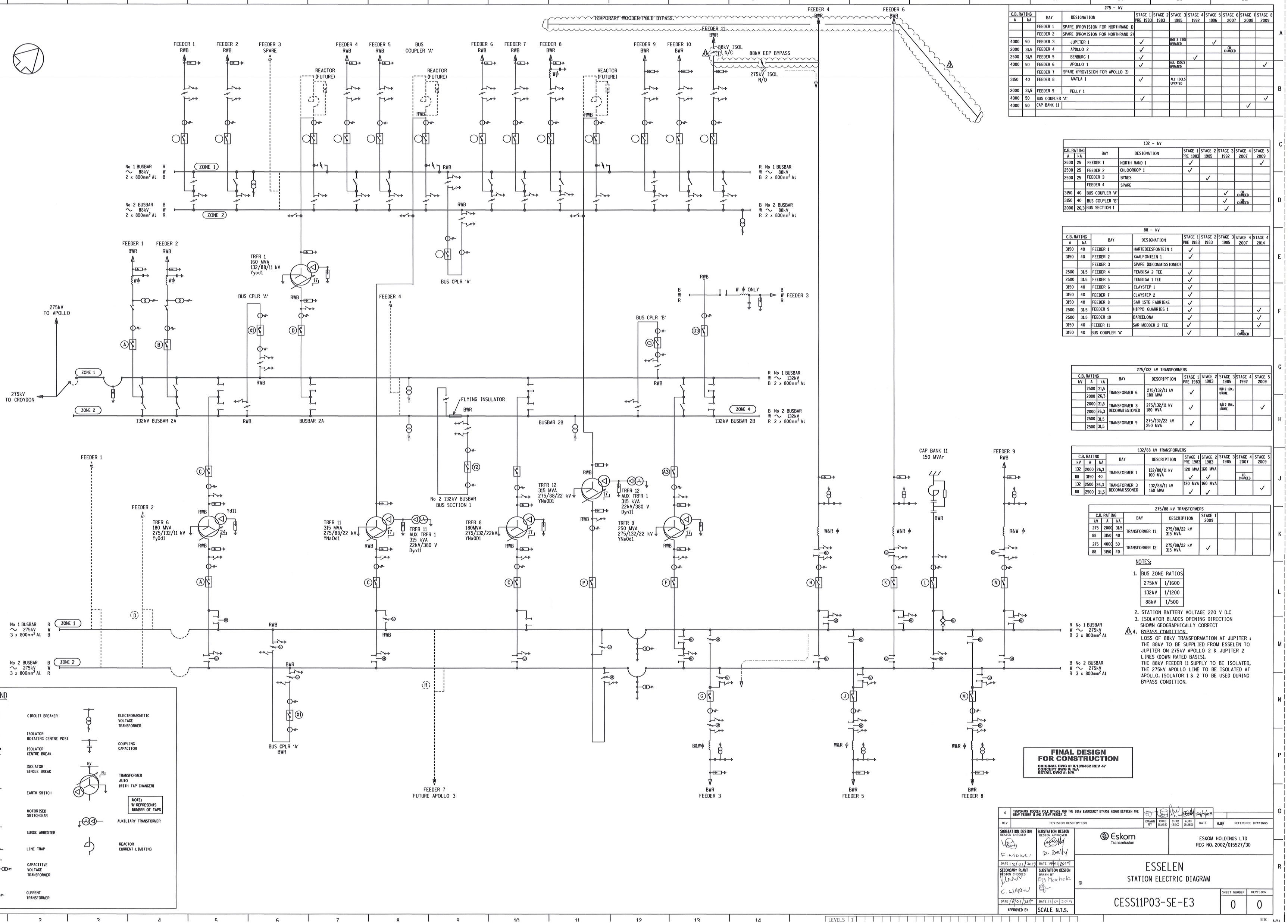

275 - kV										
C.B. RATING A	C.B. RATING kA	BAY	DESIGNATION	STAGE 1 PRE 1983	STAGE 2 1983	STAGE 3 1985	STAGE 4 1992	STAGE 5 1996	STAGE 6 2007	STAGE 7 2008	STAGE 8 2009
		FEEDER 1	SPARE (PROVISION FOR NORTHRAND 1)								
		FEEDER 2	SPARE (PROVISION FOR NORTHRAND 2)								
4000	50	FEEDER 3	JUPITER 1	✓		R/B 2 ISOL UPRATED		✓			
2000	31,5	FEEDER 4	APOLLO 2	✓					CB CHANGED		
2500	31,5	FEEDER 5	BENBURG 1	✓			✓				
4000	50	FEEDER 6	APOLLO 1	✓		ALL ISOLS UPRATED					✓
		FEEDER 7	SPARE (PROVISION FOR APOLLO 3)								
3150	40	FEEDER 8	MATLA 1	✓		ALL ISOLS UPRATED					
2000	31,5	FEEDER 9	PELLY 1								
4000	50	BUS COUPLER 'A'		✓							✓
4000	50	CAP BANK 11								✓	

132 - kV								
C.B. RATING A	C.B. RATING kA	BAY	DESIGNATION	STAGE 1 PRE 1983	STAGE 2 1985	STAGE 3 1992	STAGE 4 2007	STAGE 5 2009
2500	25	FEEDER 1	NORTH RAND 1	✓				✓
2500	25	FEEDER 2	CHLOORKOP 1	✓				
2500	25	FEEDER 3	BYNES		✓			
		FEEDER 4	SPARE					
3150	40	BUS COUPLER 'A'				✓	CB CHANGED	
3150	40	BUS COUPLER 'B'				✓	CB CHANGED	
2000	26,3	BUS SECTION 1				✓		

88 - kV								
C.B. RATING A	C.B. RATING kA	BAY	DESIGNATION	STAGE 1 PRE 1983	STAGE 2 1983	STAGE 3 1985	STAGE 4 2007	STAGE 4 2014
3150	40	FEEDER 1	HARTEBEESFONTEIN 1	✓				
3150	40	FEEDER 2	KAALFONTEIN 1	✓				
		FEEDER 3	SPARE (DECOMMISSIONED)					
2500	31,5	FEEDER 4	TEMBISA 2 TEE	✓				
2500	31,5	FEEDER 5	TEMBISA 1 TEE	✓				
3150	40	FEEDER 6	CLAYSTEP 1	✓				
3150	40	FEEDER 7	CLAYSTEP 2	✓				
3150	40	FEEDER 8	SAR ISTE FABRIEKE	✓				
2500	31,5	FEEDER 9	HIPPO QUARRIES 1	✓				✓
2500	31,5	FEEDER 10	BARCELONA	✓				✓
3150	40	FEEDER 11	SAR MODDER 2 TEE	✓				✓
3150	40	BUS COUPLER 'A'		✓			CB CHANGED	

275/132 kV TRANSFORMERS									
C.B. RATING kV	C.B. RATING A	C.B. RATING kA	BAY	DESCRIPTION	STAGE 1 PRE 1983	STAGE 2 1983	STAGE 3 1985	STAGE 4 1992	STAGE 5 2009
	2500	31,5	TRANSFORMER 6	275/132/11 kV 180 MVA	✓		R/B 2 ISOL. UPRATE		
	2000	26,3							
	2000	31,5	TRANSFORMER 8 DECOMMISSIONED	275/132/11 kV 180 MVA	✓		R/B 2 ISOL. UPRATE		✓
	2000	26,3							
	2500	31,5	TRANSFORMER 9	275/132/22 kV 250 MVA	✓				
	2500	31,5							

132/88 kV TRANSFORMERS										
C.B. RATING kV	C.B. RATING A	C.B. RATING kA	BAY	DESCRIPTION	STAGE 1 PRE 1983	STAGE 2 1983	STAGE 3 1985	STAGE 4 2007	STAGE 5 2009
132	2000	26,3	TRANSFORMER 1	132/88/11 kV 160 MVA	120 MVA ✓	160 MVA ✓		CB CHANGED	
88	3150	40							
132	2500	26,3	TRANSFORMER 3 DECOMMISSONED	132/88/11 kV 160 MVA	120 MVA ✓	160 MVA ✓			✓
88	2500	31,5							

275/88 kV TRANSFORMERS							
C.B. RATING kV	C.B. RATING A	C.B. RATING kA	BAY	DESCRIPTION	STAGE 1 2009		
275	2000	31,5	TRANSFORMER 11	275/88/22 kV 315 MVA			
88	3150	40					
275	4000	50	TRANSFORMER 12	275/88/22 kV 315 MVA	✓		
88	3150	40					

NOTES:

1.

BUS ZONE RATIOS	
275kV	1/1600
132kV	1/1200
88kV	1/500

2. STATION BATTERY VOLTAGE 220 V D.C
3. ISOLATOR BLADES OPENING DIRECTION SHOWN GEOGRAPHICALLY CORRECT
4. BYPASS CONDITION
LOSS OF 88kV TRANSFORMATION AT JUPITER : THE 88kV TO BE SUPPLIED FROM ESSELEN TO JUPITER ON 275kV APOLLO 2 & JUPITER 2 LINES (DOWN RATED BASIS). THE 88kV FEEDER 11 SUPPLY TO BE ISOLATED, THE 275kV APOLLO LINE TO BE ISOLATED AT APOLLO. ISOLATOR 1 & 2 TO BE USED DURING BYPASS CONDITION.

FINAL DESIGN FOR CONSTRUCTION
ORIGINAL DWG #: 0.18/6462 REV 47
CONCEPT DWG #: N/A
DETAIL DWG #: N/A

LEGEND

- CIRCUIT BREAKER
- ISOLATOR ROTATING CENTRE POST
- ISOLATOR CENTRE BREAK
- ISOLATOR SINGLE BREAK
- EARTH SWITCH
- MOTORISED SWITCHGEAR
- SURGE ARRESTER
- LINE TRAP
- CAPACITIVE VOLTAGE TRANSFORMER
- CURRENT TRANSFORMER
- ELECTROMAGNETIC VOLTAGE TRANSFORMER
- COUPLING CAPACITOR
- TRANSFORMER AUTO (WITH TAP CHANGER)
  NOTE: 'N' REPRESENTS NUMBER OF TAPS
- AUXILIARY TRANSFORMER
- REACTOR CURRENT LIMITING

REV	REVISION DESCRIPTION	DRAWN BY	CHKD (SUBS)	CHKD (SECT)	AUTH (SUBS)	DATE	REFERENCE DRAWINGS
0	TEMPORARY WOODEN POLE BYPASS AND THE 88kV EMERGENCY BYPASS ADDED BETWEEN THE 88kV FEEDER 11 AND 275kV FEEDER 3.					24/10/2011	0.18/

SUBSTATION DESIGN DESIGN CHECKED F. MOLINS DATE 15/01/2012	SUBSTATION DESIGN DESIGN APPROVED D. Delly DATE 19/01/2012	Eskom Transmission — ESKOM HOLDINGS LTD REG NO. 2002/015527/30
SECONDARY PLANT DESIGN CHECKED C. WARREN DATE 18/01/2012	SUBSTATION DESIGN DRAWN BY P.D. Mokhele DATE 13/01/2012	ESSELEN STATION ELECTRIC DIAGRAM
APPROVED BY	SCALE N.T.S.	CESS11P03-SE-E3 — SHEET NUMBER 0 — REVISION 0

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