



**EARTHING TERMINATION ARRANGEMENT**

**EARTHING REQUIREMENT**

- FOR SUBSTATION EARTH, WITH LINKS 1 AND 2 OPEN, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 30 OHMS.
- FOR CMEN EARTH, WITH LINKS 1 AND 2 CLOSED, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 1 OHM.
- IF ANY OF THE ABOVE VALUES CANNOT BE ACHIEVED, REFER TO THE PROJECT MANAGER.
- 1 SPARE 10mm THREAD BOLT AND NUT FOR OPERATOR EARTHS ON THE HV AND LV EARTH BARS.
- WHERE ACCESS IS LIMITED, EARTHING STAKES IN THE EASEMENT CAN BE RELOCATED TO THE CABLE TRENCH TO ENSURE THE SUBSTATION EARTH RESISTANCE IS LESS THAN 30 OHMS.
- MEN TEE OFF SHALL BE CONNECTED VIA 2 x "C" COMPRESSION CONNECTOR 300mm APART OR CATWELD

**NOTES:**

- THIS EARTHING ARRANGEMENT IS FOR BROWN FIELD SITES ONLY, WHERE THERE IS NO OPTION TO OBTAIN THE NORMAL 4000x3500 EASEMENT.
- EARTHING FOR A PACKAGE SUBSTATION CONSISTS OF FOUR EARTH ELECTRODES IN THE EASEMENT AND THREE EARTH ELECTRODES IN THE CABLE ENTRY TRENCH.
- IN THE EASEMENT: FOUR BORE HOLES TO BE DRILLED AT CORNERS. FOR EACH HOLE:
  - AUGER DIAMETER TO BE USED SHOULD NOT BE GREATER THAN 150mm.
  - BORE DEPTH IS 3m.
  - EARTH ELECTRODE SHALL BE MADE FROM EITHER BARE 70 SQMM COPPER CONDUCTOR OR 70SQMM BARE COPPER CONDUCTOR WITH AN EARTH STAKE ATTACHED VIA A PROFILE "6" COMPRESSION CONNECTOR BEFORE LOWERING THE STAKE INTO THE BORE HOLE. ATTACH THE 70SQMM COPPER CONDUCTOR TO THE EARTH GRID AS SHOWN IN DETAIL 1.
  - BACKFILL BORE HOLE FIRST WITH WATERED SLURRY MIXTURE OF ONE BAG OF EARTHING COMPOUND AND SOIL AT 1:1 RATIO, THEN TOP UP WITH EXISTING SOIL.
- THREE ADDITIONAL EARTH ELECTRODES ARE TO BE INSTALLED AT THE BOTTOM OF THE CABLE ENTRY TRENCH WITH A DISTANCE OF 6M BETWEEN ELECTRODES AND TO A DEPTH OF 3M. A HAMMER CAN BE USED TO DRIVE CONNECTED EARTH RODS INTO THE GROUND, OR ALTERNATIVELY THE EARTH ELECTRODES CAN BE AS PER NOTE 2. DO NOT LET ANY OTHER EARTHING SYSTEM MAKE CONTACT WITH THE SUBSTATION EARTH.
- EQUIPOTENTIAL EARTH MESH OF 400mm WIDTH ON EITHER SIDE SHALL BE CUT IN HALF TO REDUCE THE WIDTH OF THE OVERALL FOUNDATION, MESH SHALL BE LAID ACROSS USING CONCRETE MESH CHAIRS AND CONNECTED TO FOUR EARTH ELECTRODES IN THE EASEMENT AS SHOWN BEFORE FORMING THE CONCRETE APRON FROM THE EASEMENT BOUNDARY TO THE SUBSTATION PAD FOUNDATION.
- FOR MARK 2 SUBSTATION FOUNDATION DETAILS REFER TO DRG NO. S02-2-6-31.
- FOR MARK 3 SUBSTATION FOUNDATION DETAILS REFER TO DRG NO. S02-2-6-37.
- M.E.N. EARTH (FROM DISTRIBUTION SYSTEM) MUST NOT BE BROUGHT INTO ELECTRICAL CONTACT WITH FOUNDATION SO THAT TESTING CAN BE CARRIED OUT. M.E.N. SHALL BE INSULATED WHERE PASSING THROUGH CONCRETE FOUNDATIONS.
- TRAFFIC BOLLARDS SHALL BE CONNECTED TO PERIMETER EARTHING CONDUCTOR BY 70sqmm COPPER CONDUCTOR WHICH WILL BE SET INSIDE THE POST AND LUGGED OFF ONTO A BARRIER BOLT.
- BOND THE SUBSTATION FOUNDATION TO THE SUBSTATION EARTH RING VIA 70sqmm BARE COPPER CABLE USING THE M12 FURRELLS EMBEDDED IN THE FOUNDATION.

TAG No	QTY	DESCRIPTION	STOCK CODE	DRG REF
7	4	EQUIPOTENTIAL EARTHING MESH	288415	-
6	4	EARTHING COMPOUND (BAG)	10876	-
5	7	COMPRESSION CONNECTOR, "6" PROFILE	257394	S01-1-5-08
4	17	COMPRESSION CONNECTOR, "C" PROFILE	255786	S01-1-5-01
3	7	EARTH ROD - 14mm DIA	414060	S01-1-1-23
2	AS REQ	70sqmm INSULATED COPPER CONDUCTOR Y/Gr	401059	S02-1-1-23
1	AS REQ	70sqmm BARE COPPER CONDUCTOR	9803	S01-1-5-05

**MATERIAL SCHEDULE**

DRG NO	DESCRIPTION	NO	DESCRIPTION	DRN	DATE	CKD	APPD
x	x	2	NOTE 6 EARTH DETAIL ADDED	C.C.	NOV'18	B.V.	B.V.
		1	NOTE 7, FOR MARK 3 ADDED	CWM	AUG'17	B.V.	B.C.
		0	ISSUED FOR CONSTRUCTION	K.T.	JUN'16	I.B.	B.C.

**ASSOCIATED DRAWINGS**      **AMENDMENTS**

**PowerWater**  
NORTHERN TERRITORY

**DES** A TAYLOR

**DRN** C COPPINS

**CKD** B CHEUNG

**APPD** B CHEUNG

**SCALE** N.T.S.

**ISSUED** AUGUST 2011

**ALL DIM. IN mm**

**DRAFTING STANDARD TO A.S.1100**

**POWER STANDARD DRAWING**

**EARTHING PACKAGE SUBSTATION MK2 & MK3 CONSTRUCTION DETAILS ON 3500x3500 EASEMENT - BROWN FIELD USE ONLY**

**A3**      **DRAWING NUMBER** S02-2-5-14

**CAD PRODUCT - DO NOT AMEND MANUALLY**