

NOTES:



1. THE EARTH RODS ARE TO BE INSTALLED AND CONNECTED AS SHOWN IN THE TYPICAL EARTHING LAYOUT, WITH THE COMMON EARTHING TAIL BEING BROUGHT UP AGAINST THE SUBSTATION WALL IN THE VICINITY OF THE FUTURE NEUTRAL/EARTH BAR POSITION (REFER TO NOTE 6 FOR DETAILS), PRIOR TO POURING OF THE SUBSTATION FLOOR. ALTERNATIVELY, BARE COPPER CABLE MAY BE USED INSTEAD OF EARTH ELECTRODE.
2. ALL EARTHING CABLES TO BE OF A MINIMUM 70sq mm COPPER CABLE.
3. CONNECTION FOR EARTH ROD AND EARTHING CABLE FOR EARTH RODS SHOULD BE AS DETAILED ON DRAWING No. S01-01-05-08 IN THE OVERHEAD LINE MANUAL.
4. WHERE AN EARTHING DESIGN CANNOT BE OBTAINED, A MINIMUM OF FOUR (4) EARTH RODS ARE TO BE INSTALLED IN A SINGLE TRANSFORMER SUBSTATION AND SIX (6) RODS IN A TWO OR THREE TRANSFORMER SUBSTATION AS FOLLOWS:
 - USE AUGER WITH MINIMUM 50mm DIAMETER TO DRILL BORE HOLES TO A DEPTH OF 3-5m; THE DEEPER THE BETTER GENERALLY.
 - RODS TO BE SPACED WELL APART (PREFERRABLY NEAR THE CORNERS FOR GREATER SPACING BUT IN NO CASE CLOSER THAN 3m.
 - CONNECT EACH ROD WITH A 70sq.mm COPPER INSULATED CONDUCTOR BY A PROFILE '6' COMPRESSION CONNECTOR.
 - BACKFILL EACH HOLE WITH A WATERED MIXTURE OF EXISTING SOIL AND ONE BAG OF EARTHING COMPOUND.

NOTE:

 - (i) INSULATION TO BE REMOVED FROM THE CABLE WHICH IS IN THE BORE HOLE, TO INCREASE SURFACE CONDUCTIVITY TO GROUND.
 - (ii) ALL BARE CONNECTIONS, SUCH AS COMPRESSION CONNECTORS NEED NOT BE INSULATED, HOWEVER CARE MUST BE TAKEN TO ENSURE THAT NO BARE CONNECTION TOUCHES THE CONSUMERS' STEEL WORK.
5. THE COMBINED EARTHING SYSTEM SHALL HAVE A RESISTANCE TO EARTH NOT GREATER THAN 1 OHM. WHEN ANY ONE CONNECTION IS TEMPORARILY REMOVED FOR TEST OR MAINTENANCE PURPOSES, THE RESISTANCE OF THE REMAINING EARTH CONNECTIONS DOES NOT EXCEED 30 OHMS.
6. A COMMON NEUTRAL/EARTH BAR IS TO BE INSTALLED WITHIN THE SUBSTATION. THE BUSBAR SHALL BE 80X6.3mm H.D.H.C. TINNED COPPER, MOUNTED ON LV INSULATORS APPROXIMATELY 300mm ABOVE THE SUBSTATION FLOOR AND SHOULD EXTEND FOR THE FULL DISTANCE BETWEEN THE LOW VOLTAGE CIRCUIT BREAKER POSITIONS, AND IN NO CASE BE LESS THAN 2m IN LENGTH. THE BUSBAR MUST BE MOUNTED ON BOBBIN STYLE STANDOFF INSULATORS. NUMBER OF HOLES TO SUIT INSTALLATION AND 8 SPARE.

7. THE TRANSFORMER NEUTRAL SIZE SHALL BE THE SAME SIZE AS THE ACTIVE CONDUCTORS.
8. THE FOLLOWING IS A GUIDE FOR THE DISCONNECTION OF COMPONENTS WHEN WORKING ON AN EARTHING INSTALLATION.

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| L.V. TRANSFORMER NEUTRAL TRANSFORMER EARTH LV SURGE DIVERTER EARTH | } | PERMITTED ONLY WHEN THE ASSOCIATED TRANSFORMER IS TAKEN OUT OF SERVICE |
| CABLE TRAY EARTH | | NO RESTRICTION, EXCEPT TO KEEP TIME OF DISCONNECTION TO MINIMUM |
| LV NETWORK DISTRIBUTOR NEUTRAL LV NETWORK DISTRIBUTOR SHEATH | } | PERMITTED ONLY WHEN THE LV NETWORK DISTRIBUTOR IS TAKEN OUT OF SERVICE. |
| CONSUMERS' NEUTRAL | | PERMITTED ONLY WHEN CUSTOMERS SERVICE IS TAKEN OUT OF SERVICE. |
| C.M.E.N. | | PERMITTED WHEN EARTH ELECTRODE SYSTEM IS IN SERVICE |
| EARTH ELECTRODES | | PERMITTED WHEN C.M.E.N. SYSTEM IS IN SERVICE |
| H.V. SWITCHGEAR EARTH OR PIT EARTH BAR | | PERMITTED ONLY WHEN ALL HV FEEDERS TAKEN OUT OF SERVICE |
| H.V. CABLE SHEATHS | | PERMITTED ONLY WHEN THE ASSOCIATED HV FEEDER IS TAKEN OUT OF SERVICE |
9. SUBSTATION METALWORK MUST ONLY BE CONNECTED TO SUBSTATION EARTH BAR WHEN SUBSTATION METALWORK IS ELECTRICALLY SEPARATE FROM ALL OTHER BUILDING METALWORK AND EARTHED METALWORK CONNECTIONS.
10. A SEPARATE EARTH BAR SHALL BE WITHIN THE HV PIT. THE BUSBAR SHALL BE A MINIMUM OF 50x3 H.D.H.C TINNED COPPER MOUNTED ON BOBBIN INSULATORS AT MAXIMUM INTERVALS APPROX 300mm FROM THE TOP OF THE HV PIT, THE EARTH BAR SHALL BE MOUNTED AT EITHER END OF THE HV PIT AND AVOID AREAS UNDER THE SWITCH. THIS BUSBAR SHALL BE CONNECTED TO THE COMBINED EARTH/NEUTRAL BAR BY 1X70sqmm COPPER YELLOW/GREEN INSULATED CABLE AND HAS A MINIMUM OF 2 SPARE HOLES.
11. ALL CABLES ATTACHING TO THE EARTH/NEUTRAL BAR SHALL BE LABELED WITH CRITCHLEY K TYPE LABELED AS LISTED IN S02-01-08-25.

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| | | | | | |  NORTHERN TERRITORY | DES I. PURVES | POWER STANDARD DRAWING | | |
| | | | | | | | DRN G.R./A.D. | INDOOR SUBSTATION EARTHING LAYOUT SHEET 2 OF 2 | | |
| | | | | | | | CKD S. LEACH | | | |
| | | | | | | | APPD F. ROBSON | | | |
| | | | | | | | | SCALE AS SHOWN | A3 | DRAWING NUMBER |
| | | | | | | ISSUED MARCH '98 | | | | |
| | | | | | | ALL DIM. IN mm | | | |  |
| AMENDMENTS | | | | | | | DRAFTING STANDARD TO A.S.1100 | CAD PRODUCT - DO NOT AMEND MANUALLY | | |

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| 5 | SUPERSEDED TO S02-02-06-47. UPDATED NOTES 1 & 4. | A.N. | OCT '21 | A.N. | B.V. |
| 4 | CORRECTED SPELLING NOTES 1,9&11 | H.E. | JAN '21 | H.E. | B.C. |
| 3 | TITLEBLOCK & DRAWING NUMBERS FORMATTED | K.T. | FEB '19 | C.C. | C.C. |
| 2 | NOTE 10 AMENDED | P.H. | APR '18 | I.B. | B.C. |
| 1 | NOTE 10, 11 ADDED | A.T. | JUN '14 | A.T. | B.C. |