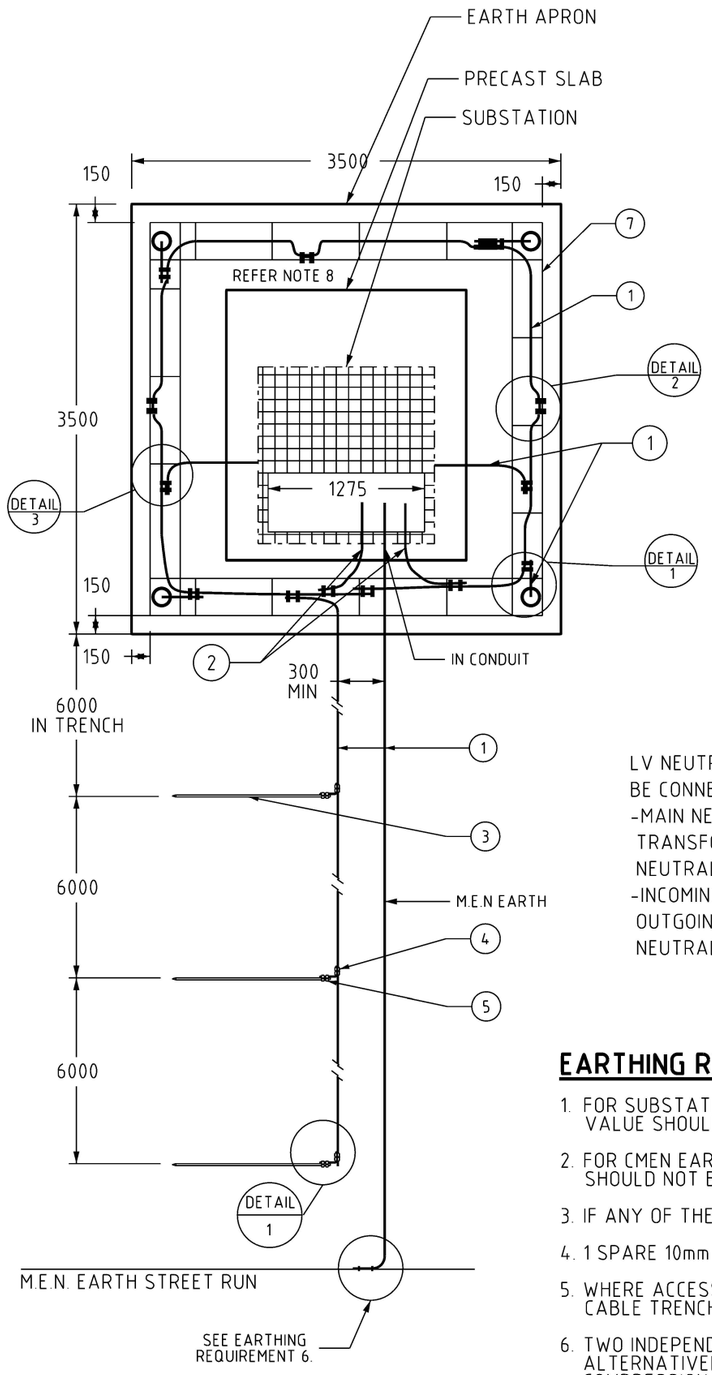
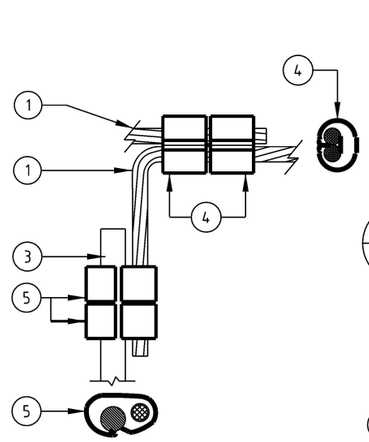
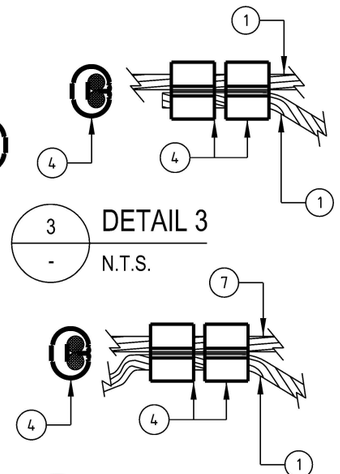


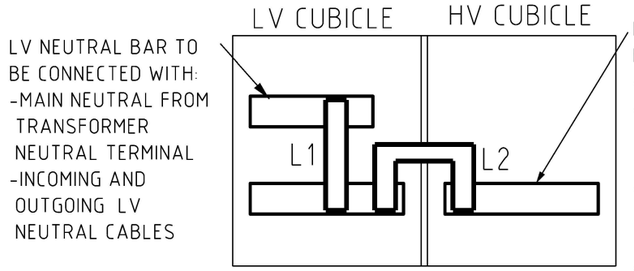


1 DETAIL 1
- N.T.S.



3 DETAIL 3
- N.T.S.

2 DETAIL 2
- N.T.S.



LV NEUTRAL BAR TO BE CONNECTED WITH:
-MAIN NEUTRAL FROM TRANSFORMER NEUTRAL TERMINAL
-INCOMING AND OUTGOING LV NEUTRAL CABLES

HV EARTHING BAR TO BE CONNECTED WITH:
-TRANSFORMER TANK
-INCOMING AND OUTGOING HV CABLE SCREENS
-INCOMING AND OUTGOING HV EARTH (CMEN)
-SUBSTATION EARTH

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. TWO INDEPENDENT EARTHING CONNECTORS MUST BE USED FOR ALL EARTHING INTERCONNECTIONS, ALTERNATIVELY CADWELD MAY BE USED. MEN TEE OFF SHALL BE CONNECTED VIA 2 x "C" COMPRESSION CONNECTOR 300mm APART OR CADWELD.

NOTES:

1. EARTHING FOR A 7000 SERIES PACKAGE SUBSTATION CONSISTS OF FOUR EARTH ELECTRODES IN THE EASEMENT AND IF REQUIRED THREE EARTH ELECTRODES IN THE CABLE ENTRY TRENCH.
2. IN THE EASEMENT: FOUR BORE HOLES TO BE DRILLED AT CORNERS WITH A DISTANCE OF 2.7m APART. 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 sq.mm COPPER CONDUCTOR OR 70sq.mm BARE COPPER CONDUCTOR WITH AN EARTH STAKE ATTACHED VIA TWO PROFILE "6" COMPRESSION CONNECTOR BEFORE LOWERING THE STAKE INTO THE BORE HOLE. ATTACH THE 70 sq.mm 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.
3. 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
4. EQUIPOTENTIAL EARTH GRID OF 300mm WIDTH MINIMUM TO BE LAID ACROSS 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.
5. FOR SUBSTATION FOUNDATION DETAILS, REFER TO DRAWING NO S02-02-06-09 & S02-01-05-13.
6. 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 IN CONDUIT WHERE PASSING THROUGH CONCRETE FOUNDATIONS.
7. 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.
8. WHERE EXTRA ROOM IN FRONT OF THE SUBSTATION IS REQUIRED, THE REAR MOST EDGE OF THE SUBSTATION FOUNDATION CAN BE MOVED BACK AS FAR AS THE OUTER EDGE OF THE EQUIPOTENTIAL EARTH GRID. THE EXTRA AREA BETWEEN THE SUBSTATION DOOR AND THE EQUIPOTENTIAL EARTH RING SHALL BE FILLED WITH EQUIPOTENTIAL EARTH RING, SET IN CONCRETE AND BONDED TO THE SUBSTATION EARTH GRID.
9. BOND THE SUBSTATION FOUNDATION TO THE SUBSTATION EARTH RING VIA 70 sq.mm BARE COPPER CABLE USING THE M12 FERRULES EMBEDED IN THE FOUNDATION, REFER S02-01-04-13. STAINLESS STEEL FASTENERS TO BE USED.
10. 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.
11. APPLY GREEN & YELLOW HEATSHRINK TO LOCAL SUBSTATION EARTH TAIL CONNECTIONS FOR IDENTIF -ICATION PURPOSES, AS TO BE CONSISTANT WITH PREVIOUS INSTALLATIONS BEING INSULATED CABLE.

ITEM	QTY	DESCRIPTION	ITEM NUMBER	DRG REF
7	4	EQUIPOTENTIAL EARTHING MASONRY WIRE MESH, GALVANISED, 400MM X 7.2MM DIA	288415	-
6	4	EARTHING COMPOUND.(BAG)	10876	-
5	AR	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

MATERIAL SCHEDULE

NO	DESCRIPTION	DRN	DATE	CKD	APPD
31	AMENDED NOTE 7.	J.R.	DEC'24	B.B.	B.V.
30	AMENDED EARTH RING. AMENDED EARTH MESH POSITION. UPDATED LOCAL EARTH TAIL TO INSULATED CABLE. RE-ADDED ITEM 2. ADDED & AMENDED LABELS.	P.BH.	JUL'23	B.C.	B.V.
29	UPDATED NOTES. TWO CRIMPS REQUIRED PER CONNECTION OR CADWELD. UPDATE EARTHING DESIGN. REMOVE ITEM 2. ADD NOTES 5 & 6 EARTHING REQUIREMENTS	CWM	OCT'21	A.N.	B.V.
28	UPDATE EARTHING MESH DETAILS.	H.E.	SEP'20	B.C.	B.V.
27	TITLEBLOCK & DRAWING NUMBER FORMATTED	K.T.	FEB'19	C.C.	C.C.

AMENDMENTS

PowerWater
NORTHERN TERRITORY

DES	G.McSHANAG
DRN	T.R.
CKD	S.S.
APPD	R.REYNOLDS
SCALE	1:50
ISSUED	APR'85
ALL DIM. IN mm	

POWER STANDARD DRAWING

EARTHING
PACKAGE SUBSTATION 7000 SERIES
CONSTRUCTION DETAILS

A3 | DRAWING NUMBER S02-02-05-01 | 31 AMDT

DRAFTING STANDARD TO A.S.1100 | CAD PRODUCT - DO NOT AMEND MANUALLY