

MOKOLO ABSTRACTION WEIR COST MODEL		
No	DESCRIPTION	AMOUNT (Rand)
1	Mokolo Works	
	a) Abstraction Weir	138 328 043
	b) Siltation Works	15 034 682
	c) Balancing Dam	18 385 432
	SUB-TOTAL BOSCHKOP	171 748 157

ABSTRACTION WEIR COST MODEL						
Mokolo Weir						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	1.0	27 664
2	2.0	River diversion	Sum	1 725 000	1.0	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	13 513	540 520
	3.1.2	(ii) extra over for rock	m ³	71	1 351	95 942
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	-	-
	3.2.2	(ii) extra over for rock	m ³	99	-	-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	7 364	147 280
	4.2	b) extra over for rock	m ²	20	736	14 728
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	8 700	38 019 000
				-		
6	6.0	Embankment		-		
	6.1	(a) Earthfill	m ³	47	3 150	148 050
	6.2	(b) Filters	m ³	174	551	95 918
	6.3	(c) Rip-rap	m ³	95	4 803	456 285
	6.4	(d) Geofabric	m ²	30	3 694	110 820
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	6 793	1 745 801
	7.1.2	(ii) Intricate	m ²	316	509	160 994
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	4 805	5 554 580
	7.2.2	(ii) Structural	m ³	1 482	1 054	1 562 028
	7.3	(c) Reinforcing	t	12 350	58	715 930
		SUB-TOTAL				51 137 137

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	2 434 000	1	2 434 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	5	98 800
9	9.0	Fencing	km	27 664	1.8	51 138
10	10.0	Landscaping (% of 1-9)	%	5		2 556 857
11	11.0	Miscellaneous (% of 1-9)	%	10		5 113 714
		SUB TOTAL A				61 991 646
12	12.0	Preliminary & General (% of sub-total A)	%	30		18 597 494
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.5	175 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accomodation	Sum	-	1	-
		SUB TOTAL B				81 164 139
15	15.0	Contingencies	%	30		24 349 242
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				105 513 381
16	16.0	Planning design & supervision	%	15		15 827 007
		(% of sub-total C)				
		SUB TOTAL D				121 340 388
17	17.0	VAT				
		(% of sub-total D)	%	14		16 987 654
		NETT PROJECT COST				138 328 043
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				138 328 043

ABSTRACTION WEIR COST MODEL						
Mokolo De-Silting Works						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	1.0	27 664
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	1 132	45 282
	2.1.2	(ii) extra over for rock	m ³	71	679	48 225
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59	-	-
	2.2.2	(ii) extra over for rock	m ³	99	-	-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	4 400	88 000
	4.2	b) extra over for rock	m ²	20	2 640	52 800
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	11 321	532 064
	6.2	(b) Filters	m ³	174		-
	6.3	(c) Rip-rap	m ³	95	102	9 679
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	2 132	547 924
	7.1.2	(ii) Intricate	m ²	316	320	101 057
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	73	84 446
	7.2.2	(ii) Structural	m ³	1 482	974	1 443 468
	7.3	(c) Reinforcing	t	12 350	54	661 590
		SUB-TOTAL				3 658 796

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Gates	Sum	1 656 000	1	1 656 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	10	197 600
9	9.0	Fencing	km	27 664	1.2	34 539
10	10.0	Landscaping (% of 1-9)	%	5		182 940
11	11.0	Miscellaneous (% of 1-9)	%	10		365 880
		SUB TOTAL A				6 695 755
12	12.0	Preliminary & General (% of sub-total A)	%	30		2 008 727
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				9 174 482
15	15.0	Contingencies	%	25		2 293 620
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				11 468 102
16	16.0	Planning design & supervision	%	15		1 720 215
		(% of sub-total C)				
		SUB TOTAL D				13 188 317
17	17.0	VAT				
		(% of sub-total D)	%	14		1 846 364
		NETT PROJECT COST				15 034 682
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				15 034 682

ABSTRACTION WEIR COST MODEL						
Mokolo Balancing Dam						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	3.0	82 992
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	12 269	490 763
	2.1.2	(ii) extra over for rock	m ³	71	7 361	522 662
				-		
	2.2	(b) Confined		-		
	2.2.1	(i) all materials	m ³	59	1 840	108 581
	2.2.2	(ii) extra over for rock	m ³	99	1 104	109 317
				-		
4	4.0	Preparation of solum		-		
	4.1	a) all materials	m ²	20	11 400	228 000
	4.2	b) extra over for rock	m ²	20	6 840	136 800
				-		
5	5.0	Drilling & Grouting		-		
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
				-		
6	6.0	Embankment		-		
	6.1	(a) Earthfill	m ³	47	8 700	408 900
	6.2	(b) Filters	m ³	174	1 523	264 915
	6.3	(c) Rip-rap	m ³	95	1 104	104 900
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
	6.5	(e) Waterproof Membrane System	m ²	100	8 100	810 000
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	503	129 271
	7.1.2	(ii) Intricate	m ²	316	50	15 895
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	102	117 912
	7.2.2	(ii) Structural	m ³	1 482	196	290 472
	7.3	(c) Reinforcing	t	12 350	11	133 133
		SUB-TOTAL				3 971 111

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Screens	Sum	2 939 000	1	2 939 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	6	118 560
				-		
9	9.0	Fencing	km	27 664	1.6	44 262
10	10.0	Landscaping (% of 1-9)	%	5		198 556
11	11.0	Miscellaneous (% of 1-9)	%	10		397 111
		SUB TOTAL A				8 268 601
12	12.0	Preliminary & General (% of sub-total A)	%	30		2 480 580
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				11 219 181
15	15.0	Contingencies	%	25		2 804 795
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				14 023 976
16	16.0	Planning design & supervision	%	15		2 103 596
		(% of sub-total C)				
		SUB TOTAL D				16 127 572
17	17.0	VAT				
		(% of sub-total D)	%	14		2 257 860
		NETT PROJECT COST				18 385 432
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				18 385 432

ABSTRACTION WEIR COST MODEL		
No	DESCRIPTION	AMOUNT (Rand)
1	7 Separate Dams	
	a) Balancing Dam	1 569 409 293
	SUB-TOTAL for 7 Balancing Dams	1 569 409 293
1	1 Large Dam	
	a) Balancing Dam	1 135 743 944
	SUB-TOTAL for one Large Dam	1 135 743 944

ABSTRACTION WEIR COST MODEL						
Dams						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	39	217 326
	1.2	b) Bush	ha	16 598	65	1 086 564
	1.3	c) Trees	ha	27 664	157	4 346 360
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	320 095	12 803 800
	2.1.2	(ii) extra over for rock	m ³	71	80 024	5 681 686
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59	14 000	826 000
	2.2.2	(ii) extra over for rock	m ³	99	12 600	1 247 400
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	2 618 541	52 370 826
	4.2	b) extra over for rock	m ²	20	654 635	13 092 706
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443		-
	5.2	(b) Consolidation grouting	m drill	443		-
	5.3	(c) Jet grouting	m drill	4 370		-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	3 200 950	150 444 651
	6.2	(b) Filters	m ³	174	285 416	49 662 362
	6.3	(c) Rip-rap	m ³	95	570 832	54 229 016
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	570 832	2 283 327
	6.5	(e) Waterproof Membrane System	m ²	100	1 902 773	190 277 250
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	1 627	418 023
	7.1.2	(ii) Intricate	m ²	316	122	38 549
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	214	247 825
	7.2.2	(ii) Structural	m ³	1 482	1 429	2 118 092
	7.3	(c) Reinforcing	t	12 350	107	1 323 808
		SUB-TOTAL				542 715 572

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Gates	Sum	141 540 000	1	141 540 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	21	414 960
				-		
9	9.0	Fencing	km	27 664	4.4	122 476
10	10.0	Landscaping (% of 1-9)	%	5		27 135 779
11	11.0	Miscellaneous (% of 1-9)	%	10		54 271 557
		SUB TOTAL A				766 800 345
12	12.0	Preliminary & General (% of sub-total A)	%	30		230 040 103
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.0	350 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				997 590 448
15	15.0	Contingencies	%	20		199 518 090
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				1 197 108 538
16	16.0	Planning design & supervision	%	15		179 566 281
		(% of sub-total C)				
		SUB TOTAL D				1 376 674 818
17	17.0	VAT				
		(% of sub-total D)	%	14		192 734 475
		NETT PROJECT COST				1 569 409 293
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				1 569 409 293

ABSTRACTION WEIR COST MODEL						
1 Large Balancing Dam						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	32	176 675
	1.2	b) Bush	ha	16 598	53	883 320
	1.3	c) Trees	ha	27 664	128	3 533 364
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	257 197	10 287 889
	2.1.2	(ii) extra over for rock	m ³	71	64 299	4 565 251
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59	4 250	250 750
	2.2.2	(ii) extra over for rock	m ³	99	4 250	420 750
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	2 128 738	42 574 756
	4.2	b) extra over for rock	m ²	20	532 184	10 643 689
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443		-
	5.2	(b) Consolidation grouting	m drill	443		-
	5.3	(c) Jet grouting	m drill	4 370		-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	2 571 972	120 882 691
	6.2	(b) Filters	m ³	174	226 150	39 350 148
	6.3	(c) Rip-rap	m ³	95	452 301	42 968 552
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	452 301	1 809 202
	6.5	(e) Waterproof Membrane	m ²	100	1 507 669	150 766 850
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	1 436	368 979
	7.1.2	(ii) Intricate	m ²	316	108	34 026
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	151	174 267
	7.2.2	(ii) Structural	m ³	1 482	1 005	1 489 410
	7.3	(c) Reinforcing	t	12 350	75	930 881
		SUB-TOTAL				432 111 451

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Gates	Sum	56 420 000	1	56 420 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	35	691 600
				-		
9	9.0	Fencing	km	27 664	4.2	115 871
10	10.0	Landscaping (% of 1-9)	%	5		21 605 573
11	11.0	Miscellaneous (% of 1-9)	%	10		43 211 145
		SUB TOTAL A				554 755 640
12	12.0	Preliminary & General (% of sub-total A)	%	30		166 426 692
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.0	350 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				721 932 332
15	15.0	Contingencies	%	20		144 386 466
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				866 318 798
16	16.0	Planning design & supervision	%	15		129 947 820
		(% of sub-total C)				
		SUB TOTAL D				996 266 618
17	17.0	VAT				
		(% of sub-total D)	%	14		139 477 327
		NETT PROJECT COST				1 135 743 944
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				1 135 743 944

Live Storage Volume = 11 200 000 m³

No	DESCRIPTION	AMOUNT (Rand)
1	Terminal Dams a) Dam 1 b) Dam 2 c) Dam 3 d) Dam 4	256 399 811 191 978 801 315 205 884 309 099 087
		1 072 683 582

TERMINAL DAM COST MODEL						
DAM SITE 1						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	0.9	4 977
	1.2	b) Bush	ha	16 598	2.2	37 322
	1.3	c) Trees	ha	27 664	5.8	161 735
	1.4	d) Bush clearing of dam basin	ha	16 598	90.6	1 503 880
2	2.0	River diversion	Sum	1 725 000	1.0	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	45 252	1 810 061
	3.1.2	(ii) extra over for rock	m ³	71	6 788	481 929
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	30 037	1 772 156
	3.2.2	(ii) extra over for rock	m ³	99	4 142	410 100
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	46 519	930 373
	4.2	b) extra over for rock	m ²	20	34 889	697 779
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	6 429	2 848 215
	5.2	(b) Consolidation grouting	m drill	443	3 620	1 603 714
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Rockfill	m ³	47	573 349	26 947 413
	6.2	(b) Filters	m ³	174	81 907	14 251 823
	6.3	(c) Rip-rap	m ³	95	27 302	2 593 723
	6.4	(d) Geofabric	m ²	30	76 997	2 309 919
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	8 993	2 311 080
	7.1.2	(ii) Intricate	m ²	316	504	159 264
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	4 666	5 394 428
	7.2.2	(ii) Structural	m ³	1 482	10 588	15 691 966
	7.3	(c) Reinforcing	t	12 350	1 538	18 994 765
		SUB-TOTAL				102 641 621

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	4 556 000	1	4 556 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	6.1	125 994
10	10.0	Landscaping (% of 1-9)	%	5		5 419 893
11	11.0	Miscellaneous (% of 1-9)	%	10		10 839 786
		SUB TOTAL A				124 657 533
12	12.0	Preliminary & General (% of sub-total A)	%	30		37 397 260
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.5	525 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				162 979 793
15	15.0	Contingencies	%	20		32 595 959
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				195 575 752
16	16.0	Planning design & supervision	%	15		29 336 363
		(% of sub-total C)				
		SUB TOTAL D				224 912 115
17	17.0	VAT				
		(% of sub-total D)	%	14		31 487 696
		NETT PROJECT COST				256 399 811
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				256 399 811

TERMINAL DAM COST MODEL						
DAM SITE 2						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	0.5	2 955
	1.2	b) Bush	ha	16 598	1.3	22 159
	1.3	c) Trees	ha	27 664	3.5	96 024
	1.4	d) Bush clearing of dam basin	ha	16 598	95.46	1 584 421
2	2.0	River diversion	Sum	1 725 000	1.0	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	40 994	1 639 770
	3.1.2	(ii) extra over for rock	m ³	71	6 149	436 589
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	29 708	1 752 792
	3.2.2	(ii) extra over for rock	m ³	99	2 700	267 339
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	46 519	930 373
	4.2	b) extra over for rock	m ²	20	34 889	697 779
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	4 002	1 772 894
	5.2	(b) Consolidation grouting	m drill	443	2 186	968 558
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Rockfill	m ³	47	351 568	16 523 685
	6.2	(b) Filters	m ³	174	50 224	8 738 970
	6.3	(c) Rip-rap	m ³	95	16 741	1 590 426
	6.4	(d) Geofabric	m ²	30	47 277	1 418 314
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	9 169	2 356 430
	7.1.2	(ii) Intricate	m ²	316	484	152 818
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	4 478	5 176 082
	7.2.2	(ii) Structural	m ³	1 482	8 088	11 986 300
	7.3	(c) Reinforcing	t	12 350	1 248	15 411 291
		SUB-TOTAL				75 250 967

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	4 556 000	1	4 556 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	6.3	125 994
10	10.0	Landscaping (% of 1-9)	%	5		4 050 360
11	11.0	Miscellaneous (% of 1-9)	%	10		8 100 720
		SUB TOTAL A				93 158 281
12	12.0	Preliminary & General (% of sub-total A)	%	30		27 947 484
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.5	525 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				122 030 766
15	15.0	Contingencies	%	20		24 406 153
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				146 436 919
16	16.0	Planning design & supervision	%	15		21 965 538
		(% of sub-total C)				
		SUB TOTAL D				168 402 457
17	17.0	VAT				
		(% of sub-total D)	%	14		23 576 344
		NETT PROJECT COST				191 978 801
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				191 978 801

TERMINAL DAM COST MODEL						
DAM SITE 3						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	1.1	6 006
	1.2	b) Bush	ha	16 598	2.7	45 042
	1.3	c) Trees	ha	27 664	7.1	195 189
	1.4	d) Bush clearing of dam basin	ha	16 598	60.07	997 088
2	2.0	River diversion	Sum	1 725 000	1.0	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	58 515	2 340 596
	3.1.2	(ii) extra over for rock	m ³	71	8 777	623 184
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	28 126	1 659 408
	3.2.2	(ii) extra over for rock	m ³	99	4 687	464 006
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	46 519	930 373
	4.2	b) extra over for rock	m ²	20	34 889	697 779
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	8 499	3 764 952
	5.2	(b) Consolidation grouting	m drill	443	4 681	2 073 768
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Rockfill	m ³	47	776 509	36 495 942
	6.2	(b) Filters	m ³	174	110 930	19 301 805
	6.3	(c) Rip-rap	m ³	95	36 977	3 512 781
	6.4	(d) Geofabric	m ²	30	101 140	3 034 203
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	8 763	2 252 003
	7.1.2	(ii) Intricate	m ²	316	581	183 533
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	5 378	6 216 436
	7.2.2	(ii) Structural	m ³	1 482	12 608	18 684 940
	7.3	(c) Reinforcing	t	12 350	1 817	22 440 871
		SUB-TOTAL				127 644 905

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	4 556 000	1	4 556 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	5.0	125 994
10	10.0	Landscaping (% of 1-9)	%	5		6 670 057
11	11.0	Miscellaneous (% of 1-9)	%	10		13 340 114
		SUB TOTAL A				153 411 309
12	12.0	Preliminary & General (% of sub-total A)	%	30		46 023 393
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.5	525 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				200 359 702
15	15.0	Contingencies	%	20		40 071 940
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				240 431 643
16	16.0	Planning design & supervision	%	15		36 064 746
		(% of sub-total C)				
		SUB TOTAL D				276 496 389
17	17.0	VAT				
		(% of sub-total D)	%	14		38 709 494
		NETT PROJECT COST				315 205 884
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				315 205 884

TERMINAL DAM COST MODEL						
DAM SITE 4						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	0.9	5 057
	1.2	b) Bush	ha	16 598	2.3	37 923
	1.3	c) Trees	ha	27 664	5.9	164 337
	1.4	d) Bush clearing of dam basin	ha	16 598	99.59	1 653 045
2	2.0	River diversion	Sum	1 725 000	1.0	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	96 094	3 843 762
	3.1.2	(ii) extra over for rock	m ³	71	14 414	1 023 402
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	65 620	3 871 608
	3.2.2	(ii) extra over for rock	m ³	99	4 101	406 002
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	46 519	930 373
	4.2	b) extra over for rock	m ²	20	34 889	697 779
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	5 628	2 493 353
	5.2	(b) Consolidation grouting	m drill	443	3 844	1 702 786
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Rockfill	m ³	47	605 714	28 468 556
	6.2	(b) Filters	m ³	174	86 531	15 056 318
	6.3	(c) Rip-rap	m ³	95	28 844	2 740 135
	6.4	(d) Geofabric	m ²	30	82 347	2 470 410
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	17 635	4 532 160
	7.1.2	(ii) Intricate	m ²	316	451	142 579
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	4 178	4 829 298
	7.2.2	(ii) Structural	m ³	1 482	15 535	23 022 815
	7.3	(c) Reinforcing	t	12 350	2 043	25 231 709
		SUB-TOTAL				125 048 405

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	4 556 000	1	4 556 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	6.4	125 994
10	10.0	Landscaping (% of 1-9)	%	5		6 540 232
11	11.0	Miscellaneous (% of 1-9)	%	10		13 080 464
		SUB TOTAL A				150 425 334
12	12.0	Preliminary & General (% of sub-total A)	%	30		45 127 600
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.5	525 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				196 477 935
15	15.0	Contingencies	%	20		39 295 587
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				235 773 522
16	16.0	Planning design & supervision	%	15		35 366 028
		(% of sub-total C)				
		SUB TOTAL D				271 139 550
17	17.0	VAT				
		(% of sub-total D)	%	14		37 959 537
		NETT PROJECT COST				309 099 087
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				309 099 087

ABSTRACTION WEIR COST MODEL		
No	DESCRIPTION	AMOUNT (Rand)
1	Boschkop Works	
	a) Abstraction Weir	157 016 779
	b) Siltation Works	41 070 506
	c) Balancing Dam	70 488 078
	SUB-TOTAL BOSCHKOP	268 575 363
1	Vlieëpoort Works	
	a) Abstraction Weir	138 289 354
	b) Siltation Works	37 197 270
	c) Balancing Dam	44 378 377
	SUB-TOTAL VLIEËPOORT	219 865 001
	TOTAL PROJECT COST	488 440 364

ABSTRACTION WEIR COST MODEL						
Boschkop Weir						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	1.5	41 496
2	2.0	River diversion	Sum	1 725 000	1	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	17 361	694 440
	3.1.2	(ii) extra over for rock	m ³	71	1 736	123 263
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	-	-
	3.2.2	(ii) extra over for rock	m ³	99	-	-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	8 473	169 460
	4.2	b) extra over for rock	m ²	20	847	16 946
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	8 300	36 271 000
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	11 454	538 320
	6.2	(b) Filters	m ³	174	2 004	348 763
	6.3	(c) Rip-rap	m ³	95	10 263	974 985
	6.4	(d) Geofabric	m ²	30	7 894	236 820
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	12 800	3 289 600
	7.1.2	(ii) Intricate	m ²	316	960	303 360
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	4 748	5 488 688
	7.2.2	(ii) Structural	m ³	1 482	3 275	4 853 550
	7.3	(c) Reinforcing	t	12 350	180	2 224 544
		SUB-TOTAL				57 316 833

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	9 290 000	1	9 290 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	1.9	53 908
10	10.0	Landscaping (% of 1-9)	%	5		2 865 842
11	11.0	Miscellaneous (% of 1-9)	%	10		5 731 683
		SUB TOTAL A				76 332 506
12	12.0	Preliminary & General (% of sub-total A)	%	30		22 899 752
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.5	175 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				99 807 258
15	15.0	Contingencies	%	20		19 961 452
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				119 768 710
16	16.0	Planning design & supervision	%	15		17 965 307
		(% of sub-total C)				
		SUB TOTAL D				137 734 017
17	17.0	VAT				
		(% of sub-total D)	%	14		19 282 762
		NETT PROJECT COST				157 016 779
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				157 016 779

ABSTRACTION WEIR COST MODEL						
Vlieëpoort Weir						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	1.5	41 496
2	2.0	River diversion	Sum	1 725 000	1	1 725 000
3	3.0	Excavation				
	3.1	(a) Bulk				
	3.1.1	(i) all materials	m ³	40	12 189	487 560
	3.1.2	(ii) extra over for rock	m ³	71	1 219	86 542
	3.2	(b) Confined				
	3.2.1	(i) all materials	m ³	59	-	-
	3.2.2	(ii) extra over for rock	m ³	99	-	-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	6 778	135 560
	4.2	b) extra over for rock	m ²	20	678	13 556
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	6 200	27 094 000
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	26 007	1 222 329
	6.2	(b) Filters	m ³	174	4 551	791 913
	6.3	(c) Rip-rap	m ³	95	9 288	882 360
	6.4	(d) Geofabric	m ²	30	7 144	214 320
	6.5	(e) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	11 568	2 972 976
	7.1.2	(ii) Intricate	m ²	316	868	274 162
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	3 425	3 959 300
	7.2.2	(ii) Structural	m ³	1 482	3 275	4 853 550
	7.3	(c) Reinforcing	t	12 350	180	2 224 544
		SUB-TOTAL				46 995 765

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves, Screens & Gates	Sum	11 840 000	1	11 840 000
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	2.9	81 572
10	10.0	Landscaping (% of 1-9)	%	5		2 349 788
11	11.0	Miscellaneous (% of 1-9)	%	10		4 699 577
		SUB TOTAL A				67 040 943
12	12.0	Preliminary & General (% of sub-total A)	%	30		20 112 283
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	1.0	350 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				87 903 225
15	15.0	Contingencies	%	20		17 580 645
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				105 483 870
16	16.0	Planning design & supervision	%	15		15 822 581
		(% of sub-total C)				
		SUB TOTAL D				121 306 451
17	17.0	VAT				
		(% of sub-total D)	%	14		16 982 903
		NETT PROJECT COST				138 289 354
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				138 289 354

ABSTRACTION WEIR COST MODEL						
Boschkop De-Silting Works						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	0.5	8 299
	1.3	c) Trees	ha	27 664	1.0	27 664
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	-	-
	2.1.2	(ii) extra over for rock	m ³	71	-	-
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59		-
	2.2.2	(ii) extra over for rock	m ³	99		-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	9 200	184 000
	4.2	b) extra over for rock	m ²	20	5 520	110 400
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	47 388	2 227 246
	6.2	(b) Filters	m ³	174	8 293	1 442 971
	6.3	(c) Rip-rap	m ³	95	1 219	115 827
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	6 514	1 674 098
	7.1.2	(ii) Intricate	m ²	316	977	308 764
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	240	277 787
	7.2.2	(ii) Structural	m ³	1 482	3 204	4 748 328
	7.3	(c) Reinforcing	t	12 350	176	2 176 317
		SUB-TOTAL				13 301 700

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Gates	Sum	4 190 800	1	4 190 800
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	1.1	31 394
10	10.0	Landscaping (% of 1-9)	%	5		665 085
11	11.0	Miscellaneous (% of 1-9)	%	10		1 330 170
		SUB TOTAL A				20 593 389
12	12.0	Preliminary & General (% of sub-total A)	%	30		6 178 017
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				27 241 406
15	15.0	Contingencies	%	15		4 086 211
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				31 327 617
16	16.0	Planning design & supervision	%	15		4 699 143
		(% of sub-total C)				
		SUB TOTAL D				36 026 760
17	17.0	VAT				
		(% of sub-total D)	%	14		5 043 746
		NETT PROJECT COST				41 070 506
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				41 070 506

ABSTRACTION WEIR COST MODEL						
Vlieëpoort De-Silting Works						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	0.5	8 299
	1.3	c) Trees	ha	27 664	1.0	27 664
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	-	-
	2.1.2	(ii) extra over for rock	m ³	71	-	-
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59		-
	2.2.2	(ii) extra over for rock	m ³	99		-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	8 000	160 000
	4.2	b) extra over for rock	m ²	20	4 800	96 000
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	26 066	1 225 079
	6.2	(b) Filters	m ³	174	4 561	793 695
	6.3	(c) Rip-rap	m ³	95	918	87 238
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	6 514	1 674 098
	7.1.2	(ii) Intricate	m ²	316	977	308 764
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	240	277 787
	7.2.2	(ii) Structural	m ³	1 482	3 204	4 748 328
	7.3	(c) Reinforcing	t	12 350	176	2 176 317
		SUB-TOTAL				11 583 268

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Gates	Sum	4 190 800	1	4 190 800
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	1.1	31 394
10	10.0	Landscaping (% of 1-9)	%	5		579 163
11	11.0	Miscellaneous (% of 1-9)	%	10		1 158 327
		SUB TOTAL A				18 617 193
12	12.0	Preliminary & General (% of sub-total A)	%	30		5 585 158
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				24 672 351
15	15.0	Contingencies	%	15		3 700 853
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				28 373 203
16	16.0	Planning design & supervision	%	15		4 255 980
		(% of sub-total C)				
		SUB TOTAL D				32 629 184
17	17.0	VAT				
		(% of sub-total D)	%	14		4 568 086
		NETT PROJECT COST				37 197 270
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				37 197 270

ABSTRACTION WEIR COST MODEL						
Boschkop Balancing Dam						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	7.0	193 648
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	-	-
	2.1.2	(ii) extra over for rock	m ³	71	-	-
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59		-
	2.2.2	(ii) extra over for rock	m ³	99		-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	46 300	926 000
	4.2	b) extra over for rock	m ²	20	27 780	555 600
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	242 000	11 374 000
	6.2	(b) Filters	m ³	174	42 350	7 368 900
	6.3	(c) Rip-rap	m ³	95	4 170	396 150
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
	6.5	(e) Waterproof Membrane System	m ²	100	31 100	3 110 000
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	2 200	565 400
	7.1.2	(ii) Intricate	m ²	316	330	104 280
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	601	694 756
	7.2.2	(ii) Structural	m ³	1 482	750	1 111 500
	7.3	(c) Reinforcing	t	12 350	41	509 438
		SUB-TOTAL				26 926 270

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Screens	Sum	2 006 800	1	2 006 800
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	2.1	58 013
10	10.0	Landscaping (% of 1-9)	%	5		1 346 313
11	11.0	Miscellaneous (% of 1-9)	%	10		2 692 627
		SUB TOTAL A				34 104 263
12	12.0	Preliminary & General (% of sub-total A)	%	30		10 231 279
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				44 805 542
15	15.0	Contingencies	%	20		8 961 108
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				53 766 650
16	16.0	Planning design & supervision	%	15		8 064 998
		(% of sub-total C)				
		SUB TOTAL D				61 831 648
17	17.0	VAT				
		(% of sub-total D)	%	14		8 656 431
		NETT PROJECT COST				70 488 078
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				70 488 078

ABSTRACTION WEIR COST MODEL						
Vlieëpoort Balancing Dam						
No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
1	1.0	Clearing				
	1.1	a) Sparse	ha	5 533	-	-
	1.2	b) Bush	ha	16 598	1.0	16 598
	1.3	c) Trees	ha	27 664	7.0	193 648
2	2.0	Excavation				
	2.1	(a) Bulk				
	2.1.1	(i) all materials	m ³	40	26 160	1 046 388
	2.1.2	(ii) extra over for rock	m ³	71	15 696	1 114 404
	2.2	(b) Confined				
	2.2.1	(i) all materials	m ³	59		-
	2.2.2	(ii) extra over for rock	m ³	99		-
4	4.0	Preparation of solum				
	4.1	a) all materials	m ²	20	41 400	828 000
	4.2	b) extra over for rock	m ²	20	24 840	496 800
5	5.0	Drilling & Grouting				
	5.1	(a) Curtain grouting	m drill	443	-	-
	5.2	(b) Consolidation grouting	m drill	443	-	-
	5.3	(c) Jet grouting	m drill	4 370	-	-
6	6.0	Embankment				
	6.1	(a) Earthfill	m ³	47	74 400	3 496 800
	6.2	(b) Filters	m ³	174	13 020	2 265 480
	6.3	(c) Rip-rap	m ³	95	2 720	258 400
	6.4	(d) Overhaul beyond 5km	m ³ .km	4	-	-
	6.5	(e) Waterproof Membrane	m ²	100	31 100	3 110 000
7	7.0	Concrete works				
	7.1	a) Formwork				
	7.1.1	(i) Gang formed	m ²	257	2 200	565 400
	7.1.2	(ii) Intricate	m ²	316	330	104 280
	7.2	(b) Concrete				
	7.2.1	(i) Mass	m ³	1 156	528	610 368
	7.2.2	(ii) Structural	m ³	1 482	750	1 111 500
	7.3	(c) Reinforcing	t	12 350	41	509 438
		SUB-TOTAL				15 727 503

No	PAY REF	DESCRIPTION	UNIT	RATE 01-Apr-08 (Rand)	QUANTITY	AMOUNT (Rand)
8	8.0	Mechanical Items				
	8.1	(a) Pipes, Valves & Screens	Sum	2 118 800	1	2 118 800
	8.2	(b) Cranes & hoists	Sum	600 000	1	600 000
	8.3	(c) Structural steelwork	t	19 760	24	474 240
9	9.0	Fencing	km	27 664	2.1	58 013
10	10.0	Landscaping (% of 1-9)	%	5		786 375
11	11.0	Miscellaneous (% of 1-9)	%	10		1 572 750
		SUB TOTAL A				21 337 682
12	12.0	Preliminary & General (% of sub-total A)	%	30		6 401 305
13	13.0	Preliminary works				
	13.1	(a) Access road	km	350 000	0.2	70 000
	13.2	(b) Electricity to site	Sum	250 000	1	250 000
	13.3	(c) Water to site-construction (not potable)	Sum	150 000	1	150 000
	13.4	(d) Railhead & materials handling	Sum	-	1	-
14	14.0	Accommodation	Sum	-	1	-
		SUB TOTAL B				28 208 986
15	15.0	Contingencies	%	20		5 641 797
		(% of sub total B)				
		SUB TOTAL C (Civils Total)				33 850 784
16	16.0	Planning design & supervision	%	15		5 077 618
		(% of sub-total C)				
		SUB TOTAL D				38 928 401
17	17.0	VAT				
		(% of sub-total D)	%	14		5 449 976
		NETT PROJECT COST				44 378 377
18	18.0	Cost of relocations	Sum	-	1	-
19	19.0	Cost of land acquisition	Sum	-	1	-
		TOTAL PROJECT COST				44 378 377