



ITEM	DESCRIPTION	DWG NO.	STOCK CODE	QTY.
1	POLE - WOOD, TO SUIT (MINIMUM 12.5m x 80mm)		NS128	1
2	POLE STEP	H17720	AS REQ.	
3	3 PHASE TRANSFORMER - STRAP HUNG			
3a	25kVA 1000/433V 3 PHASE TRANSFORMER	180374		
3b	63kVA 1000/433V 3 PHASE TRANSFORMER	180381		
3c	100kVA 1000/433V 3 PHASE TRANSFORMER	180377		
3d	200kVA 1000/433V 3 PHASE TRANSFORMER	180376		
4	100kVA 1000/433V 3 PHASE TRANSFORMER	180383		
4a	TRANSFORMER MOUNTING BRACKET	566101	176642	1
5a	1" BOLT #930	514409	136916	2
5b	1" BOLT #935	514409	136924	2
6	CONDUIT 25mm FLEXIBLE PVC	H8919	AS REQ.	
7	FIBREGLASS COVER FOR TRANSFORMER MOUNTING BRACKET	566374	176961	1
8	LINK EARTH BAR FOR POLE SUBSTATIONS	191592	171069	1
9	ELECTRODE - DRIVEN EARTH, Ø15 x 1800mm	H31631	AS REQ.	
10	COUPLER - EARTH ELECTRODE, TO SUIT Ø15 ROD	H31649	AS REQ.	
11	1" CRIMP CONNECTOR - CU, 70mm² TO Ø15 ELECTRODE	H31699	AS REQ.	
12	'C' CRIMP CONNECTOR - COPPER, COMPRESSION, 70mm² TO 70mm²	177942	AS REQ.	
13	CONDUCTOR - 19/2.14 BLACK PVC INSULATED HD (70mm² EARTH)	60111	AS REQ.	
14	PVC/POLYMERIC CABLE COVER - 150mm WIDE	151084	AS REQ.	
15	PVC STRIP TROUGH FOR EARTH CABLE - 3000mm LONG	259755	AS REQ.	
16	CLOUT - GALVANISED, Ø2.8 x 40mm	175723	AS REQ.	
17	BI-METALLIC CRIMP LINK FOR 95mm² TO 70mm² CABLE	H19797	AS REQ.	
18	CONDUCTOR - SINGLE CORE AL 95mm²	H19797	AS REQ.	
19	BI-METALLIC COMP LUG FOR 95mm² CABLE (190 PACK)	56163	2	
20	LUG - CRIMP, M12, FOR 70mm² COPPER (25 PACK)	31077	74831	AS REQ.
21	FILL SADDLE - SS TO A 5316 FOR 95mm² ALUMINIUM CABLE	AS REQ.		
22	FILL SADDLE - SS TO A 5316 FOR 70mm² COPPER CABLE	AS REQ.		
23	CLAMP 2 BOLT PARALLEL GROOVE - COPPER	176946	1	
24	SPLIT BOLT CLAMP (HENLEY 826) - (20 PACK)	H18915	2	
25	CABLE 95mm² PVC INSULATED (BLACK)	H16194	AS REQ.	
26	LUG - CRIMP, M12, FOR 10mm² COPPER	H19270	1	
27	LUG - CRIMP, M10, FOR 10mm² COPPER (25 PACK)	174849	1	
28	BOLT HEX HEAD STAINLESS STEEL M12 X 30mm (100 PACK)	H38528	8	
29	NUT M12 STAINLESS STEEL (100 PACK)	8987	21	
30	SCREWS SELF DRILLING - Ø12 X 45mm	175667	AS REQ.	
31	WASHER - FLAT, M12, STAINLESS STEEL (100 PACK)	158081	49429	AS REQ.
32	WASHER - BELLEVILLE, M12, STAINLESS STEEL (100 PACK)	158082	175963	AS REQ.
33	LUG - COMPRESSION 2 X M12 AT 50mm CENTRES, FOR 70mm² CU	182659	1	
34	LUG - COMPRESSION 2 X M12 AT 30mm CENTRES, FOR 70mm² CU	176967	1	
35	SIGN - DANGER HIGH VOLTAGE	164702	2	
36	BOLT & NUT - M12, HEX, GALVANISED, LENGTH TO SUIT POLE	155466	AS REQ.	
37	RYE LUG GALV, M12, STAINLESS STEEL	182589	1	
38	WASHER - CONICAL, M20, STAINLESS STEEL - VOLUTE	164376	6 or 7	
39	WASHER - FLAT, M20, M20 x 50 x 3.23, GALV. (50 PACK)	158081	177986	AS REQ.
40	WASHER - SQUARE, M20 x 50 x 50 x 6mm (200 PACK)	H39265	10 or 11	
41	COACH SCREW - M10 x 50mm, GALVANISED (50 PACK)	50559	2	
42	WASHER - M10 x 24mm x 2.21mm, GALVANISED (200 PACK)	177983	2	
43a	FUSE BASE AND CARRIER LV 630A SINGLE CIRCUIT (200 - 200kVA)	117077	90522	3
43b	FUSE BASE AND CARRIER LV 630A DUAL CIRCUIT (200 - 400kVA)	31700	90563	3
44	FUSE (REFER NS122 - SECTION 10.2)			
45	CROSSARM 2700 X 150 X 100	566365	182621	1
46	BRACE CROSSARM 740 X 38 X 38 X 5mm (5 PACK)	46	99119	3
47	GAIN BLOCK - ALUMINIUM 100mm (25 PACK)	166274	2 or 3	
48	LV ABC NEUTRAL CONNECTION PLATE	191510	191761	1
49	BOLT & NUT HEX HEAD GALV M12 x 100mm	44888	2	
50	BOLT & NUT HEX HEAD GALV M12 x 150mm	175752	4	
51	BOLT EYE GALV M20 x 220mm	153563	H37881	AS REQ.
52	BOLT & NUT - M12, HEX, GALVANISED, LENGTH TO SUIT POLE	155466	1	
53	NUT EYE M20 GALV	153951	H38863	1 or 3
54	WASHER FLAT GALV M12 x 32 x 2.71mm (100 PACK)	0	177982	9 or 10
55	WASHER FLAT GALV M16 x 38 x 3.23mm (100 PACK)	177984	16	
56	WASHER - CONICAL, M12, STAINLESS STEEL - VOLUTE	179601	4 or 5	
57	WASHER - CONICAL, M16, STAINLESS STEEL - VOLUTE	164388	7 or 10	
58	WASHER - SQUARE GALVANISED, M16 x 50 x 50 x 6mm (200 PACK)	H39257	4	
59	NUT HEX, M20 GALV. (75 PACK)	175361	2 to 6	
60	SURGE ARRESTER LV 50V SKA	H38993	3	

- NOTES**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH NS122.
  - DRILL Ø2 HOLE FOR CROSSARMS & TRANSFORMER MOUNT SYMMETRICAL TO AXIS OF POLE DRILL Ø16 x 100mm DEEP HOLES FOR POLE STEPS AT 450mm & 900mm CENTRES AND ANGLES AS SHOWN BOTTOM POLE STEP TO BE INSTALLED A MINIMUM 3600mm TO A MAXIMUM 4250mm FROM GROUND. CLEARANCE ABOVE MIDDLE PHASE HV DROP OUT FUSE IS TO BE MAINTAINED BY INSTALLING POLE STEP ON OPPOSITE SIDE.
  - 95mm² ALUMINIUM EARTH CONDUCTORS SHALL BE USED FROM THE BOTTOM EARTH BAR TO 300mm ABOVE GROUND WHERE 70mm² COPPER EARTH CONDUCTORS WILL BE EXTENDED VIA BI-METALLIC LINKS TO THE EARTH ELECTRODES. BLACK 95mm² ALUMINIUM EARTH CONDUCTOR MAY BE A SINGLE CORE OF ABC PVC INSULATED OR XLPE INSULATED CABLE.
  - THE DISTANCE BETWEEN THE HV FEEDER & HV DROP-OUT FUSE CROSSARM MUST BE INCREASED TO 1000mm UP TO A MAXIMUM OF 1500mm WHERE HIGHER LINE CLAMPS ARE USED. THIS IS TO ACHIEVE INCREASED HV FEEDER CLEARANCE OR TO ALLOW FOR SAFE WORKING CLEARANCE TO HV. A HV SUPPORT CROSSARM IS REQUIRED FOR ALL POLES WHICH ARE GREATER THAN 12.5m AND THE DISTANCE BETWEEN HV FEEDER & HV DROP-OUT FUSE CROSSARM IS EQUAL TO OR GREATER THAN 1500mm. THE SUPPORT CROSSARM IS TO BE CONSTRUCTED AS SHOWN, RESPECTIVE OF THE TYPE OF HV MAINS CABLE, NOW OR IN THE FUTURE. THE HV FEEDER AND HV DROP-OUT FUSE CROSSARM REFER TO DRAWINGS 228823 & 228825 FOR DETAILS.
  - HV DROP-OUT CABLE IS TO BE SUPPORTED AT THE TOP USING INSULATOR & SUSPENSION. CLAMP ITEMS 75 & 76, THE BOTTOM CABLES ARE TO BE SECURED USING TWO 70mm wide cable LUGS WITH ITEM 66. HEAVY DUTY 35mm² LUGS MUST BE INSTALLED OVER 190 T.S. CUT 25mm 7" IN CONDUIT UNDER SUSPENSION. REFER TO DRAWING 228824 FOR COMPLETE TERMINATION OF CABLE INTO LUG TUNNEL. HEAVY DUTY LUGS WITH HEAT SHRINK ACCEPTABLE FOR SURGE ARRESTER. REFER TO DWG 228824.
  - SURGE ARRESTER MOUNTING BAR IS NOT SUPPLIED WITH TRANSFORMER. INSTALL ARRESTER MOUNTING BRACKET (1 STOCK CODE 180271) AND COPPER EARTH BAR (1 STOCK CODE H3762) MAXIMUM ALLOWABLE TORQUE AS REFERRED TO IN NS122.
  - NO LV SERVICE CABLES OR COMMUNICATION CABLES SHALL BE INSTALLED THROUGH HV DROP-OUT CABLES AND A MINIMUM 900mm distance to be maintained between LV and HV.
  - SEGREGATED EARTHING SYSTEM (ITEM 12) - REFER DRAWING 224493 ONLY REQUIRED WHERE A SEGREGATED EARTHING SYSTEM IS INSTALLED.
  - IF A LV LUG IS REQUIRED IT IS TO BE INSTALLED ON THE NON CLIMBING SIDE, OPPOSITE TO THE ROADWAY. LV LUGS CABLES MUST NOT EXCEED 50mm². LV LUG CABLE INSTALLATION AND MAXIMUM NUMBER PRINTED IS DETAIL IN NS122 AND NS22.
  - COMMUNICATIONS CABLES MUST BE INSTALLED ON THE CROSSARM, MOUNTING DIRECTLY ON THE POLE OR USING STANDOFF BRACKET IS NOT PERMITTED. COMMUNICATION CROSSARM SHALL ONLY BE INSTALLED IN EXISTING AREAS IF A COMMUNICATION CABLE ALREADY EXISTS. THERE ARE 2 OPTIONAL CROSSARM SIZES (ITEMS 13a & 13b) THAT CAN BE USED DEPENDING ON LOCATION OF EXISTING CABLE AND STANDOFF THAT IS REQUIRED. BOTH CROSSARM SIZES REQUIRE HOLES TO BE DRILLED ON SITE - REFER TO DWG 228823 FOR DRILLING AND CLEARANCE DETAILS. CABLES ARE TO BE MAINTAINED AS PER NS22. THE COMMUNICATIONS CATERPillar CABLE SHALL BE INSULATED 2000mm EITHER SIDE OF THE POINT OF ATTACHMENT USING MINIMUM 6.6/11V RATED INSULATION, UV STABILISED. THE COMMUNICATIONS CABLE SHALL BE INSTALLED ON THE PROPERTY SIDE OF POLE. CONDUIT UNDER CROSSARM MAY BE MOUNTED ON TRANSFORMER CROSSARM OR TO NS4 FOR REQUIREMENTS REGARDING MASTER MAP POLE NUMBER. SUBSTATION NUMBER PLATE AND MASTER MAP NUMBER REQUIREMENTS ARE SUPPLIED FREE ISSUE BY AUSGRID.
  - INSULATION TO BE INSTALLED OVER 190 T.S. CUT 25mm 7" IN CONDUIT UNDER SUSPENSION. REFER TO DRAWING 228824 FOR COMPLETE TERMINATION OF CABLE INTO LUG TUNNEL. HEAVY DUTY LUGS WITH HEAT SHRINK ACCEPTABLE FOR SURGE ARRESTER. REFER TO DWG 228824.
  - SECURE TRANSFORMER KICKPLATE TO POLE USING M12 BOLT. IF NO KICK PLATE IS SUPPLIED WITH TRANSFORMER INSTALL 100mmx100mmx5mm CROSSARM 50mm WIDE AT A DEPTH OF 25mm TO ALLOW HEAD OF BOLT TO BE RECEIVED FOR TRANSFORMER TANK.
  - SECURE TRANSFORMER TO TRANSFORMER MOUNTING BRACKET USING 2mm BOLTS (ITEM 79) THROUGH HANGING STRAPS. REFER TO DETAIL 'C' AND DWG 566101 FOR TRANSFORMER MOUNTING BRACKET ASSEMBLY AND INSTALLATION DETAILS.
  - THE POLE SHALL BE SET IN CONCRETE FROM THE EDGE OF THE HOLE TO THE POLE AND FROM THE POLE BOLT TO 400mm BELOW FINAL GROUND LEVEL. THE CONCRETE SHALL BE WET MIXED AND TAPPED EVERY 200mm DURING INSTALLATION.
  - DMIC TO BE INSTALLED ON 400kVA TRANSFORMERS ONLY. THE MDIS IS NOT REQUIRED WHEN DMIC IS INSTALLED. THE MDIS MAY BE LOWERED TO ENSURE COMMUNICATION CROSSARM CABLES DO NOT IMPEDE MDIS MOUNTING AND ACCESS.
  - C'S ARE SUPPLIED WITH PRE-WIRED LENGTHS OF FLEXIBLE CABLE AND ARE TO BE MOUNTED ON THE LOAD SIDE OF DISTRIBUTOR FUSE SECURED BY CABLE USE THE SADDLES OR FLEXIBLE CONDUIT TO SECURE CABLE ON CROSSARM AS REFERRED TO IN NS22.
  - THE ORIENTATION OF THE POLE SHALL BE ALIGNED WITH CORRECT HV PHASING. HV CROSSING IS NOT PERMITTED AT THE POLE TRANSFORMER, WHERE POSSIBLE POLE CLIMBING ACCESS IS TO BE ON THE POLE SIDE OPPOSITE TO TRAFFIC DIRECTION AS PER NS122.

SCALE	DESIGNED	CHECKED	APPROVED	DATE
AS SHOWN	C. HABUTTI	P. JARVIS	G. BURGE	16/09/2012
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**CONSTRUCTION**

NETWORK RISK AND PLANNING  
PRIMARY SYSTEMS  
OPERATIONAL SUBSTATION ENGINEERING  
876 GEORGE STREET, SYDNEY

**Ausgrid**

STANDARD CONSTRUCTION  
3 PHASE - 11kV POLE MOUNTED  
DISTRIBUTION SUBSTATION  
0 - 400kVA  
GENERAL ARRANGEMENT

SCALE: B1  
DRAWING NO: 228821  
SHEET: 1 OF 4