASS: 8 kg/100 UNITS.

NOTE: ALL DIMENSIONS $\pm 0,5\text{mm}$

E

F



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REG No. 2002/015527/30

4

DRG SHEET REPLACED.

JMV

KN

TM

28/06/2019

REV

REVISION DESCRIPTION

BY

CHKD

AUTH

DATE

EARTHING
STANDARDS

0.54/393

SHEET NUMBER

REVISION

C4

4

F

1

2

3

4

SIZE
GROOTTE A4L

1

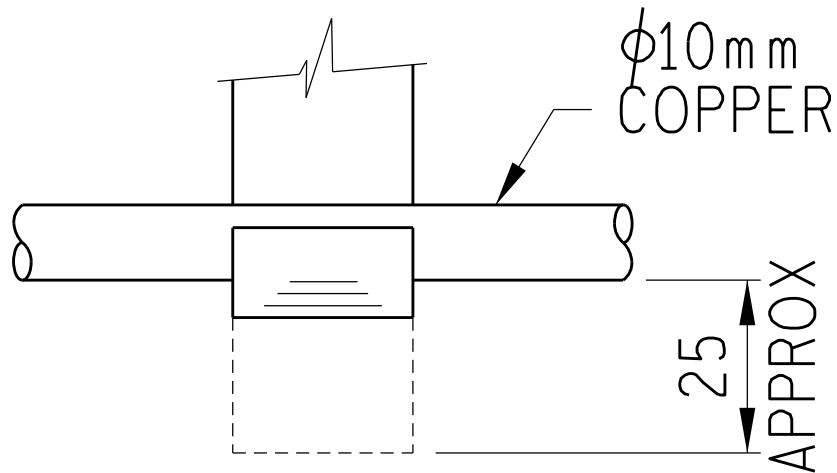
2

3

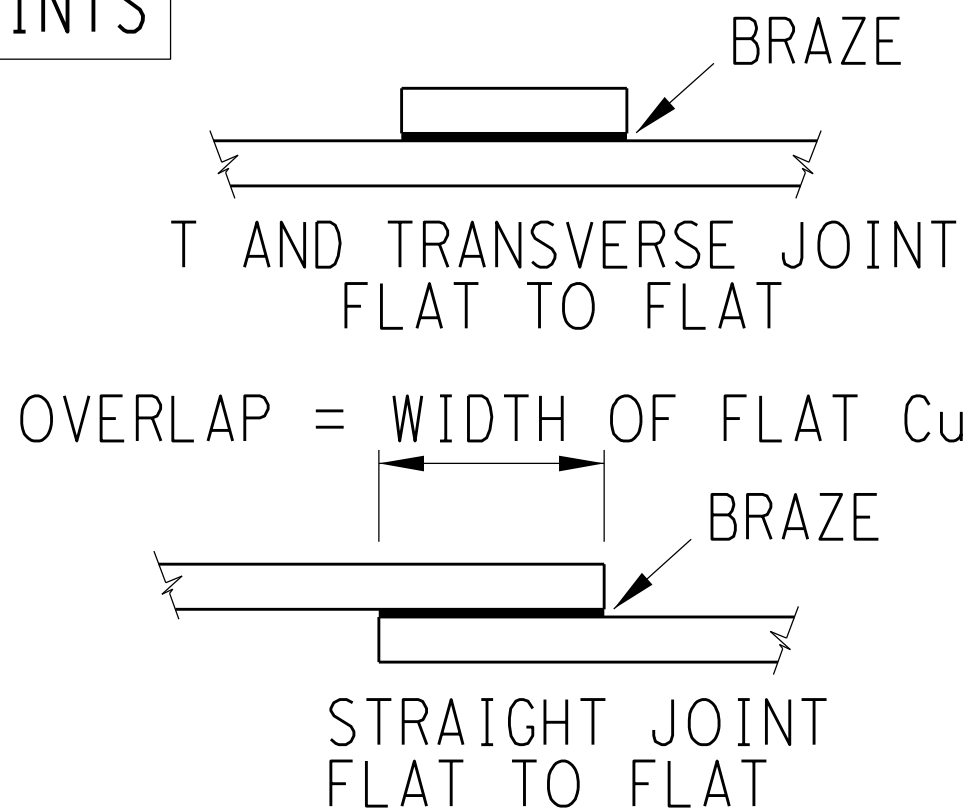
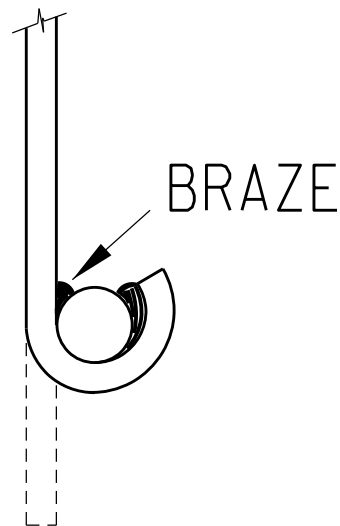
4

BRAZED COPPER JOINTS

A



T-JOINT
ROD TO FLAT



A

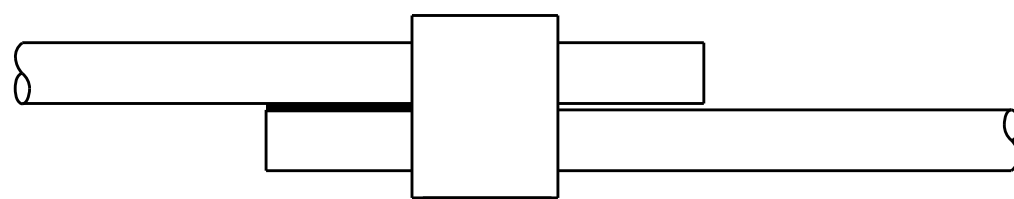
B

1. JOINTS TO BE OXY-ACETYLENE BRAZED, USING $\phi 3\text{mm}$ FILLER METAL EN 1044-CP 105 OR FILLER METAL EN 1044-B-CU92PAG-645/825 (REFERENCE: EUROPEAN STANDARD EN 1044, TABLE 4, ITEM CP 105). NO FLUX IS REQUIRED.
2. EXOTHERMIC WELDING PROCESSES (SEE NOTE 19 ON SHEET C3)

B

CRIMPED JOINTS

C



① STRAIGHT JOINT ROD TO ROD

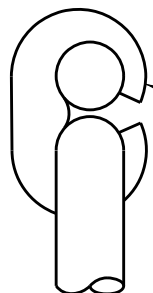
NOTE:

COPPER
CRIMPET
(SEE SHT C1,
NOTE 5)

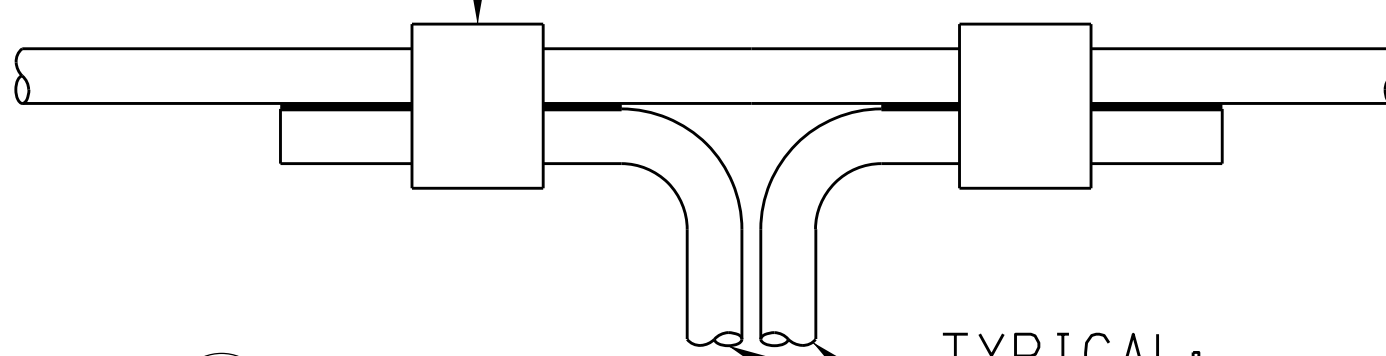
TYPICAL:

MAIN EARTHMAT &
EARTHTAIL EXTENSIONS.

D



COPPER
CRIMPET
(SEE SHT C1,
NOTE 5)

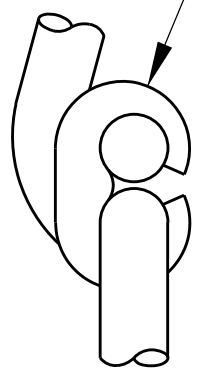


② T-JOINT
ROD TO ROD

TYPICAL:

ONE FOR MAIN EARTHMAT
PERIMETER JOINTS OR
FENCE EARTHTAIL.
TWO FOR COLUMN AND
EQUIPMENT SUPPORTS

E



③ TRANSVERSE JOINT
ROD TO ROD

TYPICAL: MAIN EARTHMAT

C

D

E

F



Eskom Holdings
SOC Limited
REG No. 2002/015527/30

5

DRG SHEET REPLACED. GENERAL REDAWN.

JMV

KN

TM

28/06/2019

REV

REVISION DESCRIPTION

BY

CHKD

AUTH

DATE

EARTHING
STANDARDS

0.54/393

SHEET NUMBER

REVISION

C5

5

F

1

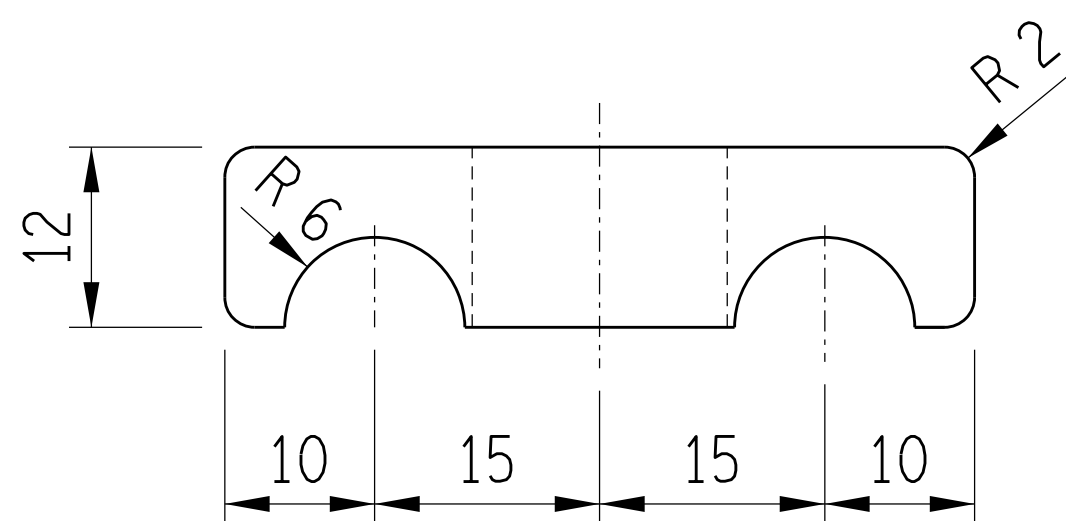
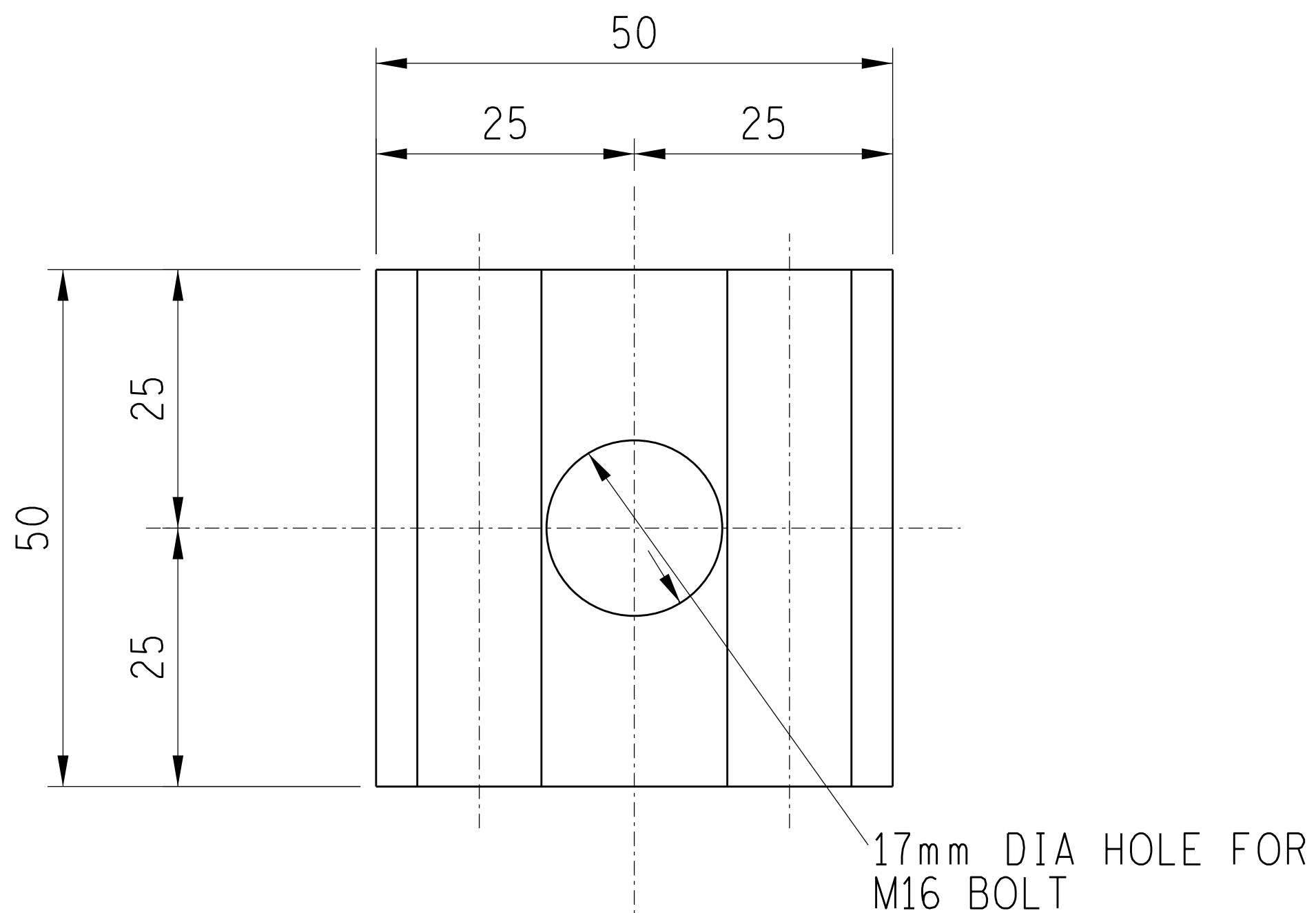
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3

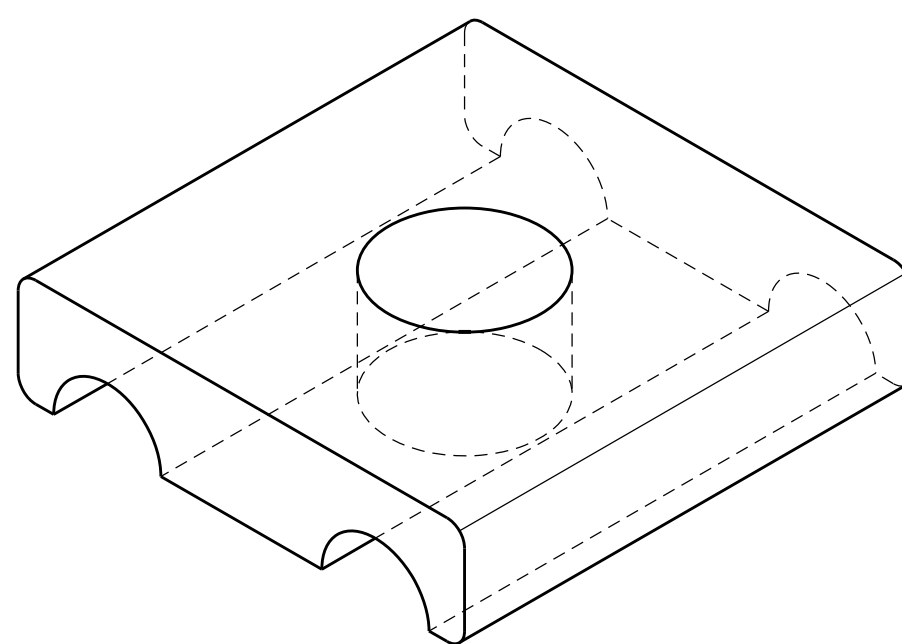
4

SIZE
GROOTTE A4L

EARTHTAIL CLAMP



MATERIAL: ELECTROLYTIC COPPER
MASS: 16kg/100 UNITS
(FOR TYPICAL APPLICATIONS - SEE SHT C7)



END PRODUCT - ISOMETRIC VIEW
(NOT TO SCALE)



Eskom Holdings
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REG No. 2002/015527/30

| | | | | | |
|---|-------------------------------------|-----|----|----|------------|
| 3 | DRG SHEET REPLACED. GENERAL REDAWN. | JMV | KN | TM | 01/08/2019 |
|---|-------------------------------------|-----|----|----|------------|

| | | | | | |
|-----|----------------------|----|------|------|------|
| REV | REVISION DESCRIPTION | BY | CHKD | AUTH | DATE |
|-----|----------------------|----|------|------|------|

EARTHING
STANDARDS

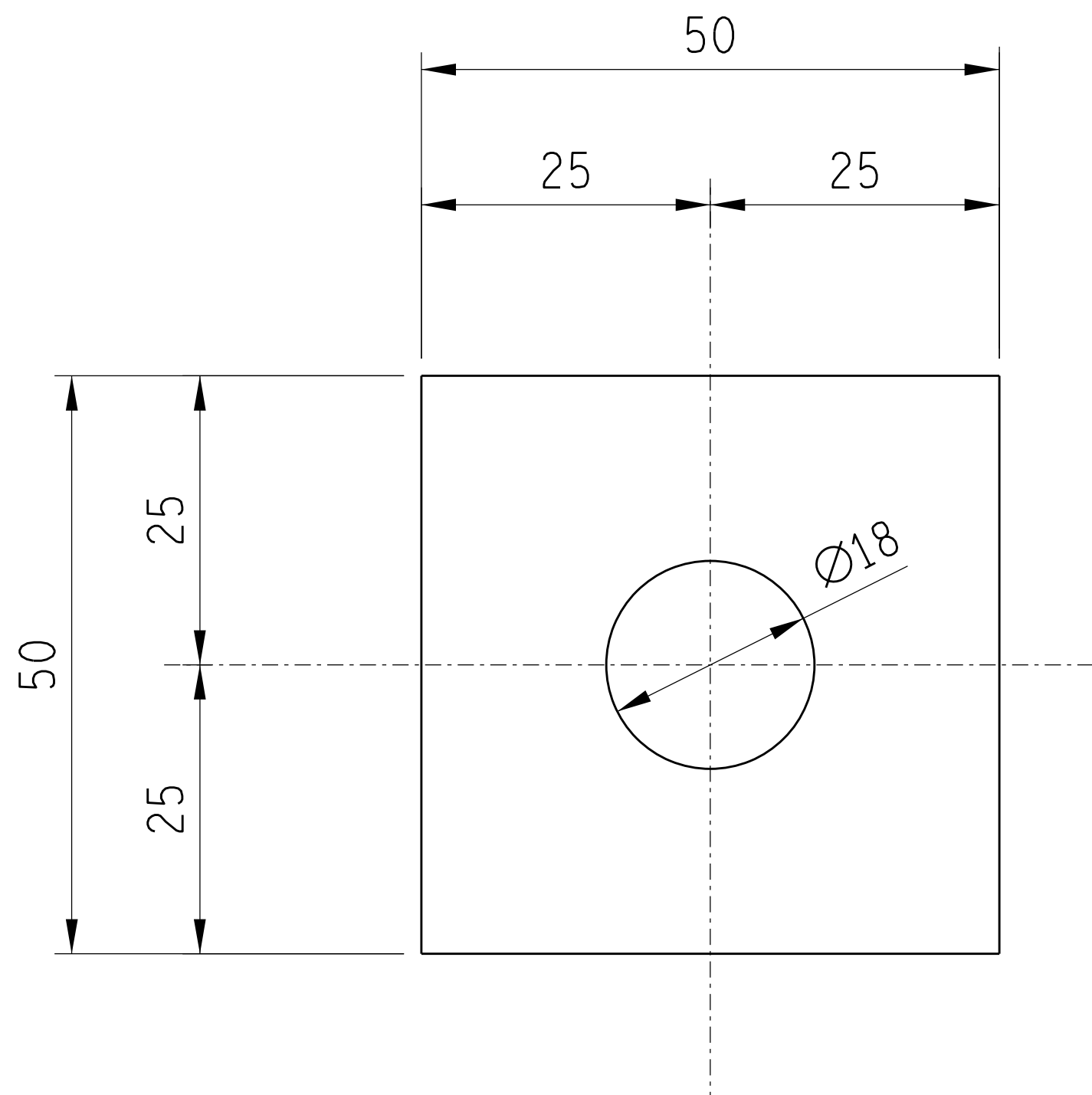
0.54/393

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| SHEET NUMBER | REVISION |
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C6

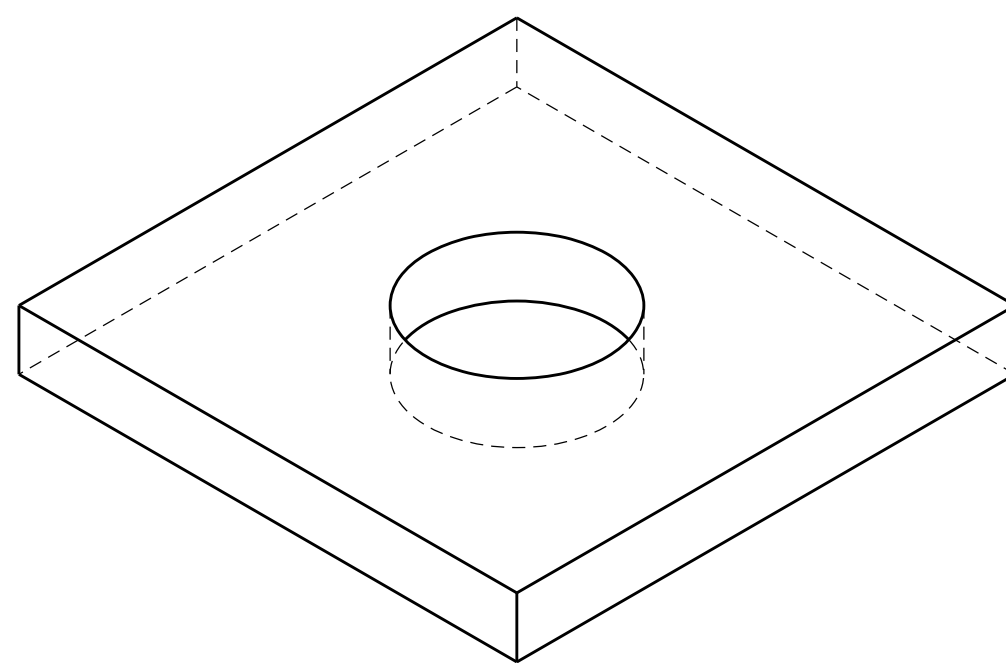
3

EARTHTAIL CLAMPING PLATE



MATERIAL: 6TH M.S. PLATE HOT DIP
GALVANISED TO SABS

APPLICATION: USED WITH EARTHTAIL CLAMP
SHEET C6 TO CLAMP TOGETHER SPARE
EARTHTAILS IN ORDER TO MAINTAIN
EARTHING CONTINUITY.



END PRODUCT – ISOMETRIC VIEW
(NOT TO SCALE)



Eskom Holdings
SOC Limited
REG No. 2002/015527/30

| | | | | | |
|---|-------------------------------------|-----|----|----|------------|
| 1 | DRG SHEET REPLACED. GENERAL REDAWN. | JMV | KN | TM | 28/06/2019 |
|---|-------------------------------------|-----|----|----|------------|

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|-----|----------------------|----|------|------|------|
| REV | REVISION DESCRIPTION | BY | CHKD | AUTH | DATE |
|-----|----------------------|----|------|------|------|

EARTHING
STANDARDS

0.54/393

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| SHEET NUMBER | REVISION |
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| | |
|-----|---|
| C6A | 1 |
|-----|---|

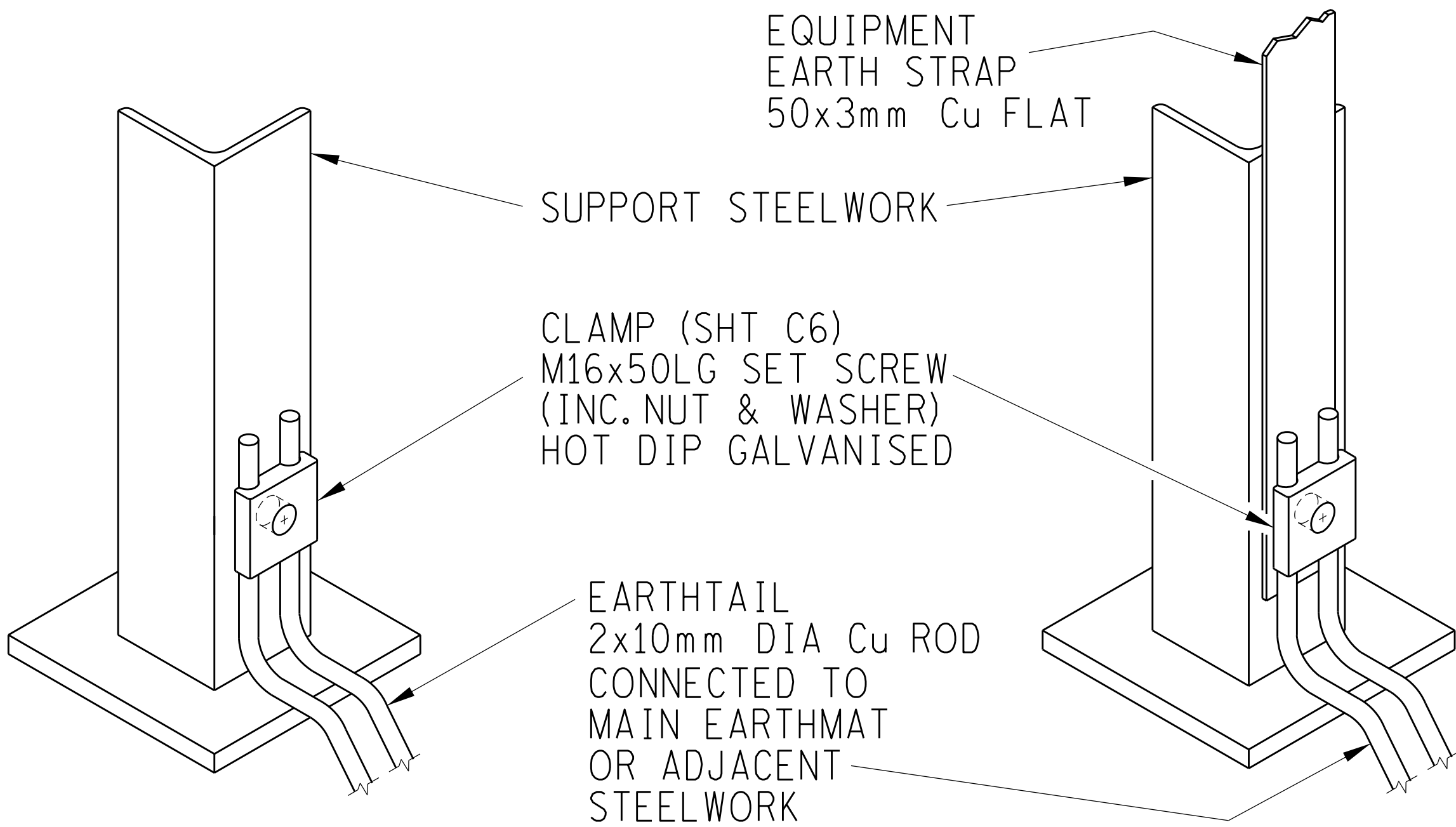
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2

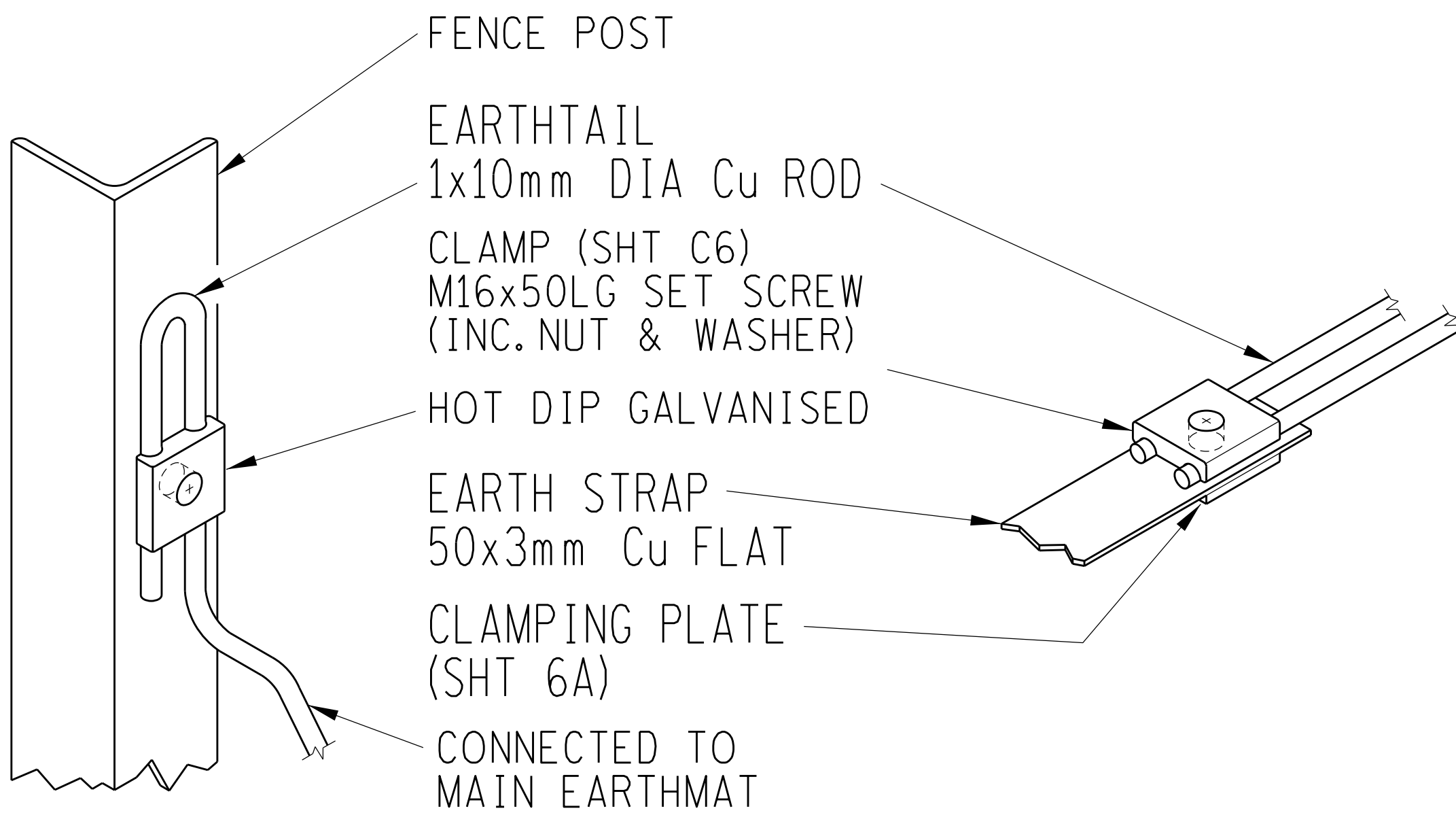
3

4

EARTHTAIL CLAMP (TYPICAL APPLICATIONS)



SUPPORT STEELWORK EARTHING
(SEE ALSO SHEET C31)



STEEL POST FENCE EARTHING



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3

DRG SHEET REPLACED. GENERAL REDAWN.

JMV

KN

TM

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REV

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EARTHING
STANDARDS

0.54/393

SHEET NUMBER

REVISION

C7

3

1

2

3

4

SIZE GROOtte A4L



E

F

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4

A

B

C

D

E

F

A

B

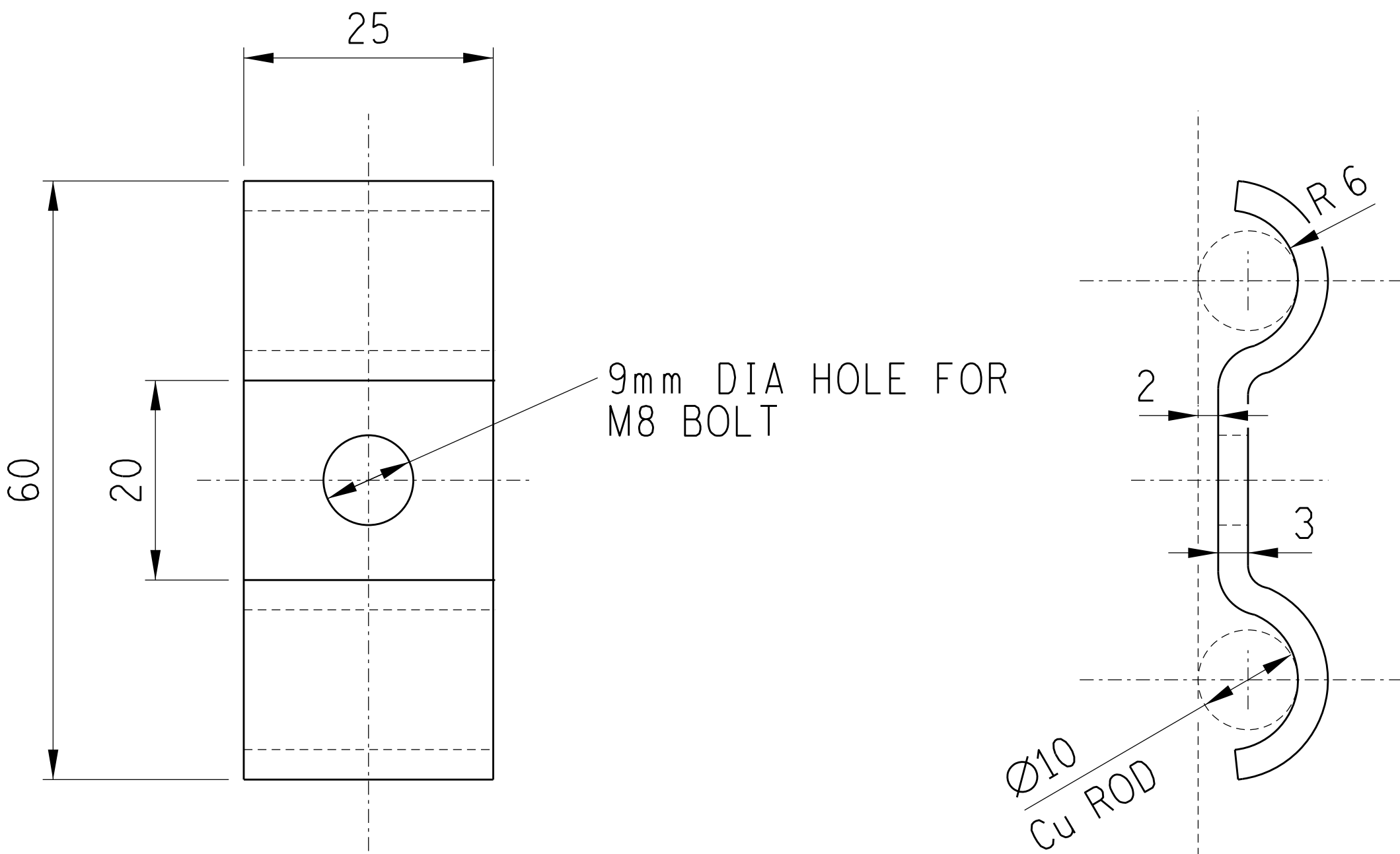
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D

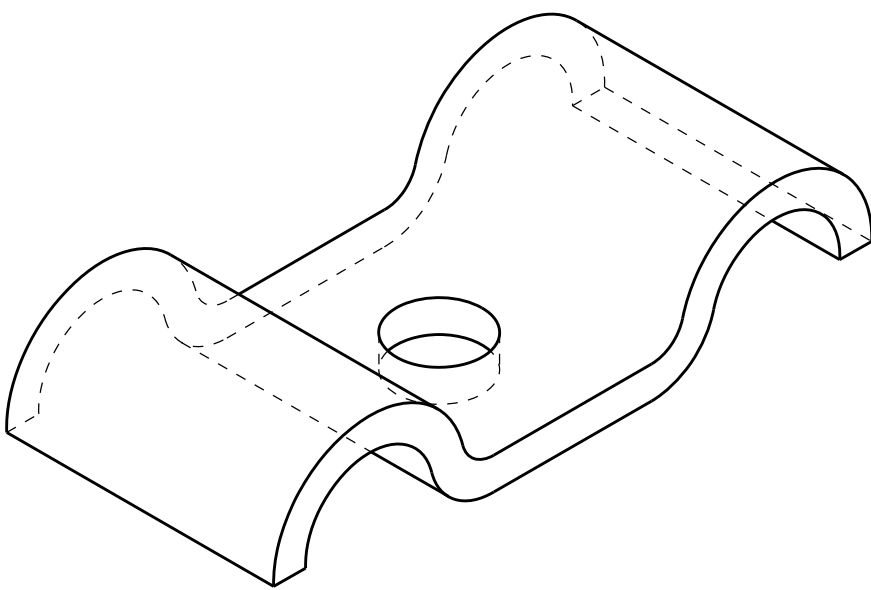
E

F

SADDLE FOR 2x10mm DIA, EARTHING Cu RODS



MATERIAL: HOT DIP GALVANISED STEEL
SCALE 1:1



END PRODUCT – ISOMETRIC VIEW
(NOT TO SCALE)



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1

DRG SHEET REPLACED. GENERAL REDAWN.

JMV

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TM

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REV

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DATE

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STANDARDS

0.54/393

SHEET NUMBER

REVISION

C8

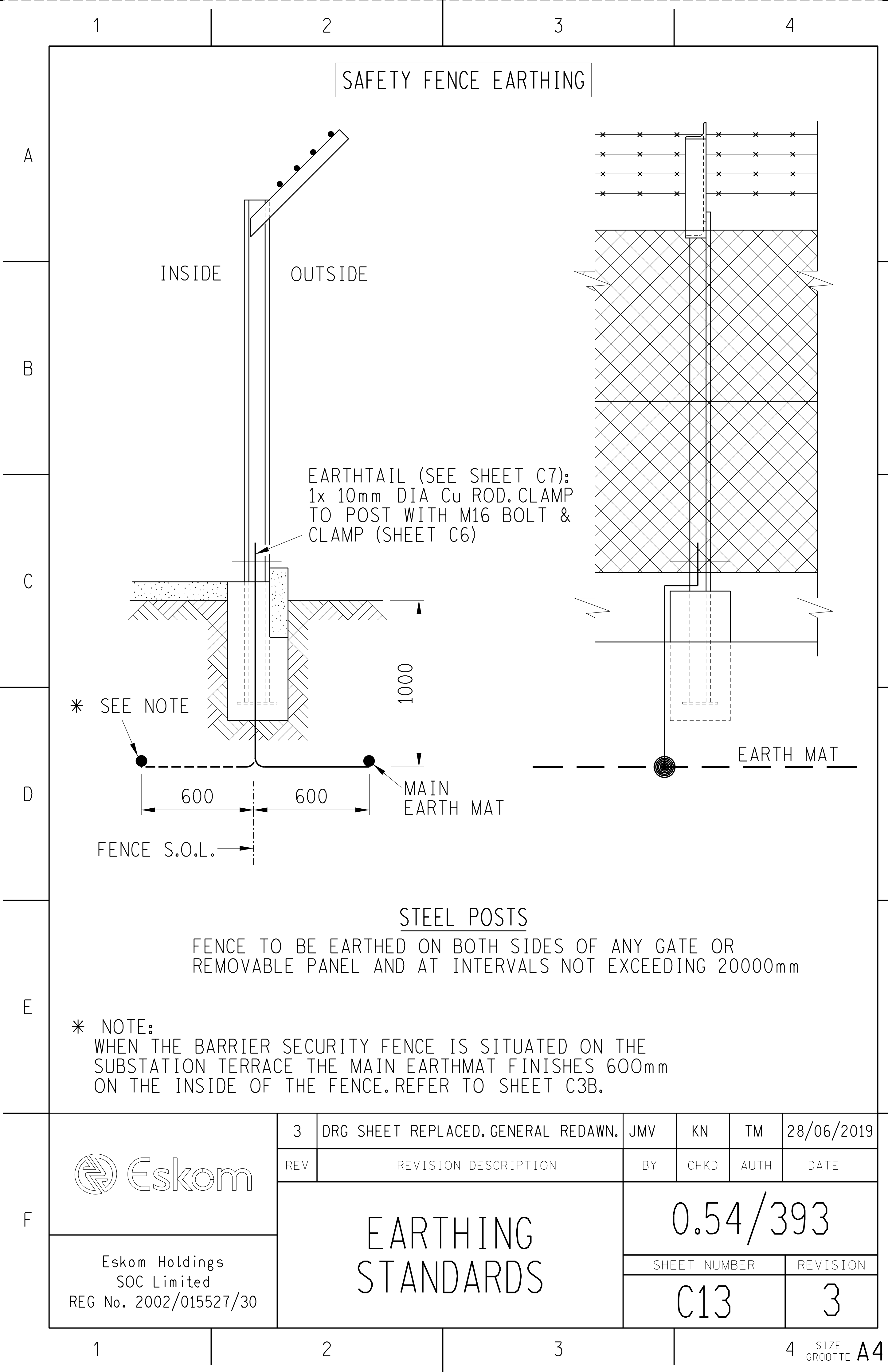
1

1

2

3

4 SIZE GROOTTE A4L



4



—

F

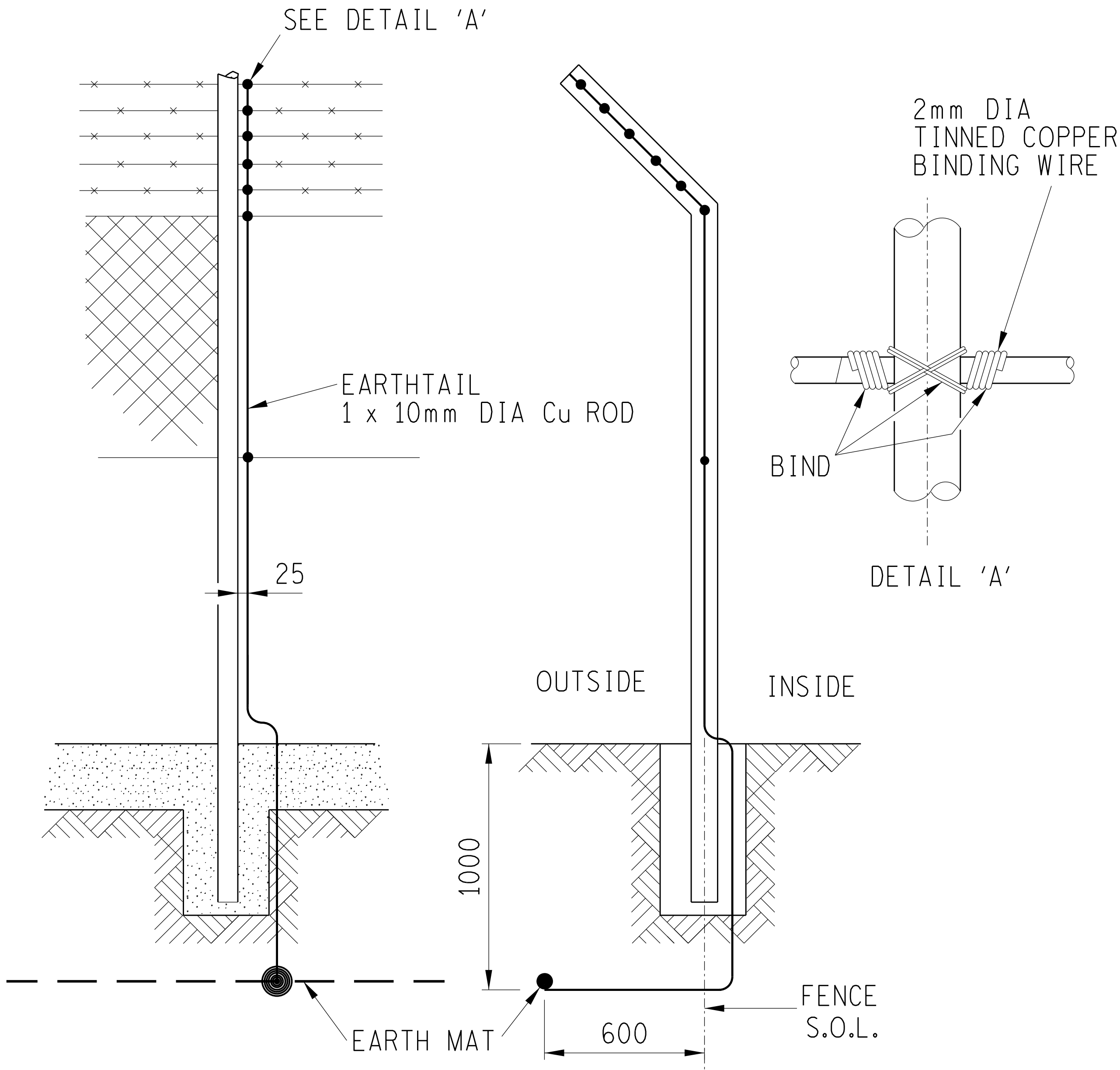
1

2

3

4

FENCE EARTHING WOODPOLE WITH GALVANISED WIRE FENCE



FENCE TO BE EARTHED ON BOTH SIDES OF ANY GATE OR REMOVABLE PANEL AND AT INTERVALS NOT EXCEEDING 20000mm



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1

DRG SHEET REPLACED. GENERAL REDAWN.

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28/06/2019

REV

REVISION DESCRIPTION

BY

CHKD

AUTH

DATE

EARTHING
STANDARDS

0.54/393

SHEET NUMBER

REVISION

C15

1

1

2

3

4

SIZE GROOTTE A4L

4

A

B

C

D

F

EARTH MAT

NOTE:
SUPPORT STEEL EARTHING.
 NUMBER OF EARTHING CONNECTIONS
 TO EARTH MAT AS PER APPLICABLE SUBSTATION BAY EARTHING SHEETS.



EARTHING STANDARDS

0.54/393

SHEET NUMBER

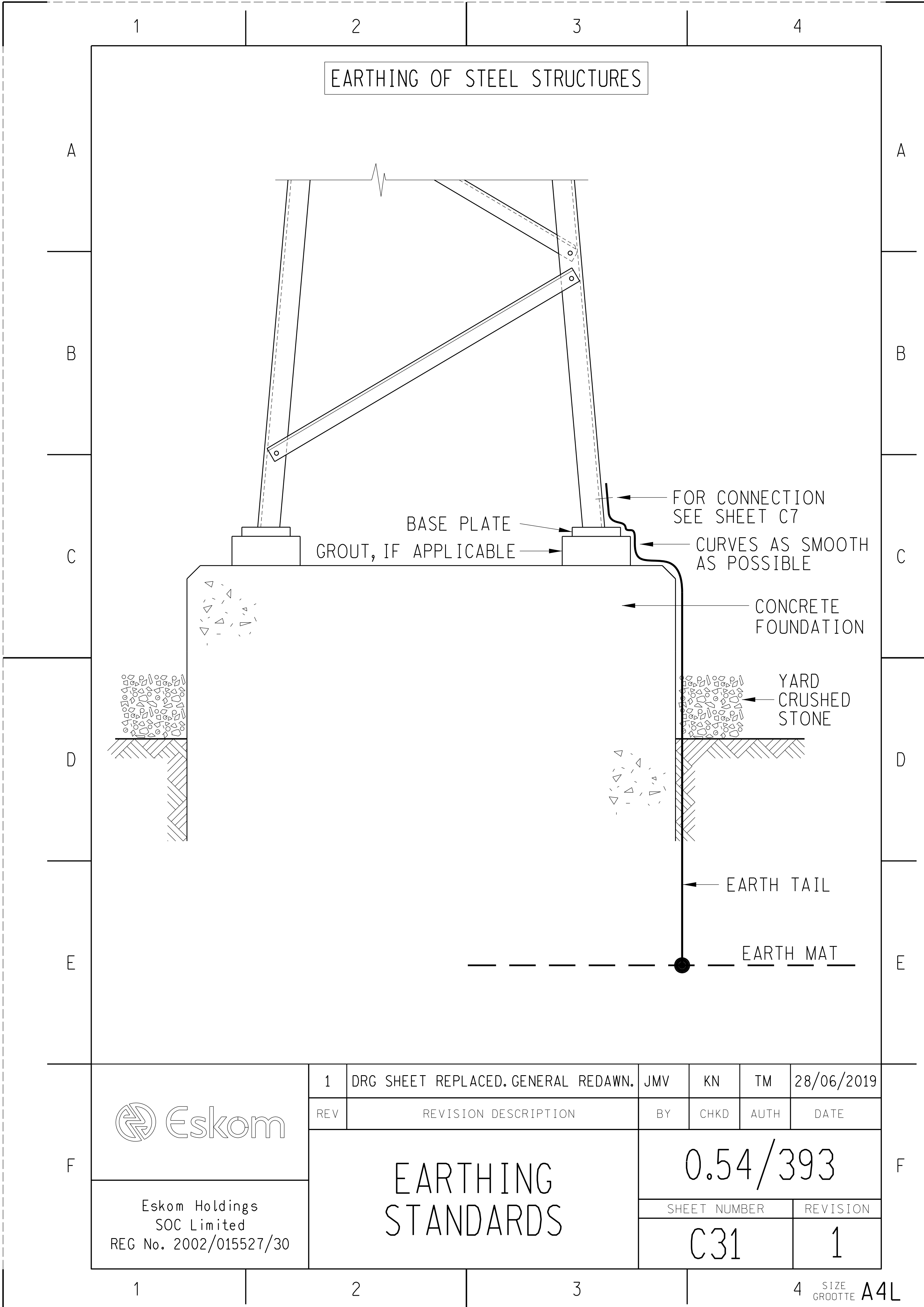
REVISION

C18

2

4

SIZE A4L
GROOTTE A4L



| | | | | | | |
|--|-----------------------|-------------------------------------|--------------|------|----------|------------|
|  Eskom Holdings SOC Limited REG No. 2002/015527/30 | 1 | DRG SHEET REPLACED. GENERAL REDAWN. | JMV | KN | TM | 28/06/2019 |
| | REV | REVISION DESCRIPTION | BY | CHKD | AUTH | DATE |
| | EARTHING STANDARDS | | 0.54/393 | | | |
| | | | SHEET NUMBER | | REVISION | |
| | | | C31 | | 1 | |