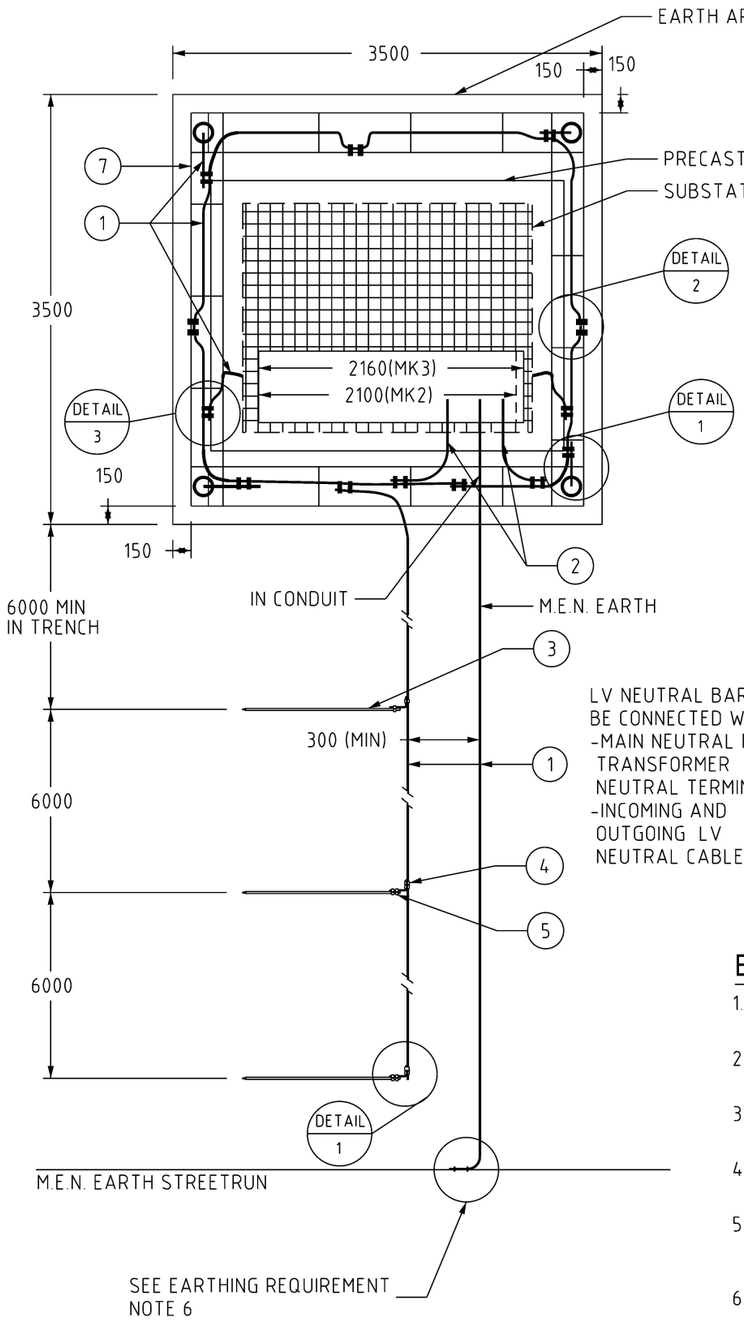

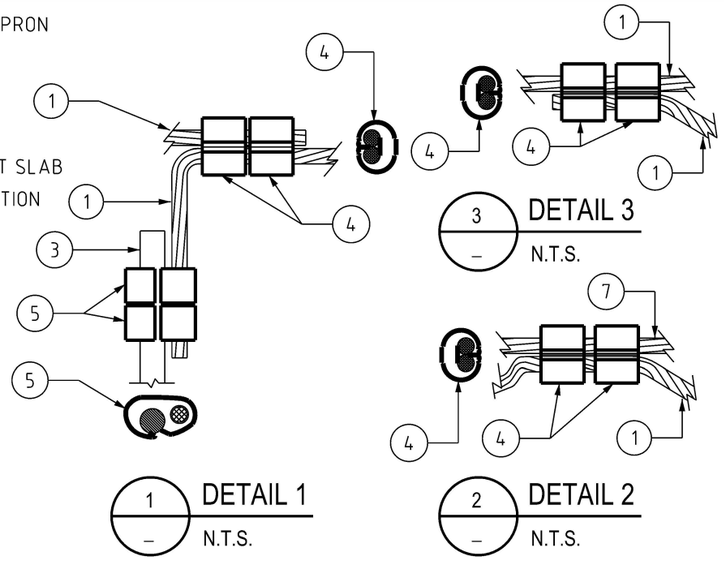

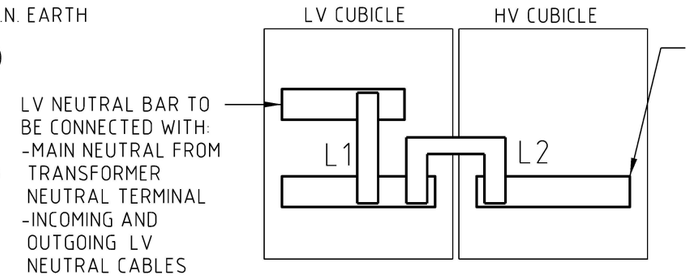

EARTHING TERMINATION ARRANGEMENT

EARTHING REQUIREMENT

1. FOR SUBSTATION EARTH, WITH LINKS 1 AND 2 OPEN, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 30 OHMS.
2. FOR CMEN EARTH, WITH LINKS 1 AND 2 CLOSED, THE RECORDED EARTH RESISTANCE VALUE SHOULD NOT BE GREATER THAN 1 OHM.
3. IF ANY OF THE ABOVE VALUES CANNOT BE ACHIEVED, REFER TO THE PROJECT MANAGER.
4. 1 SPARE 10mm THREAD BOLT AND NUT FOR OPERATOR EARTHS ON THE HV AND LV EARTH BARS.
5. WHERE ACCESS IS LIMITED, EARTHING STAKES IN THE EASEMENT CAN BE RELOCTED TO THE CABLE TRENCH TO ENSURE THE SUBSTATION EARTH RESISTANCE IS LESS THAN 30 OHMS.
6. MEN TEE OFF SHALL BE CONNECTED VIA 2 x "C" COMPRESSION CONNECTOR 300mm APART OR CADWELD

NOTES:

1. THIS EARTHING ARRANGEMENT IS FOR BROWN FIELD SITES ONLY, WHERE THERE IS NO OPTION TO OBTAIN THE NORMAL 4000x3500 EASEMENT.
2. EARTHING FOR A PACKAGE SUBSTATION CONSISTS OF FOUR EARTH ELECTRODES IN THE EASEMENT AND IF REQUIRED, THREE EARTH ELECTRODES IN THE CABLE ENTRY TRENCH. ALTERNATIVELY BARE COPPER CABLE MAY BE USED INSTEAD OF EARTH ELECTRODES
3. 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.
4. IF REQUIRED TO ACHIEVE EARTHING REQUIREMENT NOTE 1. 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. SEPERATE THIS LOCAL EARTH NETWORK AS FAR AS POSSIBLE FROM THE M.E.N EARTH NETWORK.
5. 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.
6. FOR MARK 2 SUBSTATION FOUNDATION DETAILS REFER TO DRG NO. S02-02-06-31.
7. FOR MARK 3 SUBSTATION FOUNDATION DETAILS REFER TO DRG NO. S02-02-06-37.
8. M.E.N. EARTH (FROM DISTRIBUTION SYSTEM) MUST NOT BE BROUGHT INTO ELECTRICAL CONTACT WITH FOUNDATION SO THAT TESTING CAN CAN BE CARRIED OUT. M.E.N SHALL BE IN CONDUIT WHERE PASSING THROUGH SUBSTATION FOUNDATION.
9. TRAFFIC BOLLARDS OF A RAIL DESIGN WITHIN EASEMENT, WITH TWO OR MORE FOUNDATIONS SHALL BE CONNECTED TO PERIMETER EARTHING CONDUCTOR BY 70sq.mm COPPER CONDUCTOR WHICH WILL BE SET INSIDE THE POST AND LUGGED OFF ONTO A BARRIER BOLT. POLE BOLLARDS WITH SINGLE FOUNDATION DO NOT REQUIRE EARTHING. CONDUCTIVE STRUCTURES EXTERNAL BUT IN CLOSE PROXIMITY TO EASEMENT SHALL ONLY BE EARTHED IF DEEMED NECESSARY TO DO SO. REFER TO STANDARDS FOR ADVICE AS REQUIRED.
10. BOND THE SUBSTATION FOUNDATION TO THE SUBSTATION EARTH RING VIA 70sqmm BARE COPPER CABLE USING THE M12 FURRELLS EMBEDED IN THE FOUNDATION STAINLESS STEEL FASTENERS TO BE USED.
11. FOR ANY EARTH CONNECTIONS TO EXISTING COPPER FLAT BAR USE CADWELD PLUS CONNECTION. CADWELD IS ALSO PERMITTED AS AN ALTERNATIVE TO CRIMPING. REFER TO DRG S02-01-05-03 FOR DETAILS.
12. APPLY GREEN & YELLOW HEATSHRINK TO LOCAL SUBSTATION EARTH TAIL CONNECTIONS FOR IDENTIF-ICATION PURPOSES, AS TO BE CONSISTANT WITH PREVIOUS INSTALLATIONS BEING INSULATED CABLE

MATERIAL SCHEDULE

ITEM	QTY	DESCRIPTION	ITEM NUMBER	DRG REF
7	4	EQUIPOTENTIAL EARTHING MASONRY WIRE MESH, GALVANISED, 400MM X 7.2MM DIA	288415	-
-	4	EARTHING COMPOUND.(BAG)	10876	-
5	7	COMPRESSION CONNECTOR, "6" PROFILE, 70 sq.mm	257394	S01-01-05-08
4	AR	COMPRESSION CONNECTOR, "C" PROFILE , 70-70 sq.mm	255786	S01-01-05-08
3	AR	EARTH ROD, SS316, 14mm DIA	414060	S01-01-05-01
2	AR	CABLE, Cu, INSULATED, Y/GR, 70 sq.mm	401059	S02-01-01-23
1	AR	70sq.mm BARE COPPER CONDUCTOR.	9803	S01-01-05-05

AMENDMENTS

NO	DESCRIPTION	DRN	DATE	CKD	APPD
8	AMENDED NOTE 9	J.R.	DEC'24	B.B.	B.V.
7	AMENDED EARTH MESH POSITION. AMENDED EARTH RING. UPDATED LOCAL EARTH TAIL TO INSULATED CABLE. ADDED LABELS AND DIMENSION. RE-ADDED ITEM 2. AMENDED LABELS.	P.BH.	JUL'23	B.C.	B.V.
6	UPDATED NOTES, TWO CRIMPS REQUIRED PER CONNECTION OR CADWELD. UPDATE EARTHING DESIGN. REMOVE ITEM 2.	CWM	SEPT'21	B.V.	AN
5	AMEND DIMENSIONS AND ITEM 7 DESCRIPTION	H.E.	OCT'20	B.C.	B.V.
4	INCLUDE REFERENCE TO CAD WELD PLUS	C.C.	NOV'19	B.C.	B.V.
3	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.
2	NOTE 6 EARTH DETAIL ADDED	C.C.	NOV'18	B.V.	B.V.

PowerWater
NORTHERN TERRITORY

DES	A.TAYLOR	POWER STANDARD DRAWING	
DRN	C.COPPINS	EARTHING PACKAGE SUBSTATION MK2 & MK3 CONSTRUCTION DETAILS ON 3500x3500 EASEMENT - BROWN FIELD USE ONLY	
CKD	B.CHEUNG		
APPD	B.CHEUNG		
SCALE	N.T.S.		
ISSUED	AUGUST 2011	A3	DRAWING NUMBER S02-02-05-14
ALL DIM. IN mm			8 AMDT
DRAFTING STANDARD TO A.S.1100		CAD PRODUCT - DO NOT AMEND MANUALLY	