



REFERENCE DRAWINGS		
11kV POLE MOUNTED VOLTAGE REGULATOR CONTROLLING INTELLI-DROPPER	224228	
11kV POLE MOUNTED VOLTAGE REGULATOR WITH CONTROLLING INTELLI-DROPPER	224227	
EATON COOPER POWER SYSTEMS V332 200A POLE MOUNTED REGULATOR MOUNTING FRAME	191217	
11kV POLE MOUNTED VOLTAGE REGULATOR GROUND MOUNTED FIBREGLASS CABINET CONCRETE FOOTING DETAILS	191227	
11kV POLE MOUNTED VOLTAGE REGULATOR TIMBER CROSSARM DRILLING DETAIL	224230	

EQUIPMENT WEIGHTS		
EATON COOPER POWER SYSTEMS V332 200A REGULATOR (PER UNIT)		1500kg

ITEM	DESCRIPTION	DWG NO	STOCK CODE	QTY
106	CCT EARTHING POINT COVER (SEE NOTE 16)		144741	3
105	HEATSHRINK TERMINATION KIT FOR HV DROPPER LUGS		152207	1
104	ANTENNA (WHERE REQUIRED) FOR COMMS INSTALL		1	1
103	COMMUNICATIONS COAXIAL CABLE (WHERE REQUIRED FOR COMMS INSTALL)		AS REQ.	
102	NUT - M20, HEX, GALV.		515466	175361
101	WASHER - SPRING, M20, GALV.		515467	175569
100	NUT - M16, HEX, STAINLESS STEEL		515467	175921
99	WASHER - BEVELLE, M16, STAINLESS STEEL		515467	177296
98	WASHER - FLAT ROUND, M16, STAINLESS STEEL		515467	177984
97	SET SCREW - M10 x 30, HEX, STAINLESS STEEL		515467	150888
96	NUT - M12, HEX, STAINLESS STEEL		515467	8987
95	WASHER - BEVELLE, M12, STAINLESS STEEL		515467	175903
94	WASHER - FLAT ROUND, M12, STAINLESS STEEL		515467	177984
93	SET SCREW - M12 LENGTH TO SUIT, HEX, STAINLESS STEEL		515467	177122
92	NUT - M16, HEX, NYLON, STAINLESS STEEL		515467	179756
91	NUT - M16, HEX, STAINLESS STEEL		515467	157487
90	WASHER - BEVELLE, M16, STAINLESS STEEL		515467	179921
89	WASHER - FLAT ROUND, M16, STAINLESS STEEL		515467	177984
88	SET SCREW - M16 x 40, HEX, STAINLESS STEEL		515467	177984
87	WASHER - FLAT ROUND, M16, GALV.		515467	177984
86	WASHER - CONICAL, M16, GALV.		515467	179921
85	BOLT & NUT - M12 x 140, HEX, GALV.		515466	14821
84	BOLT & NUT - M12 x 180, HEX, GALV.		515466	14888
83	WASHER - FLAT ROUND, M12, GALV.		515467	177984
82	WASHER - CONICAL, M12, GALV.		515467	179921
81	WASHER - SQUARE, M16, 50x50, GALV.		515467	179921
80	U-BOLT - M16, SIZE TO SUIT POLE, c/w 4 NUTS & WASHERS, GALV.		514409	4
79	BOLT & NUT - M16 x 200, c/w 2 HEX NUTS, GALV.		515466	83725
78	EYEBOLT - M20, GALV.		515467	179921
77	WASHER - FLAT ROUND, M20, GALV.		515467	177984
76	WASHER - CONICAL, M20, GALV.		515467	179921
75	WASHER - SQUARE, M20, 75x75, GALV.		515467	179921
74	EYEBOLT - M20 x 200, c/w 2 HEX NUTS, GALV.		515466	83725
73	BOLT & NUT - M20 x LENGTH TO SUIT POLE, HEX, GALV.		515466	179921
72	WASHER - SPRING, M24, GALV. AS1111		515466	179921
71	WASHER - FLAT ROUND, M24, GALV.		515467	179921
70	WASHER - CONICAL, M24, GALV.		515467	179921
69	WASHER - FLAT ROUND, M24, GALV.		515467	179921
68	WASHER - CONICAL, M24, GALV.		515467	179921
67	WASHER - FLAT ROUND, M24, GALV.		515467	179921
66	BOLT & NUT - M24 x 65, HEX, GALV. AS1111		515466	179921
65	BOLT & NUT - M24 x 90, HEX, GALV. AS1111		515466	179921
64	BOLT & NUT - M24 x LENGTH TO SUIT POLE, HEX, GALV.		515466	179921
63	COACH SCREW - M6 x 40, HEX, GALV.		50591	5
62	COACH SCREW - M12 x 100, HEX, GALV.		50591	5
61	CLOUT - 82.3 x 40, GALV.		50963	AS REQ.
60	CHARACTER TAGS - 50mm ALUMINIUM, BLACK ON YELLOW		PURCHASE	AS REQ.
59	SIGN - "DANGER HIGH VOLTAGE"		503117	HL7012
58	BEND - 100mm HIGH IMPACT ABS (ABScon)		PURCHASE	1
57	SADDLE - TO SUIT CABLE		PURCHASE	AS REQ.
56	SADDLE - 40mm, FULL, GALV.		PURCHASE	AS REQ.
55	SADDLE - 100mm, FULL, GALV.		PURCHASE	AS REQ.
54	CONDUIT - 40mm HIGH IMPACT ABS (ABScon)		PURCHASE	AS REQ.
53	CONDUIT - 40mm HEAVY DUTY ORANGE (BELOW GROUND ONLY)		PURCHASE	AS REQ.
52	CONDUIT - 100mm HIGH IMPACT ABS (ABScon)		PURCHASE	AS REQ.
51	CONDUIT - 100mm HEAVY DUTY ORANGE (BELOW GROUND ONLY)		PURCHASE	AS REQ.
50	COVER - UNDERGROUND CABLE PROTECTION, 150mm WIDE		151084	AS REQ.
49	COVERGUARD - PVC, HIGH IMPACT, BLACK		205775	151552
48	CONTROL CABLE - 12 CORE, 18m, EXTENSION		181674	2
47	CONDUCTOR - 35mm <sup>2</sup> 17kV/53 Cu, LDPE INSULATED, PVC SHEATHED		HL4578	AS REQ.
46	COVERED CONDUCTOR THICK - CCT141 (17kV-75)		147421	AS REQ.
45	CONDUCTOR - SINGLE CORE OF 95mm <sup>2</sup> ABC (SEE DGS18)		67959	AS REQ.
44	CONDUCTOR - 19/2.14 BLACK PVC INSULATED HD (70mm <sup>2</sup> EARTH)		60111	AS REQ.
43	COVER - FOR CCT PARALLEL GROOVE CLAMP		144576	3
42	CLAMP - PARALLEL GROOVE, 2 BOLT, TO SUIT CCT		144568	3
41	CLAMP - PARALLEL GROOVE, TO SUIT FEEDER CONDUCTOR & CCT		514999	AS REQ.
40	CLAMP - PARALLEL GROOVE, 2 BOLT, COPPER		176946	2
39	LUG KIT - FOR 35mm <sup>2</sup> Cu LDPE INSULATED PVC SHEATHED CONDUCTOR		HL25260	1
38	LUG - COMPRESSION, TINNED Cu, M12, FOR 35mm <sup>2</sup> Cu CONDUCTOR		SEE ITEM 38	3
37	LUG - COMPRESSION, TINNED Cu, M12, FOR 35mm <sup>2</sup> Cu CONDUCTOR		SEE ITEM 38	3
36	LUG - COMPRESSION, B-METALLIC, 2xM10 HOLES, FOR CCT120		176472	12
35	LUG - COMPRESSION, B-METALLIC, 2xM10 HOLES, FOR CCT120		176472	12
34	LUG - COMPRESSION, TINNED Cu, M16, FOR 70mm <sup>2</sup> Cu CONDUCTOR		51877	2
33	LUG - COMPRESSION, B-METALLIC, M12, FOR 95mm <sup>2</sup> AL CONDUCTOR		58743	3
32	LUG - COMPRESSION, TINNED Cu, M12, FOR 70mm <sup>2</sup> Cu CONDUCTOR		17431	19
31	LINK - COMPRESSION, B-METALLIC, 95mm <sup>2</sup> AL TO 70mm <sup>2</sup> Cu		HL07771	1
30	CONNECTOR - Cu, COMPRESSION, 70mm <sup>2</sup> CONDUCTOR TO Ø15 ROD		HL3659	AS REQ.
29	COUPLING SLEEVE - TO SUIT Ø15 EARTH RODS		HL1649	AS REQ.
28	EARTH ROD - 800 x Ø15 COPPERCLAD STEEL CORED		HL1649	AS REQ.
27	EARTH STUB - MCKEEDWN		520088	110845
26	EARTH BAR - TINNED COPPER, FLAT, 50.8x6.3		222406	18210
25	SURGE ARRESTER - 1kV, 10kA, POLYIMIDIC DISTRIBUTION TYPE		119448	3
24	ISOLATING LINK - SINGLE PHASE, 12kV, 630A		58750	3
23	HANGER - CABLE CLAMP, SUSPENSION		HL13472	3
22	LINK PLATE - TWISTED, 170x50x6, GALV.		151086	176901
21	THE WIRE - PREFORMED, INSULATED FOR CCT120		144600	8
20	SAG LINK - 70x4 (D.F. PART NO. CTSEW-070-1)		PURCHASE	3
19	COVER - FOR STRAIN CLAMP		144543	3
18	STRAIN CLAMP - FOR CCT120		144527	3
17	INSULATOR - STRAIN, FOR 11kV CCT		144550	3
16	INSULATOR - M16 x 145 STUD, FOR 11kV CCT		145052	8
15	INSULATOR - 23V LONGROD		150375	3
14	REGULATOR CONTROLLER - (SUPPLIED WITH REGULATOR)			2
13				
12	CROSSARM - WOOD, 120x75x100		224230	2
11	REGULATOR UNIT - EATON COOPER POWER SYSTEMS V332, 200AMP		176619	2
10	REGULATOR MOUNTING FRAME		181618	FABRICATE
9	BRACE - 60x60x5 FLAT BAR, FOR CROSSARM		516385	10
8	STANDARD EARTHING POINTS AND COVERS ARE TO BE INSTALLED ON THE CCT CABLE USED FOR REGULATOR SUPPLY (ITEM 44). THESE ARE NORMALLY LOCATED AT THE INTERRUPTER POLE. HOWEVER IF THE INTERRUPTER POLE IS NOT WITHIN LINE OF SIGHT OF THE REGULATOR POLE, STANDARD EARTHING POINTS AND COVERS ARE TO BE INSTALLED ON BOTH ENDS OF THE CCT CABLE.		146290	10
7	GAIN BLOCK - 100mm, ALUMINIUM		146274	6
6	CROSSARM 3 - WOOD, 2700x150x100		224230	H23761
5	CROSSARM 2 - WOOD, 2700x150x100		224230	H23761
4	CROSSARM 1 - WOOD, 2700x150x100		224230	H23761
3	11kV CCT THROUGH TERMINATION (2-11CCT)		174962	1
2	POLE - WOOD, MIN 155x124x11, CONCRETED MIN 2.8m IN GROUND		151915	1
1				

GROUND MOUNTED CONTROL UNITS SHALL BE USED WHERE THE CONTROL UNIT HOUSING IS NOT LIKELY TO BE ADVERSELY AFFECTED. ADVERSE AFFECTS INCLUDE POTENTIAL INTERFERENCE BY LIVESTOCK OR INSTALLATION IN FLOOD PRONE SITES. IN SUCH SITES, POLE MOUNTED CONTROL UNITS MAY BE USED.

- NOTES**
- MINIMUM CLEARANCES - PHASE TO EARTH TO BE GREATER THAN 200mm
  - REGULATOR CONTROL CABINETS TO BE MOUNTED 4000mm FROM GROUND
  - REFER TO DRAWING 224230 FOR REGULATOR CONTROLLER CROSSARM DRILLING DETAILS
  - WHERE CCT MANS ARE USED, STANDARD EARTHING POINTS & COVERS ARE TO BE INSTALLED AS DETAILED IN NS120
  - ALL HV CONNECTIONS (EXCEPT CONNECTIONS TO THE ARRESTERS) ARE TO BE MADE USING 7x1.75 10mm<sup>2</sup> COVERED CONDUCTOR THICK (CCT120). WHERE THE CONDUCTOR IS REQUIRED TO BE STRIPPED PRIOR TO TERMINATION, THE ENTIRE STRIPPED LENGTH MUST BE CLEANED & WIRE BRUSHED VIGOROUSLY & SUITABLE JOINTING COMPOUND APPLIED TO IT IMMEDIATELY
  - THE HV CONNECTIONS TO THE ARRESTERS ARE TO BE MADE USING 35mm<sup>2</sup> COVERED COPPER CONDUCTOR (ITEM 47) AND SHALL HAVE HV STABILIZED MASTER LINED LV HEATSHRINK TUBING SHRUNK OVER THE BARREL OF THE LUGS AND THE CABLE ENDS.
  - HV SURGE ARRESTERS ARE TO BE EARTHED BY DAISY CHAINING AND ELECTRICALLY BONDED TO TOP EARTH BAR USING 70mm<sup>2</sup> COPPER EARTH CONDUCTORS WILL BE EXTENDED VIA BI-METALLIC LINKS TO THE EARTH ELECTRODES. REFER TO DGS84 FOR FURTHER DETAILS.
  - 95mm<sup>2</sup> ALUMINIUM EARTH CONDUCTOR SHALL BE USED FROM THE BOTTOM EARTH BAR TO 300mm ABOVE GROUND WHERE 70mm<sup>2</sup> COPPER EARTH CONDUCTORS WILL BE EXTENDED VIA BI-METALLIC LINKS TO THE EARTH ELECTRODES. REFER TO DGS84 FOR FURTHER DETAILS.
  - REGULATOR (ASSET) NUMBER TO BE INSTALLED ON POLE APPROXIMATELY 3600mm ABOVE GROUND. LEAD LINK NUMBER TO BE INSTALLED IN ACCORDANCE WITH NS18 TABLE 4 - HV & LV LINK SET NUMBER LABELS (APPROXIMATELY 3000mm ABOVE GROUND). THE POLE NUMBER SHALL BE INSTALLED IN ACCORDANCE WITH NS18 (BETWEEN 2400mm & 3000mm ABOVE GROUND).
  - PHASE LINK LABELS TO BE INSTALLED ADJACENT TO EACH LINK AS SHOWN USING MINIMUM 50mm ALUMINIUM BLACK ON YELLOW CHARACTER TAGS.
  - DANGER SIGNS TO BE INSTALLED ON BOTH FRONT & REAR OF POLE. SIGNS MUST BE BENT AROUND POLE BEFORE SECURING.
  - A POLE MOUNTED EXTERNAL ANTENNA CAN BE INSTALLED WHERE REQUIRED. THE ACTUAL LOCATION OF THE ANTENNA ON THE POLE IS TO BE DETERMINED DURING INSTALLATION OF COMMUNICATION EQUIPMENT. THE LOCATION IS ALWAYS TO COMPLY WITH THE MINIMUM SAFE WORKING DISTANCES SPECIFIED IN AUSTRALIAN ELECTRICAL SAFETY RULES.
  - DRAW WIRE TO BE INSTALLED INSIDE Ø40 CONDUIT FOR FUTURE COMMS COAXIAL CABLE. SECURE DRAW WIRE AND SEAL END OF CONDUIT WITH SUITABLE PVC TAPE. ALL STEELWORK IS TO BE SECURELY BONDED TO EARTH USING 70mm<sup>2</sup> BLACK PVC INSULATED CABLE.
  - INSTALL MEDIUM WALLED MASTIC LINED BLACK HEATSHRINK OVER THE BARE LUG BARREL AND CABLE INSULATION.
  - STANDARD EARTHING POINTS AND COVERS ARE TO BE INSTALLED ON THE CCT CABLE USED FOR REGULATOR SUPPLY (ITEM 44). THESE ARE NORMALLY LOCATED AT THE INTERRUPTER POLE. HOWEVER IF THE INTERRUPTER POLE IS NOT WITHIN LINE OF SIGHT OF THE REGULATOR POLE, STANDARD EARTHING POINTS AND COVERS ARE TO BE INSTALLED ON BOTH ENDS OF THE CCT CABLE.

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

ITEM	DESCRIPTION	DWG NO	STOCK CODE	QTY
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

CONSTRUCTION



SCALE	AS SHOWN	DESCRIPTION	DWG NO	STOCK CODE	QTY
SCALE	AS SHOWN				
DESIGNED	C.MABUITT				
DRAWN	P.JARVIS				
CHECKED	D.GRICEY				
APPROVED	03/11/2011				
DATE					
PROJECT NUMBER	PM02-02010-1-3-1				
PROJECT TRACK NUMBER					
SIZE	A0				
DRAWING NO	224402				
SHEET	1				
AND	5				