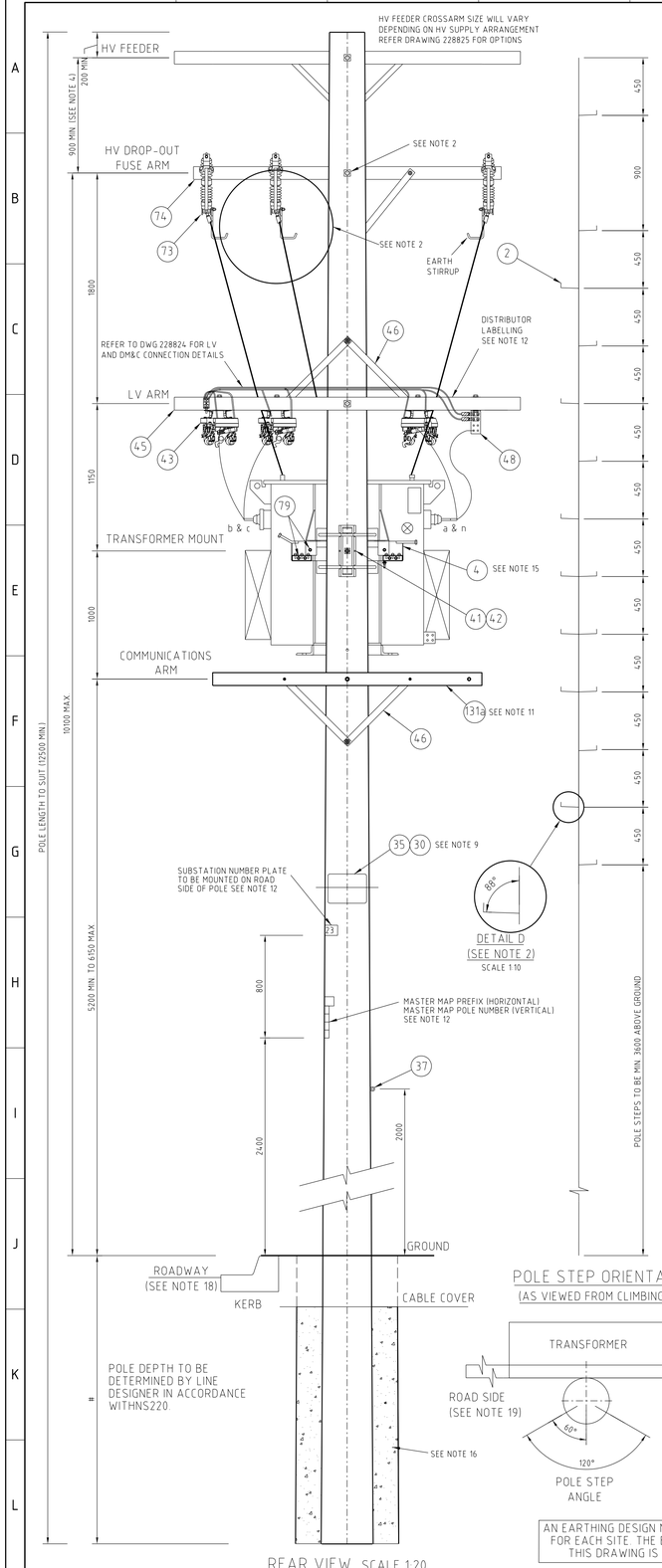

ITEM	DESCRIPTION	DWG NO	STOCK CODE	QTY
1	POLE - WOOD, TO SUIT (MINIMUM LENGTH 12.5m, MINIMUM STRENGTH 8kN)		NS128	1
2	STEP - POLE, SCREW-IN	250144	185198	AS REQ.
3	3 PHASE TRANSFORMER - STRAP HUNG			1
3a	25kVA 11000/433V 3 PHASE TRANSFORMER		180374	
3b	63kVA 11000/433V 3 PHASE TRANSFORMER		180381	
3c	100kVA 11000/433V 3 PHASE TRANSFORMER		180377	
3d	200kVA 11000/433V 3 PHASE TRANSFORMER		180376	
3e	400kVA 11000/433V 3 PHASE TRANSFORMER		180383	
4	TRANSFORMER MOUNTING BRACKET	566101	176962	1
5a	'U' BOLT Φ330	514409	H36916	2
5b	'U' BOLT Φ355	514409	H36924	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	151592	177069	1
9	ELECTRODE - DRIVEN EARTH, Φ15 x 1800mm		H31631	AS REQ.
10	COUPLER - EARTH ELECTRODE, TO SUIT Φ15 ROD		H31649	AS REQ.
11	'P' CRIMP CONNECTOR - CU, 70mm² TO Φ15 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 COVER STRIP TROUGHING FOR EARTH CABLE - 3000mm LONG	205775	157552	4
16	SELF DRILLING TIMBER SCREW TYPE 17 10g x25mm		184996	AS REQ.
17	BI-METALLIC CRIMP LINK FOR 95mm² TO 70mm² CABLE		H107797	2
18	CONDUCTOR - SINGLE CORE AL 95mm²		SEE NOTE 3	AS REQ.
19	BI-METALLIC CRIMP LUG FOR 95mm² CABLE (10 PACK)		58743	2
20	LUG - CRIMP, M12, FOR 70mm² COPPER (25 PACK)	31077	74831	AS REQ.
21	GALVANISED SADDLE FOR 95mm² ALUMINIUM CABLE			AS REQ.
22	GALVANISED SADDLE FOR 70mm² COPPER CABLE		176494	AS REQ.
23	CLAMP 2 BOLT PARALLEL GROOVE - COPPER		176946	1
24	SPLIT BOLT CLAMP (HENLEY B26) - (20 PACK)		H18815	2
25	CABLE 16mm² PVC INSULATED (BLACK)		H14934	AS REQ.
26	LUG - CRIMP, M12, FOR 16mm² COPPER		H110270	1
27	LUG - CRIMP, M10, FOR 16mm² COPPER (25 PACK)		74849	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 - #12 X 45mm		175567	AS REQ.
31	WASHER - FLAT, M12, STAINLESS STEEL (100 PACK)	518081	49429	AS REQ.
32	WASHER - BELLEVILLE, M12, STAINLESS STEEL (100 PACK)	518082	175903	AS REQ.
33	LUG - COMPRESSION 2 X M12 AT 50mm CENTRES , FOR 70mm² CU.		182609	1
34	LUG - COMPRESSION 2 X M12 AT 30mm CENTRES , FOR 70mm² CU.		176967	1
35	SIGN - DANGER HIGH VOLTAGE		H47012	2
36	BOLT & NUT - M20, HEX, GALVANISED, LENGTH TO SUIT POLE	515466		AS REQ.
37	EYED LAG BOLT, M8 x 110mm, STAINLESS STEEL		182589	1
38	WASHER - CONICAL, M20, STAINLESS STEEL - VOLUTE		146316	6 or 7
39	WASHER - FLAT ROUND, M20 x 44.5 x 3.23, GALV. (50 PACK)	518081	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 (150 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 (25 - 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)	0		
45a	CROSSARM - 2700 X 150 X 100mm, HARDWOOD (LV ABC)	566345	176221	1
45b	CROSSARM - 3300 X 150 X 100mm, HARDWOOD (LV OPEN WIRE)	167283	H23020	1
46	BRACE CROSSARM 740 X 38 X 38 X 5mm (5 PACK)	46	99119	3
47	GAIN BLOCK - ALUMINIUM 100mm (25 PACK)		146274	2 or 3
48	LV ABC NEUTRAL CONNECTION PLATE	151570	149161	1
49	BOLT & NUT HEX HEAD GALV M12 x 180mm		46888	2
50	BOLT & NUT HEX HEAD GALV M16 x 150mm		175672	4
51	BOLT EYE GALV M20 x 200mm	513653	H37881	AS REQ.
52	BOLT & NUT - M12, HEX, GALVANISED, LENGTH TO SUIT POLE	515466		1
53	NUT, EYE M20 GALV.	513951	H38853	1 to 3
54	WASHER FLAT GALV M12 x32 x 2.71mm (100 PACK)	0	177982	9 or 10
55	WASHER FLAT GALV M16 x38 x 3.23mm (100 PACK)		177984	14
56	WASHER - CONICAL, M12, STAINLESS STEEL - VOLUTE		179601	4 or 5
57	WASHER - CONICAL, M16, STAINLESS STEEL - VOLUTE		146308	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 500V 5KA		H31893	3
61a	COVER HV BUSHING (ALSO USE FOR LV 100 - 400kVA)		H21858	3 or 6
61b	COVER LV BUSHING (25 - 100kVA)		H22032	3
62a	LUG COMPRESSION LONG BARREL M12 TO SUIT 95mm² CU CABLE		151050	6
62b	LUG COMPRESSION M12 TO SUIT 185mm² CU CABLE		90183	6
62c	LUG COMPRESSION M12 TO SUIT 240mm² CU CABLE		179574	6
63a	LUG COMP. 2 HOLE (30mm CENTRES) M12 TO SUIT 95mm² CU CABLE		176968	1
63b	LUG COMP. 2 HOLE (30mm CENTRES) M12 TO SUIT 185mm² CU CABLE		176952	1
63c	LUG COMP. 2 HOLE (30mm CENTRES) M12 FOR 240mm² CU CABLE		179575	1
64a	LUG COMP. 2 HOLE (50mm CENTRES) M12 TO SUIT 95mm² CU CABLE		182628	1
64b	LUG COMP. 2 HOLE (50mm CENTRES) M12 TO SUIT 185mm² CU CABLE		182629	1
64c	LUG COMP. 2 HOLE (50mm CENTRES) M12 FOR 240mm² CU CABLE		182630	1
65	BOLT HEX HEAD STAINLESS STEEL M12 X 40mm (50 PACK)		45146	13
66	CABLE TIE BLACK 380 X 7.6mm (100 PACK)		59907	AS REQ.
67	CABLE - REFER TO TABLE 1 ON DWG. 228824			
67a	CABLE 95mm² CU PVC INSULATED BLACK		59584	AS REQ.
67b	CABLE SINGLE CORE CU 185mm² XLPE INSULATED BLACK		61432	AS REQ.
67c	CABLE SINGLE CORE CU 240mm² INSULATED BLACK		179163	AS REQ.
68	HEATSHRINK - MEDIUM AND THICK WALL MASTIC LINED			AS REQ.
69	BOLT HEX HEAD STAINLESS STEEL M12 X 25mm (100 PACK)		44693	5 or 10
70a	LUG BI-METALLIC COMP. M12 TO SUIT 150mm² CABLE (10 PACK)		150441	3 or 6
70b	LUG BI-METALLIC COMP. M12 TO SUIT 95mm² CABLE (10 PACK)		58743	3 or 6
71a	LUG BI-METALLIC COMPRESSION 2 X M12 TO SUIT 150mm² CABLE		177073	1 or 2
71b	LUG BI-METALLIC COMPRESSION 2 X M12 TO SUIT 95mm² CABLE		177074	1 or 2
73a	DROPOUT FUSE BASE AND CARRIER 12/24KV TYPE EXPULSION		H84350	3
73b	FUSE BASE, DROPOUT, 12KV, S & C TYPE SMD-20		H70029	3
74	CROSSARM 2400 X 100 X 100	566345	176222	1
75	INSULATOR 22KV POLYMERIC LONG-ROD		150375	3
76	CLAMP SUSPENSION LV (30 PACK)		H113472	3
77	PLATE, TWISTED, GALV 150 X 50 x 6mm	151086	176901	3
79	BOLT & NUT HEX HEAD GALV M12 X 130mm		46805	7 or 8
80	BOLT & NUT HEX HEAD GALV M16 X 160mm		47043	3
81	SCREW COACH HEX HEAD GALV M12 X 90mm (25 PACK)		50443	2 or 3
82	BOLT HEX HEAD STAINLESS STEEL M16 X 40mm (25 PACK)		H38413	3
83	WASHER - FLAT, M16, 30 x 1.5mm STAINLESS STEEL (100 PACK)		H39621	6
84	NUT NYLOC, M16 STAINLESS STEEL (50 PACK)		177122	3
85	CABLE 11KV 35mm² CU LDPE INSULATED 19/1.53		H14578	AS REQ.
86	LUG KIT HEAVY DUTY TO SUIT 11kV LDPE CABLE (3 SET)		H125260	1
87	LUG COMPRESSION M12 TO SUIT 16mm² 11KV LDPE CABLE		H110270	6
88	ARRESTERS SURGE 11kV		111948	3
89	HEATSHRINK TERMINATION KIT FOR HV DROPPER LUGS		152207	1
90	CABLE 11kV 16mm² CU LDPE INSULATED		6205	AS REQ.
91	MAXIMUM DEMAND INDICATOR /ENCLOSURE AND WIRED UNIT	164578	178641	1
92	SADDLE CONDUIT GALV M20 (100 pack)		176493	AS REQ.
93	COACH BOLT M12 x 50mm (300 PACK)		50476	4
94	CROSSARM 2400 X 100 X 100	228823	71589	AS REQ.
	SEGREGATED EARTHING OPTION			
121	LV SURGE ARRESTER NEUTRAL (SEGREGATED ONLY)		98939	1
122	SEGREGATED EARTHING SIGN	224403	182387	NOTE 8
	COMMUNICATION CROSSARM OPTION		SEE NOTE 11	
131a	CROSSARM 2100 X 150 X 100	228823	H23745	
131b	CROSSARM 2400 X 100 X 100	228823	71589	
132	BRACE CROSSARM 490 X 40 X 5mm	46	76745	
	LV CROSSARM SUPPORT OPTION			
141	DEADEND PRE-FORMED TO SUIT 19/2.00 GALV. STEEL		58859	3 or 6
142	INSULATOR GUY TYPE GY2		74997	1 or 2
143	CONDUCTOR 19/2.00 GALV. STEEL		H10485	AS REQ.
144	THIMBLE CLEVIS TO SUIT 19/2.00 GALV. STEEL		448	1 or 2
145	GUY LOCK TO SUIT 19/2.00 GALV. STEEL		59063	1 or 2

NOTES.

1. THIS DRAWING IS TO BE USED FOR THE CONSTRUCTION OF 0-400kVA 11kV 3 PHASE POLE MOUNTED DISTRIBUTION SUBSTATIONS.
2. DRILL Φ22 HOLES FOR CROSSARMS & TRANSFORMER MOUNT SYMMETRICAL TO AXIS OF POLE. DRILL Φ14 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 4050mm FROM GROUND. CLEARANCE AROUND MIDDLE PHASE HV DROP OUT FUSE IS TO BE MAINTAINED BY INSTALLING POLE STEP ON OPPOSITE SIDE.
3. 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 BIMETALIC LINKS TO THE EARTH ELECTRODES. BLACK 95mm² ALUMINIUM EARTH CONDUCTOR MAY BE A SINGLE CORE OF ABC, PVC INSULATED OR XLPE INSULATED CABLE.
4. THE DISTANCE BETWEEN THE HV FEEDER & HV DROP-OUT FUSE CROSSARM MUST BE INCREASED TO 1200mm (UP TO A MAXIMUM OF 1500mm) WHERE HOT 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 INSTALLATIONS 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 IRRESPECTIVE OF THE TYPE OF HV MAINS CABLE, MIDWAY BETWEEN THE HV FEEDER AND HV DROP-OUT FUSE CROSSARM. REFER TO DRAWINGS 228823 & 228825 FOR DETAILS.
5. HV DROPPER CABLES TO BE SUPPORTED AT THE TOP USING INSULATOR & SUSPENSION CLAMP (ITEMS 75 & 76). THE BOTTOM CABLES ARE TO BE SECURED USING TWO 7.6mm WIDE CABLE TIES (ITEM 66). HEAVY DUTY 35mm² LUGS MUST BE USED ON DROPPER CABLES. TWO (2) CRIMP OPERATIONS ARE REQUIRED FOR COMPLETE TERMINATION OF CABLE INTO LUG TUNNEL. HEAVY DUTY 16mm² LUGS WITHOUT HEATSHRINK ACCEPTABLE ON SURGE ARRESTER. REFER TO DWG 228824.
6. IF SURGE ARRESTER MOUNTING BAR IS NOT SUPPLIED WITH TRANSFORMER, INSTALL ARRESTER MOUNTING BRACKET (STOCKCODE 180271) AND COPPER EARTH BAR (STOCKCODE H31762). MAXIMUM ALLOWABLE TORQUE ON ARRESTER IS 27Nm. TORQUE WRENCH MUST BE USED TO ENSURE ARRESTER IS NOT DAMAGED.
7. NO LV SERVICE CABLES OR COMMUNICATION CABLES SHALL BE INSTALLED THROUGH HV DROPPER CABLES AND A MINIMUM 350mm DISTANCE BE MAINTAINED BETWEEN LV AND HV.
8. SEGREGATED EARTHING SIGN (ITEM 122 - REFER DRAWING 224403) ONLY REQUIRED WHERE A SEGREGATED EARTHING SYSTEM IS INSTALLED.
9. DANGER SIGN TO BE BENT AROUND POLE BEFORE SECURING.
10. IF A LV UGOH IS REQUIRED IT IS TO BE INSTALLED TO THE REQUIREMENTS OF NS127. SELF DRILLING SCREWS ARE TO BE USED TO FIX CABLE COVERS AND SADDLES TO THE POLE.
11. 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 131a & 131b) 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 DETAILS. ENSURE GROUND CLEARANCES ARE MAINTAINED AS PER NS220. THE COMMUNICATIONS CATENARY CABLE SHALL BE INSULATED 2000mm EITHER SIDE OF THE POINT OF ATTACHMENT USING MINIMUM 0.6/1kV RATED INSULATION, UV STABILISED. THE COMMUNICATIONS CABLE SHALL BE INSTALLED ON THE PROPERTY SIDE OF POLE. COMMUNICATION CROSSARM MAY BE MOUNTED ON TRANSFORMER SIDE OF POLE IF 700mm WORKING CLEARANCE IS MAINTAINED TO 11kV TRANSFORMER BUSHINGS.
12. REFER TO NS158 FOR REQUIREMENTS REGARDING DISTRIBUTOR LABELLING AND SUBSTATION NUMBER PLATE. REFER TO NS148 FOR REQUIREMENTS REGARDING MASTER MAP POLE NUMBER. SUBSTATION NUMBER PLATE AND MASTER MAP POLE NUMBERING ARE SUPPLIED FREE ISSUE BY AUSGRID.
13. INSULATION TO BE INSTALLED OVER 'U' BOLTS , CUT 25mm 'V' IN CONDUIT UNDER FIBREGLASS COVER TO DRAIN ANY WATER.
14. SECURE TRANSFORMER KICKPLATE TO POLE USING M12 BOLT. IF NO KICK PLATE IS SUPPLIED WITH TRANSFORMER INSTALL 800mmx100mmx75mm CROSSARM USING ITEMS 36, 38 & 39 (CUT SLOT IN CROSSARM 50mm WIDE AT A DEPTH OF 25mm TO ALLOW HEAD OF BOLT TO BE RECESSED FORM TRANSFORMER TANK.
15. SECURE TRANSFORMER TO TRANSFORMER MOUNTING BRACKET USING 12mm BOLTS (ITEM 79) THROUGH HANGING STRAPS. REFER TO DETAIL 'C' AND DWG 566101 FOR TRANSFORMER MOUNTING BRACKET ASSEMBLY AND INSTALLATION DETAILS.
16. THE POLE SHALL BE BACKFILLED AS PER ARR-3 ON DRG. 508726 (CEMENT STABILISED BACKFILL).
17. THE MDI MAY BE LOWERED TO ENSURE COMMUNICATION CROSSARM BRACES DO NOT IMPEDE MDI MOUNTING AND ACCESS.
18. 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.
19. REFER TO DESIGNER SAFETY REPORT D20/479531 FOR TYPICAL HAZARDS ASSOCIATED WITH THIS STANDARD CONSTRUCTION.

DWN: PATRICIA RIOS	APPD by: GLENN FORD
CHKD: PHILLIP JONES	DWN: P.RIOS
DATE: 10/7/2020	CHKD: P. JONES
NOTES AMENDED.	DATE: 28/8/2021
6	7
DWN: P.R.	APPD by: G.FORD
CHKD: P.J.	DWN: P.RIOS
APPD: G.F.	CHKD: P. JONES
DATE: 15/05/2025	DATE: 16/8/2021
ITEM 48b ADDED.	ITEM 48 & 48a MATERIAL LIST AMENDED.
8	8

CAD DRAWING
DO NOT MANUALLY AMEND.

A 1. UPDATED TO INCLUDE 3PHASE OPTION FOR 400kV TX. POLE STEP CLEARANCE NOTE 2 AMENDED NOTE 4 ADDED ITEMS 111 TO 119 ADDED PN PM02-20213-0-0-0010 P/N PM02-20213-0-21013 C.MABBUTT 15/10/14 CHECKED P.JARVIS APPROVED D.GRCEV

B 2. ITEMS 131a &131b AMENDED ITEM 131c REMOVED ITEM 132 ADDED NOTES 2 & 11 AMENDED NOTE 19 ADDED ITEM 48a ADDED HV DROPOUT FUSE DETAIL UPDATED CURRENT TRANSFORMER P/N PM02-20213-0-21013 C.MABBUTT 15/10/14 CHECKED P.JARVIS APPROVED D.GRCEV

C 3. HV SUPPORT CROSSARM ADDED IN FRONT VIEW NOTE 4 AMENDED ITEM 94 ADDED ITEMS 3a TO 3e REFERENCE DRAWINGS UPDATED. ITEM 115b STOCK CODE AMENDED NOTES 11 & 15 AMENDED ITEM 79 QUANTITY ADDED P/N DPEX-06568-1-1-6 C.MABBUTT 27.2.15 CHECKED P.JARVIS APPROVED P.JARVIS

D 4. NEW EARTH STIRRUP ADDED P/N DPEX-06568-1-1-6 C.MABBUTT 15.5.15 CHECKED P.JARVIS APPROVED D.GRCEV

E 5. DRAWING TITLE ALTERED TO TIMBER POLE DRAWING 228827 ADDED NOTE 1 AND ENDORSEMENT CHANGED TO RECORD ALTERED TO NEW NOTE 4 ALTERED TO CLARIFY WHEN A HV SUPPORT CROSSARM IS REQUIRED NOTE 10 UPDATED ITEM 86 CHANGED TO SELF DRILLING SCREWS ITEM 87 CHANGED TO GALVANISED SADDLES ITEM 120 ADDED ITEM 121 ADDED P.JARVIS 15.18

F 6. NOTES 6 & 7 AMENDED

G 7. ITEM 48b ADDED

H 8. ITEM 48 & 48a MATERIAL LIST AMENDED.

I

J

K

L

M

TIMBER POLE FOOTING ARRANGEMENT	508726
POLE TRANSFORMER - 3 PHASE - EARTHING CONNECTION DETAILS	228822
POLE TRANSFORMER - 3 PHASE - CROSSARM DETAILS	228823
POLE TRANSFORMER - 3 PHASE - LV Tx, LV ABC & DM&C CONNECTIONS	228824
POLE TRANSFORMER - 3 PHASE - HV OVERHEAD SUPPLY OPTIONS	228825
POLE TRANSFORMER - 3 PHASE - STREET LIGHTING DETAIL OPTION	228826
POLE TRANSFORMER - 3 PHASE - LV OPEN WIRE CONNECTIONS	228827
TRANSFORMER MOUNTING BRACKET MANUFACTURING AND ASSEMBLY	566101

ASSOCIATED DRAWINGS

NETWORK STANDARD
Ausgrid
145 NEWCASTLE RD WALLSEND, NSW 2287

SCALE	AS SHOWN
DESIGNED	-
DRAWN	C.MABBUTT
CHECKED	P.JARVIS
APPROVED	D.GRCEV
DATE	15/10/12
PROJECT NUMBER	STD
PROJTRAK NUMBER	-

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

SIZE B1 | DRAWING No 228821 | SHEET 1 | AMD 9

20110923

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