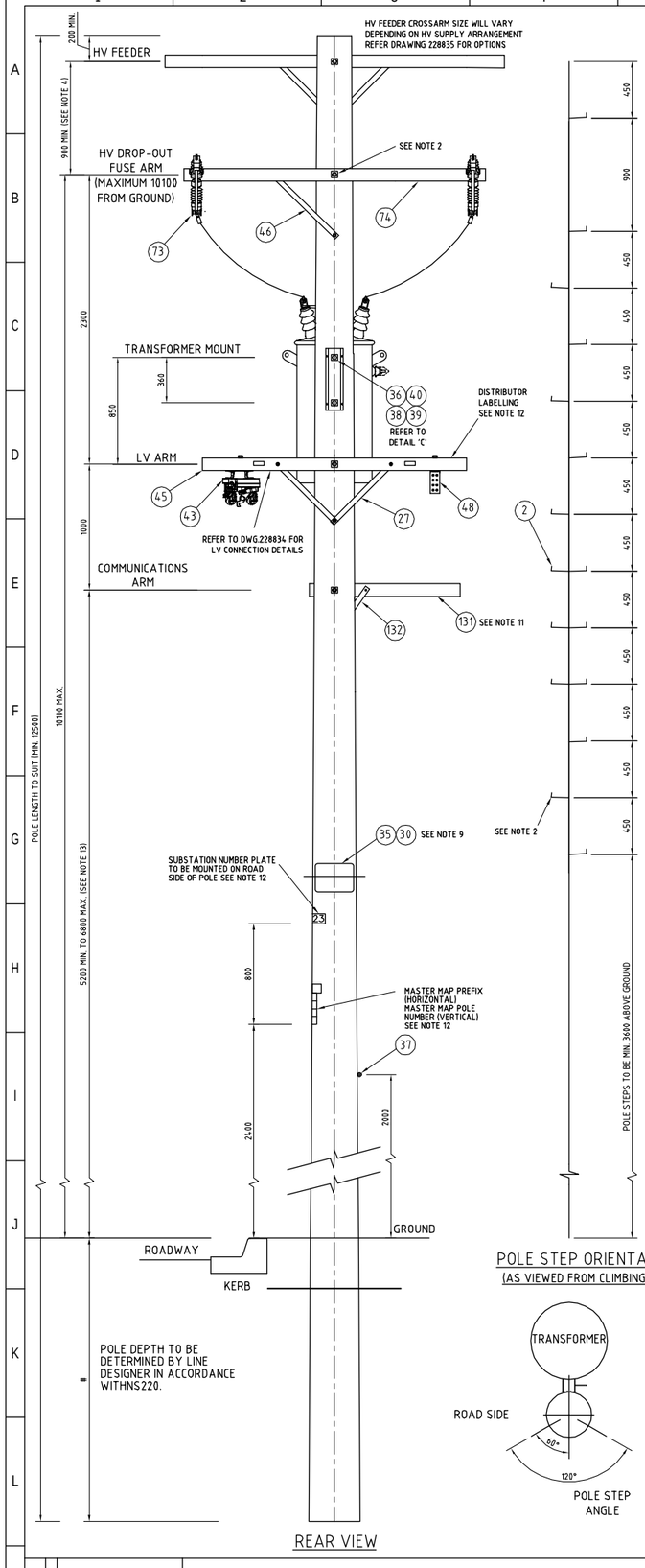
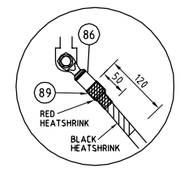
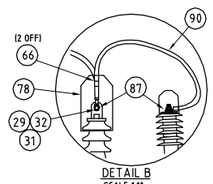
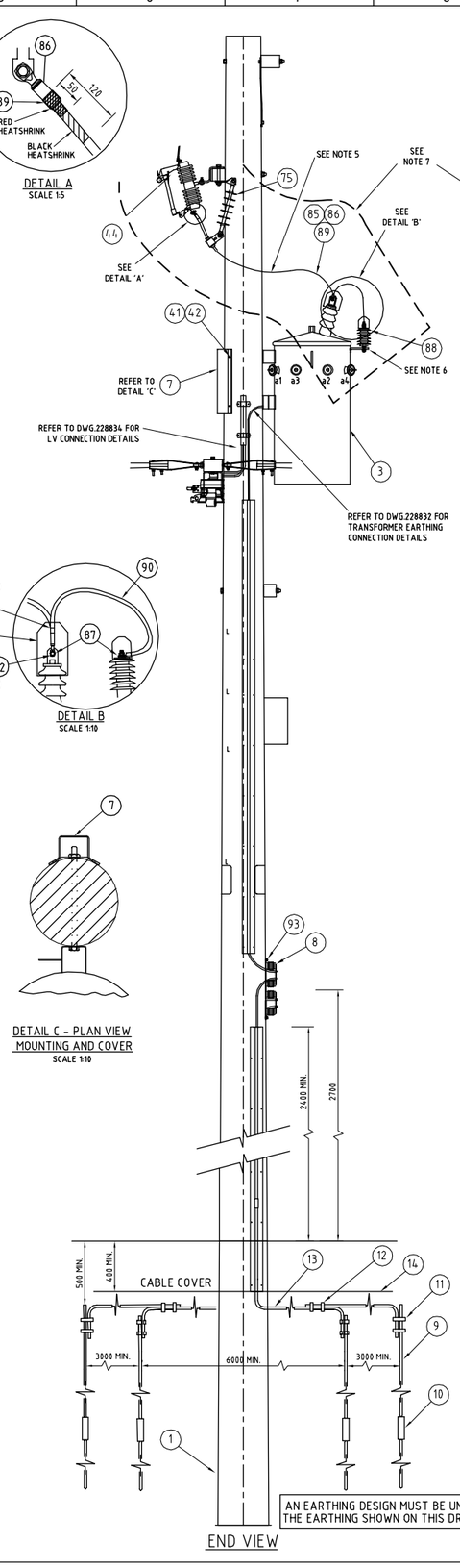
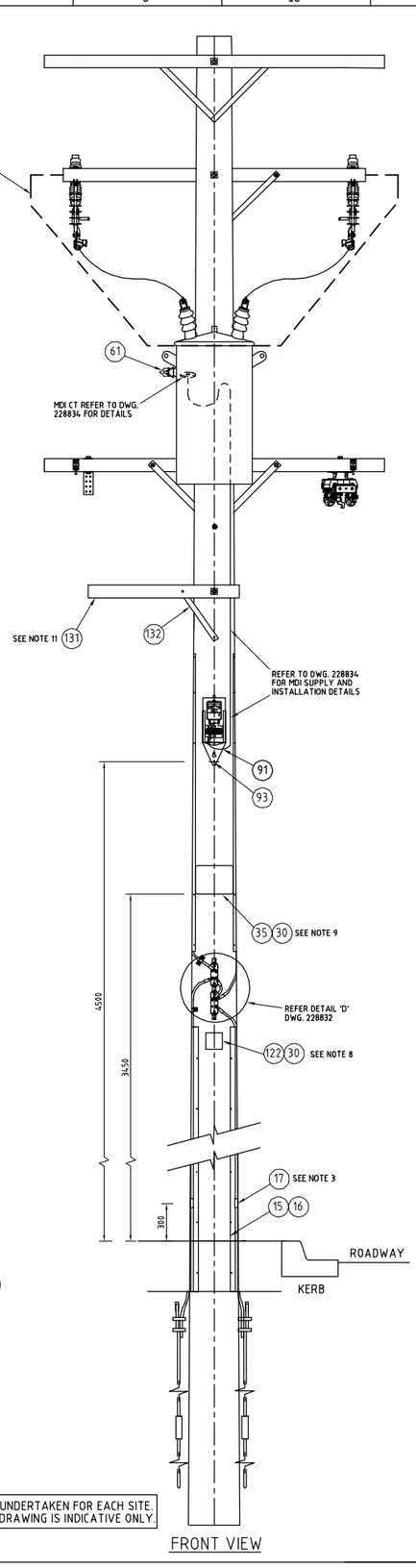








AN EARTHING DESIGN MUST BE UNDERTAKEN FOR EACH SITE. THE EARTHING SHOWN ON THIS DRAWING IS INDICATIVE ONLY.



ITEM	DESCRIPTION	DWG. NO.	STOCK CODE	Q.TY.
1	POLE - WOOD, TO SUIT (MINIMUM 12.5m x 8.0kN)		NS128	1
2	POLE STEP		H17720	AS REQ.
3	SINGLE PHASE TRANSFORMER - POLE HUNG			1
3a	16kVA 11000/500-250V SINGLE PHASE TRANSFORMER		180380	
3b	25kVA 11000/500-250V SINGLE PHASE TRANSFORMER		180375	
3c	63kVA 11000/500-250V SINGLE PHASE TRANSFORMER		180365	
3d	25kVA 22000/500-250V SINGLE PHASE TRANSFORMER		180373	
4				
5a	SADDLE 25mm - GALV.		66043	AS REQ.
5b	SADDLE 40mm - GALV.		H9290	AS REQ.
5c	SADDLE 50mm - GALV.		66019	AS REQ.
6a	CONDUIT 25mm FLEXIBLE PVC		H8919	AS REQ.
6b	CONDUIT 40mm FLEXIBLE PVC		H8935	AS REQ.
6c	CONDUIT 50mm FLEXIBLE PVC		176570	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, ø15 x 1800mm		H31631	AS REQ.
10	COUPLER - EARTH ELECTRODE, TO SUIT ø15 ROD		H31649	AS REQ.
11	'P' 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 COVER STRIP TROUGHING FOR EARTH CABLE - 3000mm LONG	205775	157552	4
16	CLOUT - GALVANISED, ø2.8 x 40mm		175723	AS REQ.
17	BI-METALLIC CRIMP LINK FOR 95mm² TO 70mm² CABLE		H107797	2
18	CONDUCTOR - SINGLE CORE OF 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	FULL SADDLE - SS TO A.S316 FOR 95mm² ALUMINIUM CABLE			AS REQ.
22	FULL SADDLE - SS TO A.S316 FOR 70mm² COPPER CABLE			AS REQ.
23	CLAMP 2 BOLT PARALLEL GROOVE - COPPER		176946	1
24	SPLIT BOLT CLAMP (HENLEY B26) - (20 PACK)		H18815	1 or 2
25	LUG - CRIMP, M12, FOR 10mm² COPPER			1
26				
27	BRACE CROSSARM 690 X 40 X 5mm	514385	H17738	2 or 3
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	32
32	WASHER - BELLEVILLE, M12, STAINLESS STEEL (100 PACK)	518082	175903	21
33	BOLT & NUT HEX HEAD GALV M16 x 130mm		46979	2
34	LUG - COMPRESSION 2 X M12 AT 30mm CENTRES , FOR 70mm² CU.		176967	1
35	SIGN - DANGER HIGH VOLTAGE		HK7012	2
36	BOLT & NUT - M20, HEX, GALVANISED, LENGTH TO SUIT POLE	515466		4 or 5
37	EYED LAG BOLT, M8 x 110mm, STAINLESS STEEL		182589	1
38	WASHER - CONICAL, M20, STAINLESS STEEL - VOLUTE		146316	4 or 6
39	WASHER - FLAT ROUND, M20 x 44.5 x 3.23, GALV. (50 PACK)	518081	177986	8 or 12
40	WASHER - SQUARE, M20 x 50 x 50 x 6mm (200 PACK)		H39265	6 or 10
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	1
43b	FUSE BASE AND CARRIER LV 630A DUAL CIRCUIT (200 - 400kVA)	31700	90563	1
44	FUSE (REFER NS122 - SECTION 10.2)			
45a	CROSSARM 2100 X 100 X 150	566345	176224	1
45b	CROSSARM 1200 X 100 X 75	15233	71795	1
46	BRACE CROSSARM 740 X 38 X 38 X 5mm (5 PACK)	46	99119	1
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	2
51	BOLT EYE GALV M20 x 200mm	513653	H37881	AS REQ.
52				

53	NUT, EYE M20 GALV.	513951	H38853	3
54	WASHER FLAT GALV M12 x32 x 2.71mm (100 PACK)		177982	9
55	WASHER FLAT GALV M16 x38 x 3.23mm (100 PACK)		177984	14
56	WASHER - CONICAL, M12, STAINLESS STEEL - VOLUTE		179601	4
57	WASHER - CONICAL, M16, STAINLESS STEEL - VOLUTE		146308	7
58	WASHER - SQUARE GALVANISED, M16 x 50 x 50 x 6mm (200 PACK)		H39257	4
59	NUT HEX., M20 GALV. (75 PACK)		175361	1
60	SURGE ARRESTER LV 500V 5KA		H31893	1
61	COVER LV BUSHING		H22032	4
62a	LUG COMPRESSION M12 TO SUIT 95mm² CU CABLE		73304	7
62b	LUG COMPRESSION M12 TO SUIT 35mm² CU CABLE		H20501	6
63	LUG COMP. 2 HOLE (30mm CENTRES) M12 TO SUIT 95mm² CU CABLE		176968	1
64				
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. 228834			
67a	CABLE 95mm² CU PVC INSULATED (REFER TABLE 1 - DWG. 228834)		59584	AS REQ.
67b	CABLE 35mm² CU PVC INSULATED		H13629	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
70	LUG BI-METALLIC COMP. M12 TO SUIT 95mm² CABLE (10 PACK)		58743	1 or 2
71	LUG BI-METALLIC COMPRESSION 2 X M12 TO SUIT 95mm² CABLE		177074	1 or 2
72				
73a	DROPOUT FUSE BASE AND CARRIER 12/24KV TYPE EXPULSION		H84350	2
73b	FUSE BASE, DROPOUT, 12KV, S & C TYPE SMD-20		H70029	2
73c	FUSE BASE, DROPOUT, 24KV, S & C TYPE SMD-20		181441	2
74	CROSSARM 2400 X 100 X 100	566345	176222	1
75	INSULATOR 22KV POLYMERIC LONG-ROD		150375	2
76	CLAMP SUSPENSION LV (30 PACK)		H113472	2
77	PLATE, TWISTED, GALV 150 X 50 x 6mm	151086	176901	2
78	COVER HV BUSHING		H21858	2
79	BOLT & NUT HEX HEAD GALV.M12 X 130mm		46805	1
80	BOLT & NUT HEX HEAD GALV.M16 X 160mm		47043	2
81	SCREW COACH HEX HEAD GALV M12 X 90mm (25 PACK)		50443	1 or 2
82	BOLT HEX HEAD STAINLESS STEEL M16 X 40mm (25 PACK)		H38413	2
83	WASHER - FLAT, M16, 30 x 1.5mm STAINLESS STEEL (100 PACK)		H39621	4
84	NUT NYLOC, M16 STAINLESS STEEL (50 PACK)		177122	2
85	CABLE 11KV 35mm² CU LDPE INSULATED 19/1.53		H114578	AS REQ.
86	LUG KIT HEAVY DUTY TO SUIT 11kV LDPE CABLE (1ø TX SET)		H125252	1
87	LUG COMPRESSION M12 TO SUIT 16mm² 11KV LDPE CABLE		H110270	4
88a	ARRESTERS SURGE 11kV		111948	2
88b	ARRESTERS SURGE 22kV		H32182	2
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	2 or 4
	SEGREGATED EARTHING OPTION			
121	LV SURGE ARRESTER NEUTRAL (SEGREGATED ONLY)		98939	1
122	SEGREGATED EARTHING SIGN	224403	182387	NOTE 8
	COMMUNICATION ARM OPTION			
131a	CROSSARM 1200 X 100 X 75 (LS1)	15233	71795	
131b	CROSSARM 1800 X 150 X 100 (ITEM D)	566345	176225	
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 READ IN CONJUNCTION WITH NS122.
2. DRILL ø22 HOLES FOR CROSSARMS & TRANSFORMER MOUNT SYMMETRICAL TO AXIS OF POLE. DRILL ø14 x 100mm DEEP HOLES FOR POLE STEPS 88° TO AXIS OF POLE AT 450mm & 900mm CENTRES AS SHOWN. BOTTOM POLE STEP TO BE INSTALLED A MINIMUM 3600mm TO A MAXIMUM 4050mm FROM GROUND.
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 BIMETALLIC 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 ARM MUST BE INCREASED TO 1200mm WHERE HOT LINE CLAMPS ARE USED. THE DISTANCE BETWEEN HV FEEDER & HV DROP-OUT FUSE ARM MAY BE INCREASED TO A MAXIMUM OF 1500mm FOR INCREASED HV FEEDER CLEARANCE OR TO ALLOW FOR SAFE WORKING CLEARANCE TO HV WHERE HOT LINE CLAMPS ARE USED. WHERE A DISTANCE GREATER THAN 1500mm IS REQUIRED, A SUPPORT CROSSARM WITH HORIZONTAL PIN ISOLATORS MUST BE INSTALLED MIDWAY BETWEEN HV FEEDER AND HV DROP-OUT FUSE ARM.
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.228834.
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 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 ON THE NON CLIMBING SIDE, OPPOSITE TO THE ROADWAY. LV UGOH CABLES MUST NOT EXCEED 50mm². LV UGOH CABLE INSTALLATION AND MAXIMUM NUMBER PERMITTED IS DETAILED IN NS127 AND NS122.
11. ALL 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 3 OPTIONAL CROSSARM SIZES THAT CAN BE USED DEPENDING ON LOCATION OF EXISTING CABLE AND STANDOFF THAT IS REQUIRED. CABLE TO BE NOT LESS THAN 4,900mm ABOVE GROUND LEVEL BETWEEN POLES. THE COMMUNICATIONS CABLE CATENERY 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 PROPERTY SIDE OF POLE.
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. ENSURE ALL GROUND CLEARANCES DETAILED IN NS220 ARE MAINTAINED.

REFERENCE DRAWINGS	DWG. NO.
POLE TRANSFORMER - SINGLE PHASE - EARTHING CONNECTION DETAILS	228832
POLE TRANSFORMER - SINGLE PHASE - CROSSARM DETAILS	228833
POLE TRANSFORMER - SINGLE PHASE - LV CONNECTIONS	228834
POLE TRANSFORMER - SINGLE PHASE - HV OVERHEAD SUPPLY OPTIONS	228835
POLE TRANSFORMER - SINGLE PHASE - STREET LIGHTING DETAIL OPTION	228836

CAD DRAWING DO NOT MANUALLY AMEND

AMENDMENTS

1. ITEM 88 AMENDED TO INCLUDE 22kV ARRESTOR MINIMUM CLEARANCE TO CROSSARM AMENDED NOTE 13 ADDED ITEM 131c DELETED

P/N PM02-02013-0-0-0010
DATE: 04-06-2013
DRAWN: C.MABBUTT
DESIGNED: D.GRISEV
APPROVED: P.JARVIS

CONSTRUCTION

NETWORK STANDARD
Ausgrid
DISTRIBUTION OPERATIONS & RELIABILITY
LOGISTICS AND DISTRIBUTION ENGINEERING
25-27 POMEROY STREET, HOMEBUSH

SCALE	AS SHOWN
DESIGNED	
DRAWN	C.MABBUTT
CHECKED	P.JARVIS
APPROVED	D.GRISEV
DATE	15/10/2012
PROJECT NUMBER	PM02-02010-1-3-1
PROJTRAK NUMBER	

STANDARD CONSTRUCTION
SINGLE PHASE - 11/22kV POLE MOUNTED DISTRIBUTION SUBSTATION
0 - 63kVA
GENERAL ARRANGEMENT

SIZE	DRAWING No	SHEET	AMD
B1	228831	1	1

©