

Appendix 6

Details and results of flotation tests

Table 1 Flotation Test Results of Hayl as Safil Ore
- Effect of feed size on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS										PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		P.D. Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.	%						Intial	Final									
1	GRINDING ROUGHER SCAVENGER	8	60	50	25	2000	30	27.9	12.1	11.7	C. Head	100.00	1.14	15.73	14.33	100.00	100.00	100.00	
		10	35						11.7	11.6		25.99	4.02	36.93	42.22	91.34	61.03	76.56	
		5							11.7			5.34	0.57	34.67	36.93	2.66	11.77	13.76	
										68.67	0.10	6.23	2.02	6.00	27.20	9.68			
2	GRINDING ROUGHER SCAVENGER	11	60	60	25	2000	30	27.9	12.0	11.8	C. Head	100.00	1.16	16.10	14.58	100.00	100.00	100.00	
		10	35						11.8	11.6		16.03	6.58	36.68	40.65	90.61	36.52	44.69	
		5							11.8			1.31	1.40	31.65	31.75	1.58	2.58	2.86	
										82.66	0.11	11.86	9.25	7.81	50.90	52.45			
3	GRINDING ROUGHER SCAVENGER	13	60	70	26	2000	30	27.9	12.1	11.8	C. Head	100.00	1.16	16.19	14.52	100.00	100.00	100.00	
		10	35						11.8	11.6		12.45	8.37	35.04	38.47	89.82	26.95	32.98	
		5							11.8			1.50	1.56	33.41	33.77	2.02	3.10	3.50	
										86.05	0.11	13.16	10.72	8.16	69.95	63.52			
4	GRINDING ROUGHER SCAVENGER	16	60	80	25	2000	30	27.9	12.0	11.6	C. Head	100.00	1.16	16.03	14.31	100.00	100.00	100.00	
		10	35						11.6	11.3		11.11	9.30	34.16	38.26	89.42	23.68	29.70	
		5							11.6			1.86	1.43	34.79	35.73	2.30	4.03	4.64	
										87.03	0.11	13.31	10.80	8.29	72.29	65.67			

Table 4 Flotation Test Results of Hayl as Safil Ore
 - Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCIS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P. D. Size %	Temp °C	Lime g/T	AP3418 g/T	AF65 g/T	PH		Cu %	Fe %			S %	Cu %	Fe %	S %		
								Initial	Final										
12	GRINDING	16	60	28	980	46.4	27.9	8.1	8.0		C. Head	100.00	1.17	16.05	14.53	100.00	100.00	100.00	
	ROUGHER	10	35			7.7	9.3	8.0	8.0		C-1	10.59	7.71	35.83	40.23	69.93	23.63	29.32	
	SCAVENGER	5									Tail	87.84	0.33	13.38	11.10	24.84	73.22	67.12	
13	GRINDING	16	60	29	1140	46.4	27.9	9.2	8.7		C. Head	100.00	1.18	16.42	14.73	100.00	100.00	100.00	
	ROUGHER	10	35			7.7	9.3	8.7	8.6		C-1	8.10	9.78	33.32	36.67	67.25	16.44	20.18	
	SCAVENGER	5								Tail	89.90	0.33	14.53	12.32	25.17	73.54	75.20		
14	GRINDING	16	60	28	1400	46.4	27.9	10.7	10.0		C. Head	100.00	1.17	16.31	14.54	100.00	100.00	100.00	
	ROUGHER	10	35			7.7	9.3	10.0	9.7		C-1	10.31	9.51	33.88	37.54	83.94	21.43	26.62	
	SCAVENGER	5								Tail	87.28	0.15	13.70	11.18	11.20	73.32	67.09		
15	GRINDING	16	60	30	2520	46.4	27.9	11.8	11.2		C. Head	100.00	1.15	15.65	14.62	100.00	100.00	100.00	
	ROUGHER	10	35			7.7	9.3	11.2	11.0		C-1	12.84	8.03	32.43	38.68	89.42	26.59	33.96	
	SCAVENGER	5								Tail	84.27	0.10	12.45	10.16	7.31	67.02	58.56		

Table 5 Flotation Test Results of Hayl as Safill Ore
 - Effect of AP404 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	AP404 g/T	AF65 g/T	pH		Cu %			Fe %	S %	Cu %	Fe %	S %	
									Intial	Final									
16	GRINDING	16	60		28	740	54.1	27.9	8.1	7.9			100.00	1.15	15.94	14.89	100.00	100.00	100.00
	ROUGHER	10	35	80			7.7	9.3	7.9	7.8			8.35	9.12	33.83	39.03	66.13	17.71	21.88
	SCAVENGER	5											89.64	0.32	13.93	12.21	24.92	78.33	73.51
17	GRINDING	16	60		28	1000	54.1	27.9	9.2	8.8			100.00	1.17	15.81	14.80	100.00	100.00	100.00
	ROUGHER	10	35	80			7.7	18.6	8.8	8.6			6.56	12.75	30.60	35.35	71.76	12.70	15.68
	SCAVENGER	5										91.11	0.23	14.31	12.77	17.97	82.47	78.63	
18	GRINDING	16	60		28	1400	54.1	27.9	10.8	10.0			100.00	1.17	15.91	14.85	100.00	100.00	100.00
	ROUGHER	10	35	80			7.7	9.3	10.0	9.6			7.98	12.01	30.72	35.84	82.19	15.41	19.27
	SCAVENGER	5										90.20	0.17	14.23	12.53	13.15	80.68	76.12	
19	GRINDING	16	60		30	2980	54.1	27.9	11.9	11.4			100.00	1.15	15.41	14.36	100.00	100.00	100.00
	ROUGHER	10	35	80			7.7	9.3	11.4	11.3			8.23	11.66	29.21	34.71	83.29	15.60	19.90
	SCAVENGER	5										90.04	0.16	13.83	12.10	12.51	80.80	75.89	

Table 6 Flotation Test Results of Haylas Safil Ore
 - Recovery as a function of flotation time on copper selective flotation varying KAX dosage -

TEST No.	OPER ATION	CONDITIONS										PROD UCIS	WEIGHT		ASSAY		DISTRIBUION	
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	pH		%		Cu %	Fe %	Cu %	Fe %		
									Initial	Final								
20	GRINDING	16	60		31	2080	30	18.6	11.6		C.Head	100.00	1.16	15.83	100.00	100.00		
	ROUGHENING	3	35	80					11.6		C-1	6.66	13.34	31.67	77.16	13.37		
		2								11.1		C-2	1.84	4.15	34.31	6.61	3.99	
		3								11.1		C-3	1.40	2.64	33.83	3.20	3.00	
		4								11.6		C-4	0.66	2.21	31.19	1.26	1.30	
		5								11.5		C-5	0.45	1.91	30.71	0.74	0.87	
	6					5	9.3	11.6	11.0		C-6	2.55	1.61	33.71	3.55	5.42		
											Tail	86.42	0.10	13.20	7.48	72.06		
21	GRINDING	16	60		30	2050	40	18.6	11.6		C.Head	100.00	1.12	15.31	100.00	100.00		
	ROUGHENING	3	35	80					11.6		C-1	10.44	8.28	33.79	76.99	23.03		
		2								11.0		C-2	2.22	3.76	32.79	7.43	4.75	
		3								11.4		C-3	1.66	2.90	30.54	4.28	3.30	
		4								11.0		C-4	0.77	2.32	27.53	1.58	1.38	
		5								11.4		C-5	0.71	1.92	25.78	1.21	1.19	
	6					5	9.3	11.4	11.2		C-6	2.45	1.56	30.54	3.41	4.89		
											Tail	81.77	0.07	11.51	5.10	61.46		

Table 7 Flotation Test Results of Hayl as Safil Ore
- Effect of feed size on bulk flotation -

TEST No.	OPER ATION	CONDITIONS					PROD UCTS	WEIGHT %	ASSAY			DISTRIBUION			
		Time min.	P.D. Size %	Temp °C	Lime g/T	KAX g/T			AF65 g/T	PH Intial	PH Final	Cu %	Fe %	S %	Cu %
22	GRINDING	8	60					C. Head	100.00	1.16	15.99	15.56	100.00	100.00	100.00
	ROUGHER	10	35	29	620	30	37.2	C-1	32.74	2.99	36.05	42.01	84.45	73.81	88.42
	SCAVENGER	5				5	9.3	C-2	3.17	2.45	20.71	20.45	6.71	4.11	4.17
								Tail	64.08	0.16	5.51	1.80	8.84	22.08	7.41
23	GRINDING	11	60					C. Head	100.00	1.18	15.97	15.47	100.00	100.00	100.00
	ROUGHER	10	35	29	880	30	37.2	C-1	29.51	3.16	36.91	43.02	78.83	68.20	82.09
	SCAVENGER	5				5	18.6	C-2	3.87	2.68	23.14	22.66	8.78	5.61	5.68
								Tail	66.61	0.22	6.28	2.84	12.39	26.19	12.23

Table 11 Flotation Test Results of Rakah Stockwork Ore
- Effect of feed size on copper selective flotation -

TEST No.	OPERATION	CONDITIONS							PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION			
		Time min.	P. D. %	Size %	Temp °C	Lime g/l	KAX g/l	AF65 g/l			PH Intial	PH Final	Cu %	Fe %	S %	Cu %	Fe %
32	GRINDING ROUGHER SCAVENGER	9	60	50	27	25	27.9	10.8	10.0	C. Head	100.00	1.25	19.89	9.62	100.00	100.00	100.00
		10	35	50	27	5	9.3	10.0	9.6	C-1	20.81	5.55	36.44	38.37	92.48	38.13	82.98
		5								C-2	2.80	1.17	30.70	28.31	2.62	4.32	7.66
									Tail	76.39	0.08	14.98	1.18	4.89	57.55	9.37	
33	GRINDING ROUGHER SCAVENGER	11	60	60	27	25	27.9	10.7	9.8	C. Head	100.00	1.25	20.11	9.54	100.00	100.00	100.00
		10	35	60	27	5	9.3	9.8	9.6	C-1	18.54	6.16	37.46	39.57	91.48	34.54	76.95
		5								C-2	2.85	1.53	34.65	31.95	3.49	4.90	9.53
									Tail	78.61	0.08	15.49	1.64	5.04	60.56	13.52	
34	GRINDING ROUGHER SCAVENGER	13	60	70	27	25	27.9	10.8	10.1	C. Head	100.00	1.28	20.14	9.72	100.00	100.00	100.00
		10	35	70	27	5	9.3	10.1	9.8	C-1	17.39	6.84	37.58	39.97	93.23	32.47	71.53
		5								C-2	1.62	1.33	34.53	31.84	1.69	2.78	5.31
									Tail	80.98	0.08	16.10	2.78	5.08	64.75	23.16	
35	GRINDING ROUGHER SCAVENGER	16	60	80	27	25	27.9	10.6	9.9	C. Head	100.00	1.25	20.05	9.71	100.00	100.00	100.00
		10	35	80	27	5	4.7	9.9	9.6	C-1	14.29	8.24	37.20	39.60	94.04	26.51	58.27
		5								C-2	1.63	0.97	33.38	28.90	1.26	2.71	4.85
									Tail	84.08	0.07	16.88	4.26	4.70	70.78	36.88	

Table 12 Flotation Test Results of Rakah Stockwork Ore
- Effect of KAX on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		P. D. Size %	Temp °C	Lime g/l	KAX g/l	AF65 g/l	pH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.	%						Initial	Final									
36	GRINDING ROUGHER SCAVEN- GER	16	60	80	27	1000	25	27.9	8.7	8.2	C. Head	100.00	1.35	20.07	9.40	100.00	100.00	100.00	
		10	35									19.86	6.48	37.68	38.13	94.63	37.29	80.60	
		5	5									2.69	0.70	31.27	26.03	1.38	4.19	7.45	
											Tail	77.45	0.07	15.17	1.45	3.99	58.52	11.95	
37	GRINDING ROUGHER SCAVEN- GER	16	60	80	27	1500	25	27.9	9.6	8.9	C. Head	100.00	1.35	19.92	9.32	100.00	100.00	100.00	
		10	35									18.01	7.12	37.18	37.64	95.03	33.62	72.72	
		5	5									2.26	0.85	32.40	27.88	1.42	3.67	6.76	
											Tail	79.73	0.06	15.67	2.40	3.54	62.71	20.52	
35	GRINDING ROUGHER SCAVEN- GER	16	60	80	27	2000	25	27.9	10.6	9.9	C. Head	100.00	1.25	20.05	9.71	100.00	100.00	100.00	
		10	35									14.29	8.24	37.20	39.60	94.04	26.51	58.27	
		5	5									1.63	0.97	33.38	28.90	1.26	2.71	4.85	
											Tail	84.08	0.07	16.88	4.26	4.70	70.78	36.88	
38	GRINDING ROUGHER SCAVEN- GER	15	60	80	27	4000	25	27.9	11.4	10.9	C. Head	100.00	1.25	19.96	9.41	100.00	100.00	100.00	
		10	35									12.89	9.04	37.05	39.05	93.58	23.93	53.53	
		5	5									1.03	1.91	30.02	24.92	1.59	1.56	2.74	
											Tail	86.07	0.07	17.28	4.78	4.84	74.51	43.73	

Table 13 Flotation Test Results of Rakah Stockwork Ore
 - Effect of AP3501 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS							PROD UCIS	WEIGHT %	ASSAY			DISTRIBUTION			
		Time min.	P.D. Size %	Temp °C	Lime g/T	AF65 g/T	AF65 g/T	pH Initial			pH Final	Cu %	Fe %	S %	Cu %	Fe %	S %
39	GRINDING	16	60						100.00	1.26	20.12	9.45	100.00	100.00	100.00		
	ROUGHER	10	35	27	620	40.9	27.9	8.1	7.8	6.69	36.82	38.36	93.54	32.28	71.60		
	SCAVENGER	5				5.8	9.3	7.8	7.6	0.80	32.34	28.80	1.37	3.48	6.60		
40	GRINDING	16	60						100.00	1.24	16.27	9.59	100.00	100.00	100.00		
	ROUGHER	10	35	29	1500	40.9	18.6	9.4	8.8	8.47	35.82	37.61	92.49	29.85	53.20		
	SCAVENGER	5				5.8	9.3	8.8	8.6	1.04	32.09	28.59	2.10	4.95	7.48		
41	GRINDING	16	60						100.00	1.25	20.11	9.56	100.00	100.00	100.00		
	ROUGHER	10	35	29	2000	40.9	18.6	10.6	9.8	10.61	31.90	31.88	92.87	17.30	36.35		
	SCAVENGER	5				5.8	9.3	9.8	9.4	1.33	34.16	30.62	2.24	3.56	6.71		
42	GRINDING	16	60						100.00	0.07	18.29	6.26	100.00	100.00	100.00		
	ROUGHER	10	35	29	4000	40.9	9.3	12.2	11.8	can not control froth							
	SCAVENGER	5				5.8	9.3	11.8	11.6								

Table 14 Flotation Test Results of Rakah Stockwork Ore
- Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		P.D. Size %	Temp °C	Lime g/T	AP3418 g/T	AF65 g/T	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.							Initial	Final									
43	GRINDING	16	60	80	28	1500	38.7	27.9	9.4	8.8	C. Head	100.00	1.26	20.29	9.73	100.00	100.00	100.00	
	ROUGHER	10	35	80	28	1500	38.7	27.9	9.4	8.8	C-1	16.49	7.14	36.32	38.39	93.75	29.52	65.07	
	SCAVENGER	5					7.7	9.3	8.8	8.7	C-2 Tail	4.24 79.27	0.73 0.06	37.81 16.02	38.06 2.25	2.47 3.79	7.91 62.58	16.60 18.33	
44	GRINDING	16	60	80	29	2000	38.7	27.9	10.3	9.6	C. Head	100.00	1.26	21.23	9.46	100.00	100.00	100.00	
	ROUGHER	10	35	80	29	2000	38.7	27.9	10.3	9.6	C-1	13.09	9.09	34.18	34.77	94.65	21.07	48.11	
	SCAVENGER	5					7.7	9.3	9.6	9.4	C-2 Tail	2.90 84.01	0.58 0.06	36.54 18.68	34.49 4.65	1.34 4.01	5.00 73.93	10.59 41.31	
45	GRINDING	16	60	80	27	3400	38.7	18.5	12.0	11.6	C. Head	100.00	1.24	19.57	9.67	100.00	100.00	100.00	
	ROUGHER	10	35	80	27	3400	38.7	18.5	12.0	11.6	C-1	9.14	12.89	28.71	28.90	94.64	13.41	27.30	
	SCAVENGER	5					7.7	9.3	11.6	11.4	C-2 Tail	0.90 89.96	1.41 0.06	28.51 18.55	22.60 7.59	1.02 4.34	1.32 85.28	2.11 70.59	
46	GRINDING	16	60	80	29	2000	30.9	27.9	10.6	9.8	C. Head	100.00	1.27	21.53	9.55	100.00	100.00	100.00	
	ROUGHER	10	35	80	29	2000	30.9	27.9	10.6	9.8	C-1	12.38	9.58	35.42	35.39	93.45	20.36	45.87	
	SCAVENGER	5					7.7	9.3	9.8	9.6	C-2 Tail	2.60 85.02	0.58 0.08	40.07 18.94	37.94 4.92	1.19 5.36	4.84 74.80	10.33 43.81	

Table 15 Flotation Test Results of Rakah Stockwork Ore
 - Effect of AP404 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	AF404 g/T	AF65 g/T	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
									Initial	Final									
47	GRINDING	16	60		28	820	38.7	18.6		8.0	7.7	C. Head	100.00	1.28	19.56	10.09	100.00	100.00	100.00
	ROUGHER	10	35	80			7.7	9.3	7.7	7.6	C-1	16.58	7.14	36.39	40.43	92.72	30.84	66.45	
	SCAVENGER	5							7.7	7.6	C-2	3.49	0.83	34.50	33.79	2.27	6.15	11.67	
											Tail	79.94	0.08	15.42	2.76	5.01	63.01	21.87	
48	GRINDING	16	60		29	1500	38.7	27.9	9.3	8.7	C. Head	100.00	1.24	19.59	9.77	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	8.7	8.6	C-1	11.65	9.94	33.83	36.63	93.02	20.12	43.67	
	SCAVENGER	5							8.7	8.6	C-2	2.14	0.84	34.84	33.68	1.44	3.80	7.36	
											Tail	86.21	0.08	17.29	5.55	5.54	76.09	48.97	
49	GRINDING	16	60		28	2620	38.7	23.3	11.0	10.2	C. Head	100.00	1.26	19.50	9.87	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	10.2	9.9	C-1	7.59	15.14	29.85	32.89	91.33	11.62	25.29	
	SCAVENGER	5							10.2	9.9	C-2	1.28	2.11	31.84	29.93	2.15	2.09	3.89	
											Tail	91.13	0.09	18.46	7.67	6.52	86.29	70.83	
50	GRINDING	16	60		29	2000	30.9	27.9	10.8	10.0	C. Head	100.00	1.25	20.11	9.36	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	10.0	9.8	C-1	8.45	13.52	31.65	28.82	91.26	13.30	26.01	
	SCAVENGER	5							10.0	9.8	C-2	1.58	1.80	31.02	26.23	2.27	2.44	4.42	
											Tail	89.97	0.09	18.84	7.24	6.47	84.27	69.56	

Table 16 Flotation Test Results of Rakah Stockwork Ore
 - Recovery as a function of flotation time on copper selective flotation varying KAX dosage -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY		DISTRIBUTION			
		Time min.	P.D. %	Size %	Temp °C	Lime g/I	KAX g/I	AF65 g/I	PH		Cu %			Fe %	Cu %	Fe %			
									Initial	Final									
51	GRINDING ROUGHEN	16	60	80	30	2240	25	18.6		10.6			C-Head	100.00	1.26	19.35	100.00	100.00	
		3	35											C-1	10.98	9.80	32.75	85.74	18.59
		4				200		9.3		10.6	9.4			C-2	1.67	4.25	29.75	5.64	2.56
		5				100		9.3		10.4	9.8			C-3	1.13	2.06	24.23	1.85	1.41
		6				200		9.3		10.7	9.7			C-4	0.50	1.82	24.23	0.73	0.53
		10				300	5	9.3		10.6	9.8			C-5	0.30	1.14	22.32	0.27	0.34
												Tail	84.44	0.07	17.23	4.71	75.21		
52	GRINDING ROUGHEN	16	60	80	31	2320	35	18.6		10.5			C-Head	100.00	1.23	19.01	100.00	100.00	
		3	35											C-1	16.20	6.90	35.65	90.52	30.37
		4				200		9.3		10.8	9.6			C-2	1.59	2.75	29.21	3.54	2.44
		5				100		9.3		10.0	10.0			C-3	0.83	2.05	23.37	1.38	1.02
		6				200	5	9.3		10.4	9.6			C-4	0.49	1.45	21.94	0.58	0.57
		10												C-5	0.35	0.92	20.86	0.26	0.39
												Tail	79.72	0.74	22.53	0.49	0.98		
														0.05	15.32	3.23	64.23		

Table 17. Flotation Test Results of Rakah Stockwork Ore
 - Effect of feed size on bulk flotation -

TEST No.	OPERATION	CONDITIONS				PROD UCIS	WEIGHT %	ASSAY			DISTRIBUTION					
		Time min.	P.D. Size %	Temp °C	Lime g/T			KAX g/T	AF65 g/T	pH Initial	pH Final	Cu %	Fe %	S %	Cu %	Fe %
53	GRINDING	9	60	27	420	25	27.9	7.0	7.1	C. Head	100.00	20.20	10.28	100.00	100.00	100.00
	ROUGHER	10	35	50		5	9.3	7.1	7.2	C-1	24.59	36.93	35.72	93.28	44.96	85.49
	SCAVENGER	5						7.2		tail	2.29	23.49	14.04	1.86	2.56	3.13
											73.12	14.47	1.60	4.86	52.38	11.38
54	GRINDING	11	60	26	660	25	27.9	7.0	7.2	C. Head	100.00	19.89	9.44	100.00	100.00	100.00
	ROUGHER	10	35	60		5	9.3	7.2	7.3	C-1	20.64	36.57	37.54	90.95	37.95	82.10
	SCAVENGER	5						7.3		tail	3.49	27.11	19.70	3.59	4.76	7.29
											75.87	15.02	1.32	5.45	57.29	10.61

Table 18 Flotation Test Results of Rakah Stockwork Ore
- Effect of pH value on bulk flotation -

TEST No.	OPER ACTION	CONDITIONS										PROD UCIS	WEIGHTI %	ASSAY			DISTRIBUTION		
		Time		P.D. Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.	%						Initial	Final									
55	GRINDING ROUGHER SCAVENGER	9	60	50	28	H2SO4 701	25	27.9	3.9	4.7	C. Head	100.00	1.22	20.15	9.48	100.00	100.00	100.00	
		10	35								C-1	26.12	4.37	35.17	33.74	93.31	45.59	93.01	
		5	5								C-2	2.05	1.19	20.85	8.82	2.00	2.12	1.91	
											Tail	71.83	0.08	14.67	0.67	4.70	52.29	5.08	
53	GRINDING ROUGHER SCAVENGER	9	60	50	27	420	25	27.9	7.0	7.1	C. Head	100.00	1.20	20.20	10.28	100.00	100.00	100.00	
		10	35								C-1	24.59	4.57	36.93	35.72	93.28	44.96	85.49	
		5	5								C-2	2.29	0.98	23.49	14.04	1.86	2.66	3.13	
											Tail	73.12	0.08	14.47	1.60	4.86	52.38	11.38	
56	GRINDING ROUGHER SCAVENGER	9	60	50	26	740	25	27.9	8.0	7.7	C. Head	100.00	1.28	19.98	10.27	100.00	100.00	100.00	
		10	35								C-1	23.78	4.93	35.54	36.64	91.55	42.31	84.82	
		5	5								C-2	1.96	1.35	24.74	16.30	2.07	2.43	3.11	
											Tail	74.25	0.11	14.87	1.67	6.38	55.26	12.07	
57	GRINDING ROUGHER SCAVENGER	9	60	50	26	1000	25	27.9	9.2	8.6	C. Head	100.00	1.29	19.77	9.80	100.00	100.00	100.00	
		10	35								C-1	22.51	5.18	36.05	37.00	90.41	41.06	84.98	
		5	5								C-2	3.05	1.37	25.25	17.99	3.24	3.90	5.61	
											Tail	74.43	0.11	14.62	1.24	6.35	55.04	9.42	
32	GRINDING ROUGHER SCAVENGER	9	60	50	27	2000	25	27.9	10.8	10.0	C. Head	100.00	1.25	19.89	9.62	100.00	100.00	100.00	
		10	35								C-1	20.81	5.55	36.44	38.37	92.48	38.13	82.98	
		5	5								C-2	2.80	1.17	30.70	26.31	2.62	4.32	7.65	
											Tail	76.39	0.08	14.98	1.18	4.89	57.55	9.37	

table 20 Flotation Test Results of Rakah Stockwork Ore
- Effect of pH value and KAX dosage on bulk rougher/cleaner flotation -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT			ASSAY			DISTRIBUTION		
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	pH		Cu %		Fe %	S %	Cu %	Fe %	S %				
									Initial	Final											
59	GRINDING	9	60	50	31	2600	45	65.1	10.6	10.2	C. Head	100.00	1.23	19.27	9.71	100.00	100.00	100.00			
	ROUGHER	30	35	50	31	2600	45	65.1	10.6	10.2	R-C	30.82	3.88	31.17	29.99	97.19	49.85	95.16			
	REGRINDING	4									IC-C	13.24	8.22	37.00	42.51	88.60	25.42	57.93			
	ICLEANER	5	12	90	26	250	1.4		10.2	10.0	IC-M	17.58	0.60	26.78	20.57	8.58	24.43	37.22			
	2CLEANER	4	14		26	50			10.4	9.8	Conc	12.16	8.60	37.29	43.29	85.10	23.53	54.20			
										2C-M	1.08	3.99	33.67	33.67	3.50	1.88	3.74				
										Tail	69.18	0.05	13.97	0.68	2.81	50.15	4.84				
60	GRINDING	9	60	50	31	2740	45	65.1	10.6	10.0	C. Head	100.00	1.24	22.22	9.53	100.00	100.00	100.00			
	ROUGHER	30	35	50	31	2740	45	65.1	10.6	10.0	R-C	31.46	3.79	40.07	28.76	96.13	56.75	94.96			
	REGRINDING	4									IC-C	12.54	8.69	36.51	41.54	87.89	20.61	54.68			
	ICLEANER	5	12	90	26	600	1.4		11.4	11.2	IC-M	18.92	0.54	42.43	20.29	8.24	36.14	40.29			
	2CLEANER	4	13		27	100			11.2	11.0	Conc	10.96	9.30	36.79	42.31	82.19	18.15	48.66			
										2C-M	1.58	4.47	34.54	36.20	5.71	2.46	6.01				
										Tail	68.54	0.07	14.02	0.70	3.87	43.25	5.04				
61	GRINDING	9	60	50	32	2660	45	74.4	10.6	10.3	C. Head	100.00	1.23	15.62	9.79	100.00	100.00	100.00			
	ROUGHER	30	35	50	32	2660	45	74.4	10.6	10.3	R-C	34.52	3.46	30.23	27.21	96.81	66.84	95.99			
	REGRINDING	4									IC-C	9.66	11.22	34.29	38.86	87.93	21.20	38.35			
	ICLEANER	5	13	90	27	1600	1.4		12.2	12.0	IC-M	24.87	0.44	28.66	22.69	8.88	45.63	57.64			
	2CLEANER	4	11		28	350			12.1	12.0	Conc	7.25	13.05	34.04	39.46	76.82	15.81	29.24			
										2C-M	2.40	5.70	35.04	37.05	11.12	5.39	9.10				
										Tail	65.48	0.06	7.91	0.60	3.19	33.16	4.01				
62	GRINDING	9	60	50	32	2440	45	55.8	10.8	10.6	C. Head	100.00	1.25	19.51	9.65	100.00	100.00	100.00			
	ROUGHER	30	35	50	32	2440	45	55.8	10.8	10.6	R-C	29.31	4.10	32.62	31.49	96.59	49.01	95.61			
	REGRINDING	6									IC-C	8.14	12.62	35.43	40.68	82.48	14.79	34.30			
	ICLEANER	5	12	95	27	1400	1.4		12.2	11.9	IC-M	21.17	0.83	31.54	27.96	14.11	34.23	61.31			
	2CLEANER	4	9		27	450			12.0	12.1	Conc	6.98	14.18	35.04	40.70	79.50	12.54	29.43			
										2C-M	1.16	3.21	37.80	40.55	2.99	2.25	4.87				
										Tail	70.69	0.06	14.07	0.50	3.41	50.99	4.39				

Table 21 Flotation Test Results of Rakah Massive Ore
 - Preliminary tests on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS										PROD UCIS	WEIGHT			ASSAY			DISTRIBUTION		
		Time min.	p.D. %	Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	pH		Cu %		Fe %	S %	Cu %	Fe %	S %				
									Initial	Final											
63	GRINDING	10.5	50	80	28	11100	200	46.4	11.0		C. Head	100.00			100.00	100.00					
	ROUGHER	10	20							C-1	40.69	0.92	44.28	23.44	48.53						
	SCAV'ER1	5							10.3	C-2	5.22	2.64	42.02	8.63	5.91						
	SCAV'ER2	5							10.8	C-3	2.67	4.28	40.15	7.17	2.89						
	SCAV'ER3	10							10.8	C-4	3.19	4.87	38.70	9.72	3.32						
										Tail	48.23	1.69	30.29	51.05	39.35						
64	GRINDING	10.5	50	80	27	11475	200	46.4	11.1		C. Head	100.00			100.00	100.00					
	ROUGHER	10	20							C-1	37.13	0.96	43.27	21.50	43.85						
	SCAV'ER1	5							10.8	C-2	8.51	2.01	41.95	10.31	9.74						
	SCAV'ER2	5							10.8	C-3	4.97	2.93	40.27	8.78	5.46						
	SCAV'ER3	10							10.8	C-4	14.05	2.13	40.51	18.05	15.54						
										Tail	35.34	1.94	26.35	41.36	25.42						
65	GRINDING	16	50	94	27	14850	200	69.6	11.1		C. Head	100.00			100.00	100.00					
	ROUGHER	10	20							C-1	27.79	1.30	42.79	21.78	32.59						
	SCAV'ER1	5							10.8	C-2	4.92	3.59	39.43	10.66	5.32						
	SCAV'ER2	5							10.8	C-3	2.79	3.87	39.07	6.52	2.99						
	SCAV'ER3	10							10.9	C-4	14.02	2.04	41.35	17.24	15.88						
										Tail	50.47	1.44	31.25	43.81	43.22						
66	GRINDING	16	50	94	29	12500	200	46.4	11.0	6.5	C. Head	100.00			100.00	100.00					
	ROUGHER	10	20							C-1	30.96	1.54	44.23	29.29	36.84						
	SCAV'ER1	5							10.8	C-2	4.71	3.17	42.43	9.18	5.38						
	SCAV'ER2	5							10.8	C-3	3.10	3.82	40.75	7.27	3.40						
	SCAV'ER3	10							10.9	C-4	14.38	1.97	42.67	17.41	16.51						
										Tail	46.85	1.28	30.05	36.85	37.87						

Table 22 Flotation Test Results of Rakah Massive Ore
- Effect of feed size on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS						PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION				
		Timep. min.	D. Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T			PH Intial	PH Final	Cu %	Fe %	S %	Cu %	Fe %	S %
67	GRINDING	4	50	17500	150	46.4	10.0	C. Head	100.00	1.61	36.36	42.09	100.00	100.00	100.00		
	ROUGHER	10	20	1175	150	46.4	11.2	C-1	17.75	3.41	39.83	47.85	37.82	19.44	20.17		
	SCAV'ER1	10		250	50	11.6	11.2-10.8	C-2	5.63	2.63	40.31	45.28	9.21	6.24	6.06		
	SCAV'ER2	10		500	50	34.8	10.9	C-3	11.81	1.59	40.55	47.77	11.67	13.17	13.40		
								Tail	64.81	1.03	34.31	39.20	41.50	61.15	60.36		
68	GRINDING	6	50	17500	150	46.4	10.2	C. Head	100.00	1.51	36.21	41.87	100.00	100.00	100.00		
	ROUGHER	10	20	1075	150	46.4	11.2	C-1	22.01	2.30	41.75	47.29	33.57	25.38	24.86		
	SCAV'ER1	10		250	50	11.6	11.3-10.8	C-2	6.25	2.46	40.07	45.73	10.19	6.91	6.82		
	SCAV'ER2	10		500	50	34.8	11.0	C-3	14.23	1.23	41.87	47.98	11.61	16.45	16.30		
								Tail	57.52	1.17	32.27	37.87	44.63	51.25	52.02		
69	GRINDING	6	50	17500	150	46.4	9.9	C. Head	100.00	1.73	36.09	41.61	100.00	100.00	100.00		
	ROUGHER	10	20	1250	150	46.4	11.2	C-1	25.26	3.06	40.91	47.79	44.72	28.64	29.01		
	SCAV'ER1	10		500	50	11.6	11.3-10.8	C-2	7.52	2.32	39.83	45.17	10.10	8.30	8.17		
	SCAV'ER2	10		500	50	23.2	11.0	C-3	13.35	1.17	41.75	48.14	9.03	15.44	15.44		
								Tail	53.86	1.16	31.91	36.60	36.15	47.62	47.38		
70	GRINDING	11	50	18750	150	34.8	10.4	C. Head	100.00	1.67	35.86	41.16	100.00	100.00	100.00		
	ROUGHER	10	20	800	150	34.8	11.2	C-1	22.84	3.30	40.07	47.53	45.06	25.52	26.38		
	SCAV'ER1	10		500	50	23.2	11.3-10.8	C-2	7.58	2.21	40.67	45.08	10.01	8.60	8.30		
	SCAV'ER2	10		250	50	23.2	10.8	C-3	20.01	1.03	41.99	47.59	12.32	23.43	23.14		
								Tail	49.57	1.10	30.71	35.02	32.60	42.45	42.18		
71	GRINDING	16	50	20000	150	34.8	10.6	C. Head	100.00	1.62	36.45	42.41	100.00	100.00	100.00		
	ROUGHER	10	20	1175	150	34.8	11.4	C-1	21.66	3.31	41.51	48.62	44.20	24.67	24.83		
	SCAV'ER1	10		250	50	23.2	11.2-10.8	C-2	7.28	2.82	41.39	47.49	12.66	8.27	8.15		
	SCAV'ER2	10		500	50	34.8	10.8	C-3	25.02	1.03	42.95	50.12	15.89	29.48	29.57		
								Tail	46.04	0.96	29.75	34.50	27.25	37.58	37.45		

Table 23 Flotation Test Results of Rakah Massive Ore
- Effect of KAX dosage on copper selective flotation -

TEST No.	OPER ACTION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		D. Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T	pH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.	%						Initial	Final									
66	GRINDING	16	50		12500		200	46.4		11.0				1.63	37.17	41.56	100.00	100.00	100.00
	ROUGHER	10	20	94	5625				11.2				1.54	44.23	49.49	29.29	36.84	36.87	
	SCAV'ER1	5											3.17	42.43	47.07	9.18	5.38	5.34	
	SCAV'ER2	5			250			11.6		10.8			3.82	40.75	45.82	7.27	3.40	3.42	
	SCAV'ER3	10			250		50	11.6		10.9			1.97	42.67	48.38	17.41	16.51	16.74	
													1.28	30.05	33.38	36.85	37.87	37.63	
71	GRINDING	16	50		20000		150	34.8		11.4			1.62	36.45	42.41	100.00	100.00	100.00	
	ROUGHER	10	20	94	1175				11.2				3.31	41.51	48.62	44.20	24.67	24.83	
	SCAV'ER1	10			250					10.8			2.82	41.39	47.49	12.66	8.27	8.15	
	SCAV'ER2	10			500		50	34.8		10.8			1.03	42.95	50.12	15.89	29.48	29.57	
													0.96	29.75	34.50	27.25	37.56	37.45	
72	GRINDING	16	50		17500		100	46.4		11.0			1.61	36.54	41.91	100.00	100.00	100.00	
	ROUGHER	10	20	94	700				11.2				4.90	39.79	46.70	30.24	10.85	11.10	
	SCAV'ER1	5			250							3.93	39.79	45.75	12.57	5.62	5.64		
	SCAV'ER2	5			250		50	11.6		10.8		3.21	39.79	45.99	7.05	3.85	3.89		
	SCAV'ER3	10			250			23.2		10.9		1.52	42.19	48.69	18.36	22.51	22.65		
												0.83	33.78	38.43	31.78	57.15	56.72		
73	GRINDING	30	50		20000		100	34.8		11.0			1.64	36.77	41.73	100.00	100.00	100.00	
	ROUGHER	10	20	>99	900				11.2				4.29	39.78	44.91	19.98	8.27	8.23	
	SCAV'ER1	5										4.89	38.99	43.97	8.95	3.18	3.16		
	SCAV'ER2	5			250		20	11.6		10.8		4.53	38.39	44.14	5.80	2.19	2.22		
	SCAV'ER3	10			500			23.2		11.1		4.06	39.71	44.96	16.72	7.30	7.28		
												0.99	36.11	41.01	48.56	79.05	79.11		

Table 24 Flotation Test Results of Rakah Massive Ore
- Effect of KAX on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %					ASSAY					DISTRIBUTION				
		Time		P.D. Size %	Temp °C	Lime g/l	KAX g/l	AF35 g/l	PH		Au g/t		As g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %						
		min.	%						Initial	Final																	
74	GRINDING	16	50		15000			69.6	7.8	7.8	11.41	5.52	1.64	37.00	41.86	100.00	100.00	100.00	100.00	100.00							
	ROUGHER	20	20	94	725	100	23.2	7.8	7.8	13.34	5.07	2.01	42.05	48.27	47.71	31.74	50.10	46.37	47.65								
	SCAVEN-GER	10				50		23.2	7.8	7.8	12.23	4.10	1.14	43.05	48.57	42.07	24.68	27.33	45.66	45.53							
	Tail										5.84	14.23	1.85	14.77	15.56	10.22	43.58	22.56	7.97	7.42							
75	GRINDING	16	50		17500			58	9.3	9.3	10.28	4.23	1.62	36.67	42.02	100.00	100.00	100.00	100.00	100.00							
	ROUGHER	20	20	94		100		11.6	9.0	8.9	13.44	6.51	3.47	39.05	43.40	18.02	21.23	29.44	14.88	14.24							
	SCAVEN-GER	10				50		11.6	9.0	8.9	16.12	7.00	3.54	40.30	46.01	18.01	19.01	25.02	12.62	12.57							
	Tail										8.80	3.38	0.99	35.67	41.15	63.97	59.76	45.54	72.70	73.19							
76	GRINDING	16	50		20000			46.4	10.4	10.3	9.48	7.90	1.65	35.82	42.76	100.00	100.00	100.00	100.00	100.00							
	ROUGHER	10	20	94		100		11.6	10.3	10.2	13.77	5.89	3.83	38.59	47.77	26.28	13.48	41.98	19.99	20.20							
	SCAV'ER1	10				50		23.2	10.2	10.0	12.88	6.09	3.29	40.31	47.63	6.34	3.59	9.29	5.25	5.19							
	SCAV'ER2	10				50		23.2	10.2	10.0	9.64	3.16	1.29	42.47	50.60	17.59	6.91	13.51	20.50	20.45							
Tail										7.87	10.02	0.97	32.42	38.61	49.80	76.02	35.24	54.27	54.15								
72	GRINDING	16	50		17500			46.4	11.0		10.60	3.46	1.61	36.54	41.91	100.00	100.00	100.00	100.00	100.00							
	ROUGHER	10	20	94	700	100		11.6	11.0		18.38	6.54	4.90	39.79	46.70	17.27	18.82	30.24	10.85	11.10							
	SCAV'ER1	10			500	50		23.2	10.9		14.71	6.58	3.64	39.79	45.85	12.08	16.55	19.63	9.48	9.53							
	SCAV'ER2	10				50		23.2	10.9		10.93	3.61	1.52	42.19	48.69	20.10	20.33	18.36	22.51	22.55							
Tail										8.67	2.48	0.83	33.78	38.45	50.55	44.29	31.78	57.15	56.72								

Table 25 Flotation Test Results of Rakah Massive Ore
- Effect of AP3501 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS						PROD UCTS	WEIGHT %				ASSAY				DISTRIBUTION			
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	AF65 g/T		PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
77	GRINDING ROUGHER SCAVEN- GER	16	50			15000				11.67	4.48	1.66	36.50	42.07	100.00	100.00	100.00	100.00	100.00	
		20	20	94	29	575	69.6	7.5	7.7	14.08	3.86	2.04	41.55	48.22	53.96	38.57	55.03	50.80	51.28	
		10					34.8	7.7	7.7	11.31	2.65	1.12	42.43	48.98	33.68	20.58	23.48	40.31	40.48	
78	GRINDING ROUGHER SCAVEN- GER	16	50			15000				10.09	4.30	1.53	36.50	43.77	100.00	100.00	100.00	100.00	100.00	
		20	20	94	28	1975	69.6	9.4	9.3	18.54	4.74	2.28	41.67	49.67	25.30	20.46	25.92	21.16	21.04	
		10					46.4	9.3	9.1	13.77	5.09	2.37	41.93	51.06	26.19	27.20	27.88	22.04	22.38	
79	GRINDING ROUGHER SCAVEN- GER	16	50			17500				10.80	3.64	1.55	35.86	43.38	100.00	100.00	100.00	100.00	100.00	
		20	20	94	28	800	46.4	10.2	9.9	17.41	6.09	3.72	38.80	47.83	33.73	34.97	47.18	22.64	23.07	
		10					23.2	10.4	10.1	11.89	5.18	2.34	40.17	47.76	16.15	13.03	12.97	10.24	10.07	
80	GRINDING ROUGHER SCAVEN- GER	16	50			20000				8.67	2.71	0.94	34.42	41.48	56.12	52.00	39.84	67.12	66.86	
		20	20	94	29	1625	46.4	11.2	11.1	10.70	4.35	1.53	36.32	43.79	100.00	100.00	100.00	100.00	100.00	
		10					23.2	11.1	11.0	13.20	5.64	2.36	40.55	48.35	37.02	39.20	50.73	24.06	24.52	
81	GRINDING ROUGHER SCAV'ER1 SCAV'ER2	16	50			20000				6.53	2.98	1.62	35.98		100.00	100.00	100.00	100.00	100.00	
		20	20	94	31	1075	34.8	11.4		17.33	6.93	4.67	38.87		31.93	27.88	34.57	12.95		
		10					11.8	11.2	10.8	11.66	5.88	3.10	39.46		11.26	12.44	12.07	6.91		
		10				500	34.8	11.2	11.2	6.58	4.62	2.40	39.34		8.75	13.30	12.71	9.38		
		10								73.13	4.29	1.93	34.81		48.06	46.38	40.64	70.76		

Table 26 Flotation Test Results of Rakah Massive Ore
 - Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCIS	WEIGHT %	ASSAY					DISTRIBUTION				
		Timep. D.		Size %	Temp °C	Lime #/T	AP3418 #/T	AF65 #/T	PH		Au g/t			Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %	
		min.	%						Initial	Final													
82	GRINDING ROUGHER SCAVEN- GER	16	50	94	29	15000	154.6	46.4	7.4	7.6	10.90	3.56	1.65	35.85	42.22	100.00	100.00	100.00	100.00	100.00			
		20	20	94	29	500	154.6	46.4	7.4	7.6	12.32	3.14	1.78	42.55	48.58	56.59	43.05	34.07	57.92	57.84			
		10	20	94	29	48.3	12.14	2.65	1.41	41.55	48.41	28.45	18.50	21.81	28.80	29.30	14.86	38.44	24.12	13.28	12.86		
83	GRINDING ROUGHER SCAVEN- GER	16	50	94	28	15000	154.6	58	9.4	8.9	10.28	3.04	1.40	36.35	41.96	100.00	100.00	100.00	100.00	100.00			
		20	20	94	28	1375	154.6	58	9.4	8.9	11.40	3.81	2.20	41.80	48.44	31.12	33.32	44.13	32.28	32.40			
		10	20	94	28	48.3	12.69	3.84	1.95	41.55	48.30	22.15	22.56	29.01	20.51	20.55	46.73	44.03	30.87	47.21	45.95		
84	GRINDING ROUGHER SCAVEN- GER	16	50	94	29	17500	154.6	58	10.2	9.8	10.43	2.59	1.62	35.40	41.98	100.00	100.00	100.00	100.00	100.00			
		20	20	94	29	1325	154.6	58	10.2	9.8	17.42	3.84	3.70	39.42	45.45	29.70	25.37	40.53	19.81	19.26			
		10	20	94	29	48.3	13.16	3.61	2.53	39.92	46.18	14.17	15.06	17.51	12.57	12.36	55.13	59.57	41.96	67.52	68.38		
85	GRINDING ROUGHER SCAVEN- GER	16	50	94	30	20000	154.6	46.4	11.2	11.0	11.08	4.96	1.62	35.79	42.39	100.00	100.00	100.00	100.00	100.00			
		20	20	94	30	1500	154.6	46.4	11.2	11.0	16.86	5.64	3.16	40.30	48.74	41.91	31.28	53.81	31.01	31.66			
		10	20	94	30	48.3	12.14	4.51	1.86	40.30	48.50	11.27	9.34	11.96	11.58	11.76	46.82	59.38	34.23	57.41	56.58		
86	GRINDING ROUGHER SCAVEN- GER	16	50	94	30	20000	106.3	34.8	11.4	11.0	8.70	2.88	1.63	35.68	42.39	100.00	100.00	100.00	100.00	100.00			
		10	20	94	30	800	106.3	34.8	11.4	11.0	10.23	4.83	4.32	38.15	48.74	17.21	24.56	38.76	15.64	15.64			
		10	20	94	30	250	48.3	34.8	11.2	11.0	8.88	4.83	2.62	39.11	48.74	8.03	10.78	11.11	7.04	7.04			
	SCAVEN- GER	10	20	94	30	250	48.3	34.8	11.2	11.0	6.58	4.41	2.12	39.82	48.74	6.62	13.42	11.38	9.77	9.77			
		10	20	94	30	250	48.3	34.8	11.2	11.0	8.44	2.10	0.90	34.34	48.74	68.13	51.24	38.75	67.55	67.55			

Table 27. Flotation Test Results of Rakah Massive Ore
- Effect of AP404 on copper selective flotation varying pH value -

TEST No.	OPERATION	CONDITIONS										PROD UCIS	WEIGHT %	ASSAY					DISTRIBUTION				
		Time		Lime	AF404	AF65	pH		Au	Ag	Cu			Fe	S	Au	Ag	Cu	Fe	S			
		min.	%				Size	temp													g/T	g/T	Initial
87	GRINDING	16	50	15000	154.6	46.4	7.2	7.5	10.43	4.29	1.52	35.96	41.97	100.00	100.00	100.00	100.00	100.00					
	ROUGHER	20	20	48.3	48.3	23.2	7.5	7.6	12.51	6.27	3.25	39.80	45.51	17.99	21.40	30.02	16.15	16.26					
	SCAVENGER	10					7.5		15.66	6.76	3.16	40.30	46.15	8.89	9.11	11.52	6.45	6.51					
88	GRINDING	16	50	15000	154.6	58	9.3	8.9	11.71	3.90	1.52	36.68	41.78	100.00	100.00	100.00	100.00	100.00					
	ROUGHER	20	20	48.3	48.3	23.2	9.4	8.9	14.83	6.03	3.44	39.67	44.44	14.27	17.43	23.88	12.19	11.99					
	SCAVENGER	10					8.9		17.33	6.27	3.34	40.30	46.30	11.28	12.26	15.68	8.38	8.45					
89	GRINDING	16	50	20000	154.6	46.4	11.2	10.8	11.60	2.45	1.61	37.05	41.99	100.00	100.00	100.00	100.00	100.00					
	ROUGHER	20	20	48.3	48.3	23.2	11.2	10.9	17.42	4.96	4.34	38.92	44.64	21.44	28.88	38.59	15.00	15.18					
	SCAVENGER	10					10.9		17.79	4.29	3.67	38.92	46.07	11.91	13.58	17.74	8.37	8.52					
90	GRINDING	16	50	20000	106.3	34.8	11.4		5.40	3.47	1.60	35.45		100.00	100.00	100.00	100.00	100.00					
	ROUGHER	10	20	48.3	48.3	23.2	11.2	10.8	4.83	4.83	4.08	37.20		15.13	6.66	12.15	5.01						
	SCAVENGER	10					11.0		13.53	5.86	3.97	35.77		5.42	5.35	5.35	2.18						
90	GRINDING	16	50	20000	106.3	34.8	11.4		5.40	3.47	1.60	35.45		100.00	100.00	100.00	100.00	100.00					
	ROUGHER	10	20	48.3	48.3	23.2	11.2	11.0	11.16	5.51	5.61	38.99		10.88	9.89	18.43	5.71						
	SCAVENGER	10					11.0		4.22	3.15	1.17	35.17		66.58	79.78	84.06	87.10						

Table 28 Flotation Test Results of Rakah Massive Ore
 - Recovery as a function of flotation time on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS				KAX g/T	AF65 g/T	PH		PROD UCTS	WEIGHT %	ASSAY				DISTRIBUTION				
		Time min.	P.D. %	Size %	Temp °C			Lime g/T	Initial			Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %
91	GRINDING ROUGHER	16	50	94	32	20000	100	34.8	11.3	C-Head	100.00	8.03	5.89	1.63	35.74	41.47	100.00	100.00	100.00	100.00
		10	20			1100		11.5		C-1	9.02	10.33	7.35	4.89	38.03	44.58	11.89	11.25	27.00	3.50
		2	10			500		23.2		C-2	4.34	15.10	6.51	5.05	37.19	43.26	8.16	4.79	13.42	4.52
		3	10			250	20	23.2	11.4	C-3	6.09	14.24	4.20	3.67	38.87	44.79	10.80	4.34	13.68	6.67
		4	10			250	20	23.2	10.8	C-4	5.01	7.23	3.78	2.57	40.07	44.90	4.51	3.21	7.88	5.61
		5	10			250	20	11.6		C-5	5.38	4.37	2.73	1.78	39.83	45.87	2.93	2.49	5.85	6.00
		6	10			500	20	11.6		C-6	5.39	4.79	2.52	1.33	40.91	47.06	3.21	2.30	4.38	6.16
		7	10			250	20	11.6		C-7	9.86	4.37	2.10	0.76	42.59	49.32	5.36	3.51	4.59	11.75
8	10			500	50	34.8	11.0	C-8	24.99	9.56	1.68	0.45	43.55	50.72	30.05	7.12	6.88	30.45		
								Tail	29.93	6.20	12.01	0.89	23.04	26.88	23.10	60.98	16.31	18.29	19.40	

Table 29 Flotation Test Results of Rakah Massive Ore
- Effect of feed size and pH value on bulk flotation -

TEST No.	OPERATION	CONDITIONS				PROD UCITS	WEIGHT %	ASSAY				DISTRIBUTION							
		Temp min.	D-Size %	Lime g/T	KAX g/T			AF65 g/T	pH Initial	pH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %
92	GRINDING	4.5	50	12500	250	69.6	8.3	8.0	C. Head	100.00	5.43	1.62	36.68	42.29	100.00	100.00	100.00	100.00	100.00
	ROUGHER	20	50	2900	50	34.8	8.0	8.0	C-1	72.80	3.86	1.59	42.43	49.02	78.94	51.79	71.62	84.22	84.38
	SCAVENGER	10							C-2	7.47	5.07	2.10	36.17	41.12	9.39	6.38	9.71	7.37	7.28
								Tail	19.73	11.34	1.53	15.64	17.91	11.67	41.23	18.67	8.41	8.35	
93	GRINDING	4.5	50	15000	250	69.6	9.2	9.0	C. Head	100.00	5.89	1.57	36.34	42.76	100.00	100.00	100.00	100.00	100.00
	ROUGHER	20	50	2125	50	23.2	9.0	8.8	C-1	67.10	3.62	1.63	41.67	49.08	77.00	41.23	69.61	76.34	77.01
	SCAVENGER	10							C-2	8.12	4.34	1.70	38.67	44.51	6.99	5.98	8.79	8.64	8.45
								Tail	24.78	12.55	1.37	21.15	23.09	16.01	52.79	21.61	14.42	14.54	
94	GRINDING	8.5	50	15000	250	69.6	8.0	8.0	C. Head	100.00	5.37	1.61	36.39	42.71	100.00	100.00	100.00	100.00	100.00
	ROUGHER	20	70	575	50	34.8	8.0	7.8	C-1	76.35	4.83	1.35	41.33	49.44	83.39	68.68	73.73	87.97	88.38
	SCAVENGER	10							C-2	8.14	4.58	1.79	35.67	40.39	9.43	6.94	9.08	7.98	7.70
								Tail	15.51	8.44	1.78	9.51	10.80	7.19	24.38	17.20	4.05	3.92	
95	GRINDING	8.5	50	15000	250	69.6	9.3	9.4	C. Head	100.00	5.32	1.57	36.96	42.53	100.00	100.00	100.00	100.00	100.00
	ROUGHER	20	70	1475	50	23.2	9.4	8.9	C-1	65.98	4.58	1.74	42.18	48.91	73.92	56.49	72.50	74.85	75.42
	SCAVENGER	10							C-2	17.41	3.86	1.07	40.17	45.33	18.79	12.64	11.84	18.93	18.56
								Tail	17.01	9.85	1.45	13.52	15.04	7.28	30.87	15.67	6.22	6.01	

Table 30 Flotation Test Results of Rakah Massive Ore
- Effect of pH value on bulk rougher/cleaner flotation -

TEST No.	OPER ATION	CONDITIONS					PROD UCTS	WEIGHT %	ASSAY				DISTRIBUTION													
		Time min.	D.S. %	Temp °C	Lime g/t	KAX g/t			AF65 g/t	PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %					
96	GRINDING	5	50	31	15000	300	127.6	9.1	8.8	C. Head	100.00	5.15	4.45	1.60	36.17	41.37	100.00	100.00	100.00	100.00	41.37	100.00	100.00	100.00	100.00	
	ROUGHER	30	20	31	4375	300	127.6	9.1	8.8	R-C	84.61	5.50	3.66	1.65	41.22	47.38	90.49	69.53	87.32	87.32	47.38	90.49	69.53	87.32	87.32	
	REGREIND- INC	11								1C-C	27.33	6.59	4.07	2.24	41.81	50.01	34.99	25.02	38.24	38.24	50.01	34.99	25.02	38.24	31.59	33.04
	1CLEANER	7	18	29	4475	4	29.2	12.2	12.0	1C-M	57.28	4.99	3.46	1.37	40.94	46.12	55.50	44.51	49.08	49.08	46.12	55.50	44.51	49.08	64.84	63.87
	2CLEANER	10	17	26	3000	4	11.6	12.0	12.3	1CS-I	46.24	4.46	3.01	1.07	40.83	45.63	40.08	31.29	18.19	18.19	45.63	40.08	31.29	30.89	52.20	51.01
	3CLEANER	5	9	26	2000			12.3	12.3	2C-C	10.33	8.84	5.43	3.76	40.47	49.61	17.74	12.60	24.23	24.23	49.61	17.74	12.60	24.23	11.55	12.38
		4	9	26	2000			12.3	12.3	2C-M	17.00	5.22	3.25	1.32	42.63	50.25	17.25	12.42	14.01	14.01	50.25	17.25	12.42	14.01	20.04	20.66
										Conc	4.98	11.27	6.03	5.14	39.71	49.33	10.91	6.75	15.99	15.99	49.33	10.91	6.75	15.99	5.47	5.94
										3C-M	5.34	6.58	4.87	2.47	41.17	49.87	6.83	5.85	8.24	8.24	49.87	6.83	5.85	8.24	6.08	6.44
										Tail	15.39	3.18	3.81	1.32	8.38	8.32	9.51	30.47	12.68	12.68	8.32	9.51	30.47	12.68	3.56	3.09

Table 32 Flotation Test Results of Rakah Massive Ore
 - Effect of mixing ratio of Rakah massive ore on bulk flotation of composite ore -

TEST No.	OPER ATION	CONDITIONS						PROD UCITS	WEIGHT %				ASSAY				DISTRIBUTION			
		R* %	Time P.D. min.	Size %	Lime g/T	KAX g/T	AF65 g/T		PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
99	GRINDING		9	60				C. Head	100.00											
	ROUGHER	0	15	35	2200	35	37.2	11.4	29.60	1.25	3.96	17.03	100.00	99.96	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.4	2.67	0.78	35.29	30.64	10.03	1.67	3.35	3.39	6.95	8.88	5.48	
	SCAV'ER2		10		400	5	18.6	11.1	3.52	0.61	15.64	29.14	6.76	1.23	2.32	2.28	4.53	5.48	3.83	
100	GRINDING		9	60				C. Head	100.00											
	ROUGHER	5	15	35	2900	45	37.2	11.4	28.39	2.00	3.80	17.56	100.00	99.95	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.3	4.23	6.72	29.03	30.64	10.03	1.67	3.35	3.39	6.95	8.88	5.48	
	SCAV'ER2		10		200	5	18.6	11.1	3.55	6.30	22.03	29.14	6.76	1.23	2.32	2.28	4.53	5.48	3.83	
101	GRINDING		9	60				C. Head	100.00											
	ROUGHER	10	15	35	3820	50	37.2	11.4	31.53	1.48	2.10	18.34	100.00	99.95	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.4	2.11	3.51	35.92	42.21	74.59	3.65	4.58	3.65	5.35	6.01	5.63	
	SCAV'ER2		10		200	5	18.6	11.0	4.03	3.65	24.40	23.58	9.91	14.82	3.28	5.35	5.35	6.01	5.63	
102	GRINDING		9	60				C. Head	100.00											
	ROUGHER	20	15	35	5240	80	27.9	11.4	38.51	1.80	2.44	20.51	100.00	99.95	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.4	1.58	3.51	19.02	18.64	3.07	4.49	3.78	1.47	1.21	1.21	1.21	
	SCAV'ER2		10		200	5	18.6	11.0	1.95	3.44	18.90	13.47	3.71	6.77	2.93	1.79	1.38	1.38	1.38	
103	GRINDING		9	60				C. Head	100.00											
	ROUGHER	30	15	35	6800	110	27.9	11.4	42.78	3.28	3.12	22.85	100.00	99.95	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.2	1.59	5.87	21.28	19.00	2.85	8.13	5.15	1.49	1.39	1.39	1.39	
	SCAV'ER2		10		200	5	18.6	10.8	2.05	4.94	20.02	15.78	3.08	8.26	4.08	1.79	1.48	1.48	1.48	
104	GRINDING		9	60				C. Head	100.00											
	ROUGHER	40	15	35	7600	110	27.9	11.4	43.47	5.08	3.69	24.65	100.00	99.95	100.00	100.00	100.00	100.00	100.00	
	SCAV'ER1		5		200	5	9.3	11.2	1.85	8.66	24.58	24.31	3.15	4.15	7.51	1.84	1.78	1.78	1.78	
	SCAV'ER2		10		200	5	18.6	10.8	2.32	6.87	23.78	22.16	3.13	4.03	3.51	2.23	2.04	2.04	2.04	

the composite ore was prepared by mixing Hayli as Safil ore with Rakah stockwork ore in the ratio 1.85 to 1.
 R* : Percent of Rakah massive ore

Table 33 Flotation Test Results of Composite Ore
- Bulk and copper selective rougher/cleaner flotation -

TEST No.	OPER ACTION	CONDITIONS				PROD UCIS	WEIGHTI %	ASSAY					DISTRIBUTION										
		TimeP min.	D. Size %	Temp °C	Lime g/l			KAX g/l	AF65 g/l	PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Zn %	Fe %	S %	Au %	Ag %	Cu %	Zn %	Fe %	S %
105	GRINDING	9	50	32	2800	50	93	11.4	10.5	0.48	3.16	1.17	0.24	16.81	13.12	100	100	100	100	100	100	100	100
	ROUGHER	30	35		1000			12.2	12.2	1.12	7.38	2.83	0.53	29.64	31.60	93.82	94.54	97.45	87.80	71.36	97.46	97.46	
	REGROUND	7.5								0.05	0.29	0.05	0.05	8.09	0.56	6.18	5.46	2.54	12.20	28.64	2.54	2.54	
	CLEANING OF									3.56	21.08	13.39	2.32	32.67	38.71	54.92	49.58	84.80	70.76	14.44	21.91	14.44	
	1-CL'ER	15	21	95	1700		27.9	12.8	12.6	0.57	4.30	0.45	0.13	28.96	30.00	38.90	44.06	12.65	17.04	56.92	75.55	75.55	
	1CL-SCA	10	18			6	18.6	12.6	12.6	1.02	1.14	6.26	2.59	36.78	41.05	4.79	4.01	4.47	4.32	4.43	6.33	6.33	
	2-CL'ER	13	14				4.7	12.8	12.8	0.53	4.17	0.31	0.10	28.45	29.28	34.12	40.95	8.20	12.72	52.50	68.22	68.22	
	3-CL'ER	13	13					12.8	12.8	4.06	23.68	15.83	2.73	32.40	39.44	51.08	45.48	81.88	67.85	11.59	18.24	18.24	
	4-CL'ER	12	12					12.8	12.8	1.36	9.51	2.51	0.52	33.86	35.42	3.84	4.10	2.91	2.91	2.74	3.68	3.68	
	5-CL'ER	12	11					12.8	12.8	4.37	24.81	7.41	3.00	31.87	39.40	48.08	41.68	78.3	65.26	10.65	15.93	15.93	
6-CL'ER	11	10					12.8	12.8	1.89	15.77	4.87	0.83	36.05	39.78	2.98	3.80	3.16	2.59	1.63	2.31	2.31		
BULK	4C-M								4.83	4.69	25.74	18.45	3.20	31.48	39.21	47.06	39.39	76.03	63.46	9.05	14.45	14.45	
	5C-C								4.49	4.91	25.86	19.18	3.35	31.26	39.09	45.76	36.77	73.40	61.72	8.35	13.38	13.38	
	5C-M								0.34	1.82	24.12	8.96	1.24	34.35	40.77	1.30	2.63	2.83	1.75	0.70	1.07	1.07	
	CONC								4.11	5.20	25.94	18.95	3.52	31.06	38.97	44.30	33.12	69.82	59.27	7.59	12.19	12.19	
	6C-M								1.82	25.05	10.93	1.55	33.37	40.40	1.45	3.05	3.58	2.43	0.76	1.18	1.18	1.18	
	TTL-C								4.11	5.20	25.94	19.95	3.52	31.06	38.97	44.30	33.72	59.82	59.27	7.58	12.19	12.19	
	TTL-M								5.35	1.39	11.74	4.27	0.72	35.46	39.39	15.40	19.87	19.45	15.80	11.28	16.05	16.05	
	TTL-I								90.55	0.21	1.62	0.14	0.07	15.07	10.40	40.29	46.41	10.73	24.93	81.14	71.76	71.76	
	106	GRINDING	16	60	31	3120	45	65.1	11.6	11.9	0.53	2.77	1.26	0.28	17.33	13.01	100	100	100	100	100	100	100
		ROUGHER	30	35		1000					1.85	9.99	5.80	1.01	35.20	38.15	67.82	69.85	89.07	70.71	39.16	56.52	56.52
REGROUND		4								0.21	1.04	0.17	0.10	13.06	7.01	32.18	30.35	10.93	29.29	60.84	43.48	43.48	
CLEANING OF										3.12	14.62	14.09	2.58	34.31	39.92	37.82	33.75	71.67	59.82	12.64	19.59	19.59	
1-CL'ER		15	20	95	500		9.3	12.8	12.8	1.23	7.70	1.69	0.28	35.64	37.28	30.00	35.50	17.40	10.89	26.52	36.93	36.93	
1CL-SCA		10	15			1	9.3	12.8	12.8	2.50	1.97	8.28	0.83	34.23	38.81	6.66	6.07	8.5	4.22	2.77	4.18	4.18	
2-CL'ER		13	14					12.8	12.8	1.07	17.18	0.89	0.16	35.81	37.09	23.34	29.83	8.14	6.67	23.74	32.75	32.75	
3-CL'ER		13	11					12.8	12.8	3.70	17.37	17.84	3.27	32.50	38.86	34.10	30.49	68.99	57.54	9.10	14.49	14.49	
4-CL'ER		12	9					12.8	12.8	1.28	5.88	2.20	0.41	40.07	43.27	3.72	3.26	2.88	2.28	3.54	5.09	5.09	
5-CL'ER		11	8					12.8	12.8	4.07	18.86	20.24	3.72	31.23	37.94	31.88	28.14	66.55	55.65	7.44	12.63	12.63	
6-CL'ER	10	7					12.8	12.8	4.37	19.93	21.90	4.08	30.52	37.37	29.86	25.93	62.76	53.27	6.34	10.33	10.33		
STRAIGHT	4C-M								2.01	11.59	9.01	1.24	36.05	41.84	2.22	2.35	2.44	1.90	1.68	2.46	2.46	2.46	
	5C-C								3.15	19.15	22.96	4.40	30.11	36.86	27.44	21.80	57.39	50.22	5.47	8.94	8.94		
	5C-M								2.82	25.25	14.36	1.86	33.37	40.20	2.42	4.13	5.17	3.05	0.87	1.40	1.40		
	CONC								2.77	18.51	23.68	4.66	29.95	36.88	25.03	18.54	52.24	46.83	4.79	7.85	7.85		
	6C-M								3.29	23.95	17.82	2.48	31.18	37.57	2.35	3.25	5.35	3.39	0.68	1.09	1.09		
	TTL-C								2.77	18.51	23.68	4.66	29.95	36.88	25.08	18.54	52.24	46.83	4.79	7.85	7.85		
	TTL-M								5.02	2.04	11.73	7.18	0.95	36.69	41.28	19.39	21.28	28.69	17.22	10.63	15.92	15.92	
	TTL-I								92.21	0.32	1.81	0.26	0.11	15.89	10.76	55.52	60.18	19.07	35.95	84.58	76.23	76.23	

Table 34 Flotation Test Results of Composite Ore
- Scalp rougher/cleaner flotation -

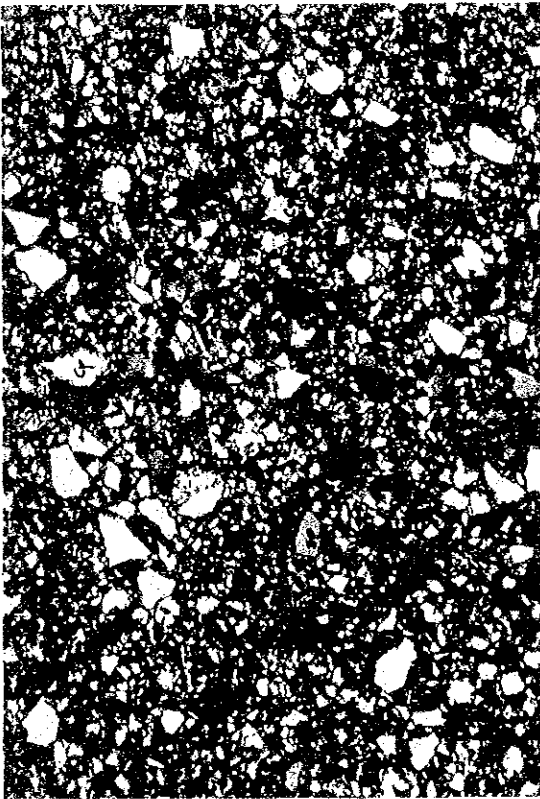
TEST No.	OPER AIGN	CONDITIONS				PH Initial/Final	PROD UCITS	WEIGHT %	ASSAY					DISTRIBUTION						
		Timep. min.	D. Size %	Temp °C	Lime g/T				col or	AF65 g/T	Au g/t	Ag g/t	Cu %	Zn %	Fe %	S %	Au %	Ag %	Cu %	Zn %
107	GRINDING ROUGHER	15	50	31	2000	AP3501	100.00	0.49	2.57	1.15	0.24	15.75	13.34	100	100	100	100	100	100	100
		5	35		1100	46.7	16.78	1.87	9.72	6.47	1.16	30.32	34.08	62.37	63.43	94.22	82.41	30.56	42.86	12.86
		25			600	KAX	83.22	0.22	1.13	0.08	0.05	13.98	9.16	37.63	36.57	5.78	17.59	19.44	57.14	17.14
	ROUGHER-SCALER	15	50	31	2000	AP3501	100.00	0.49	2.57	1.15	0.24	15.75	13.34	100	100	100	100	100	100	100
		5	35		1100	46.7	16.78	1.87	9.72	6.47	1.16	30.32	34.08	62.37	63.43	94.22	82.41	30.56	42.86	12.86
		25			600	KAX	83.22	0.22	1.13	0.08	0.05	13.98	9.16	37.63	36.57	5.78	17.59	19.44	57.14	17.14
	CLEANING OF	1ST ROUGHER	15	50	31	2000	AP3501	100.00	0.49	2.57	1.15	0.24	15.75	13.34	100	100	100	100	100	100
		1-CL'ER	9	25	25	800		8.25	0.74	5.88	1.00	0.21	33.62	37.85	3.17	2.60	3.14	2.10	1.92	2.72
		2-CL'ER	8	24	24	600		3.45	2.81	14.13	10.14	1.56	32.78	29.75	19.89	18.95	30.36	22.77	6.75	10.27
		3-CL'ER	6	24	24	450		1.18	1.24	7.84	2.98	0.52	32.76	35.57	3.26	3.51	2.06	2.60	2.32	3.15
		4-CL'ER	5	25	25	500		2.80	3.03	15.48	11.33	0.73	32.62	39.94	17.56	16.86	27.55	20.50	5.45	8.38
		5-CL'ER	5	23	23	500		2.22	3.28	15.89	12.53	1.91	32.39	39.85	14.82	14.39	24.10	17.93	4.28	6.62
SCA LP	REGRAIND	3.5			1000		0.58	3.84	18.97	14.73	2.04	33.50	40.25	2.74	2.48	3.46	2.57	1.17	1.76	
	CLEANING OF	2ND ROUGHER	15	50	31	2000	AP3501	100.00	0.49	2.57	1.15	15.75	13.34	100	100	100	100	100	100	
	1-CL'ER	15	25	25	200		1.53	1.88	12.85	7.76	1.55	31.86	40.64	12.01	2.91	3.93	3.82	1.18	1.78	
	1CL-SCA	10	14	14	400		1.21	4.30	18.39	15.98	2.07	31.42	39.06	10.72	8.63	16.83	10.62	2.28	3.55	
	2-CL'ER	14	25	25	400		0.42	2.12	7.42	9.16	1.97	33.13	41.06	2.09	2.84	3.34	3.50	0.83	1.29	
	3-CL'ER	13	24	24	400		4.15	4.01	17.36	18.67	3.32	29.87	38.32	34.23	28.05	67.33	58.23	7.41	11.93	
108	GRINDING ROUGHER	16	60	29	2000	AP3501	100.00	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100	100	
		2	35		960	46.7	14.66	2.22	10.35	7.40	1.28	31.95	34.81	57.63	59.54	92.71	81.53	27.50	38.38	
		28			500	KAX	85.94	0.28	1.22	0.10	0.05	14.47	9.62	42.37	40.46	7.29	18.47	72.50	61.92	17.91
	ROUGHER-SCALER	15	50	31	2000	AP3501	100.00	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100	100	
		5	35		1100	46.7	14.66	2.22	10.35	7.40	1.28	31.95	34.81	57.63	59.54	92.71	81.53	27.50	38.38	
		28			500	KAX	85.94	0.28	1.22	0.10	0.05	14.47	9.62	42.37	40.46	7.29	18.47	72.50	61.92	17.91
	CLEANING OF	1ST ROUGHER	15	50	31	2000	AP3501	100.00	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100	100
		1-CL'ER	2	23	23	500		6.21	3.19	13.88	12.93	1.99	33.11	38.32	35.12	32.76	63.85	53.52	12.07	17.89
		2-CL'ER	2	23	23	500		7.38	1.14	7.03	1.27	0.24	31.28	31.68	14.97	20.14	8.02	7.75	13.55	17.57
		3-CL'ER	1.5	23	23	450		6.59	2.26	8.36	4.00	0.52	35.20	38.57	13.16	2.84	2.67	1.76	5.1	2.26
		REGRAIND	3.5			1000		5.18	3.45	14.46	13.77	2.28	32.77	38.73	11.81	17.30	5.35	5.00	1.93	15.31
		CLEANING OF	2ND ROUGHER	15	50	31	2000	AP3501	100.00	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100
SCA LP	1-CL'ER	15	26	26	500		4.65	3.61	15.10	14.89	2.49	32.46	38.74	29.73	27.26	59.14	50.01	8.86	13.54	
	1CL-SCA	10	14	14	400		0.54	2.08	8.93	4.14	0.52	35.44	38.64	1.98	1.87	1.90	1.21	1.12	1.56	
	2-CL'ER	13	24	24	400		4.20	3.76	15.61	15.44	2.65	32.18	38.63	28.02	25.49	56.49	46.21	7.94	12.20	
	3-CL'ER	11	24	24	400		3.73	2.93	16.30	16.73	2.83	32.12	37.87	26.02	23.51	53.41	45.71	7.04	10.88	
	4-CL'ER	9	24	24	800		1.33	4.56	16.98	19.88	1.24	32.54	37.87	22.00	19.7	3.06	2.50	0.89	1.33	
	5-CL'ER	9	24	24	800		2.40	3.58	15.77	15.10	2.44	32.51	39.08	10.76	8.79	22.39	20.29	2.46	3.81	
6CL-SV1 6CL-SV2	1-CL'ER	1	24	24	500		1.20	3.83	16.55	17.83	1.99	32.16	38.90	8.14	7.71	17.81	15.05	2.26	3.51	
	1CL-SCA	2	23	23	500		0.89	3.47	14.5	13.77	2.07	33.37	35.78	5.40	4.90	10.48	7.98	1.74	2.66	
	2-CL'ER	2	23	23	500		0.31	3.09	17.42	10.18	1.76	31.42	37.79	2.12	2.12	2.73	2.39	0.58	0.89	
	REGRAIND	3.5			1000		4.50	4.00	16.04	18.61	3.27	31.63	38.14	31.85	28.03	71.51	63.57	8.35	12.90	
	CLEANING OF	2ND ROUGHER	15	50	31	2000	AP3501	100.00	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100	100
	1-CL'ER	15	26	26	500		3.57	2.21	10.35	5.19	0.77	34.45	37.89	13.97	14.21	15.84	11.96	7.22	10.17	

* TIL-C of Test No.108 = Conc.1 + Conc.2 + 6CSI-C + 6CS2-C

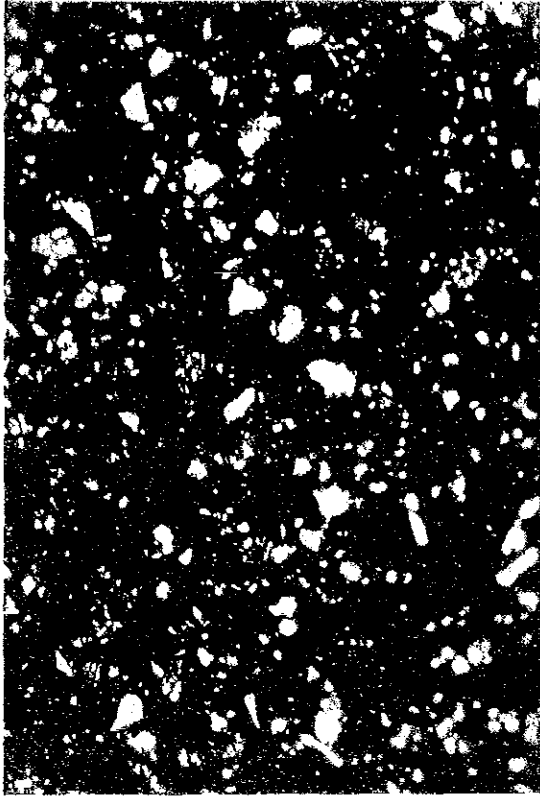
Appendix 7

SEM and microprobe images of test samples

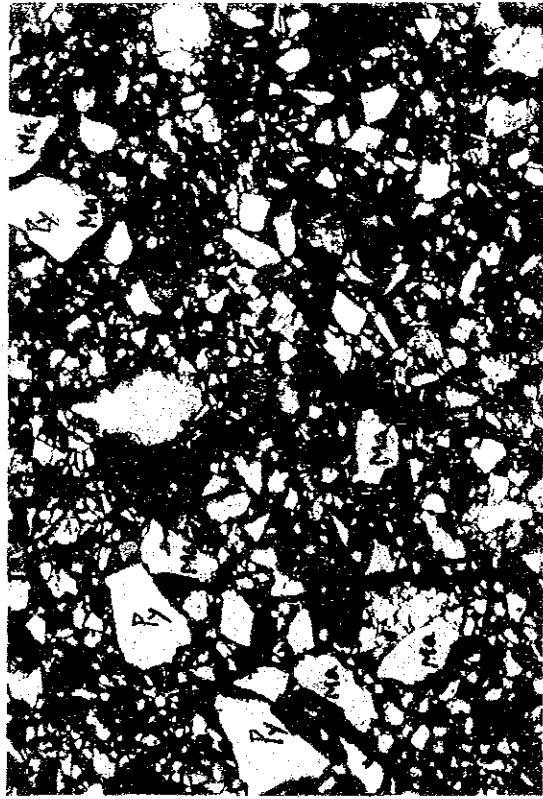
Photomicrograph 1. Flotation products of Rakah massive ore



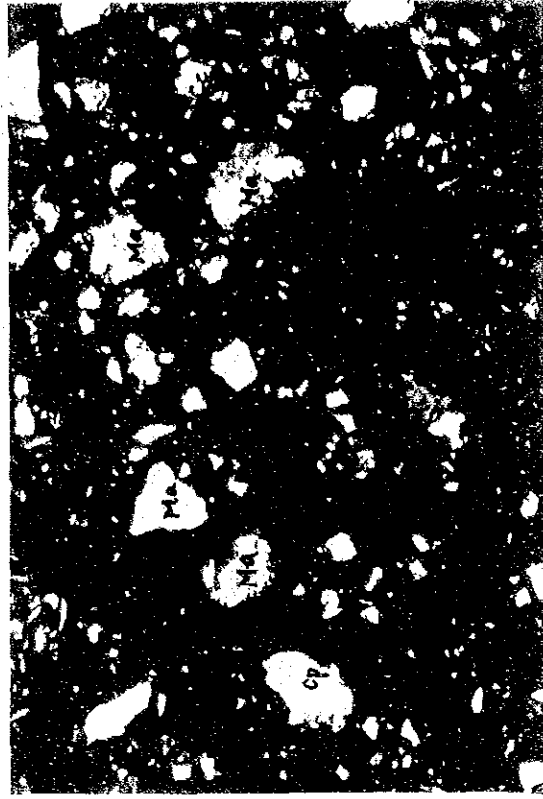
10 min. Product (magnification: X 175, 100 μ m)



30 min. Product (magnification: X 175, 100 μ m)

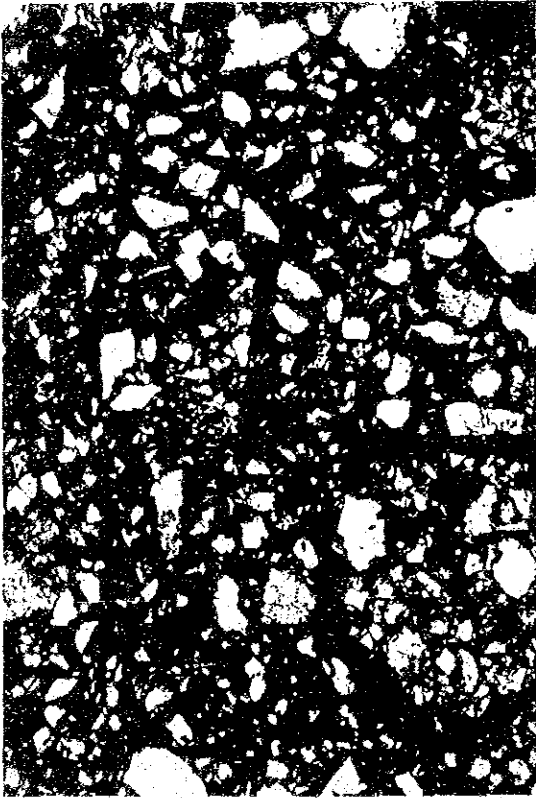


10 min. Product (magnification: X 350, 50 μ m)



30 min. Product (magnification: X 350, 50 μ m)

Photomicrograph 2 Flotation products of Rakah massive ore



50 min. Product (magnification: X 175, 100 μm)



80 min. Product (magnification: X 175, 100 μm)

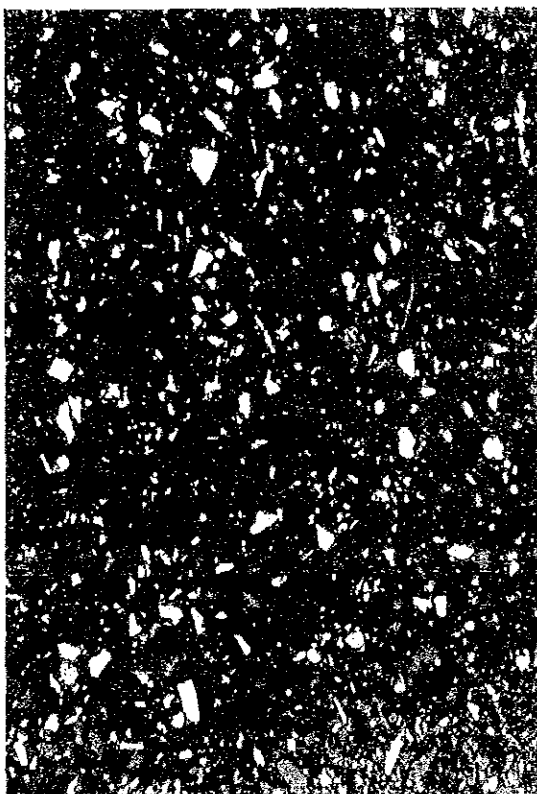


50 min. Product (magnification: X 350, 50 μm)



80 min. Product (magnification: X 350, 50 μm)

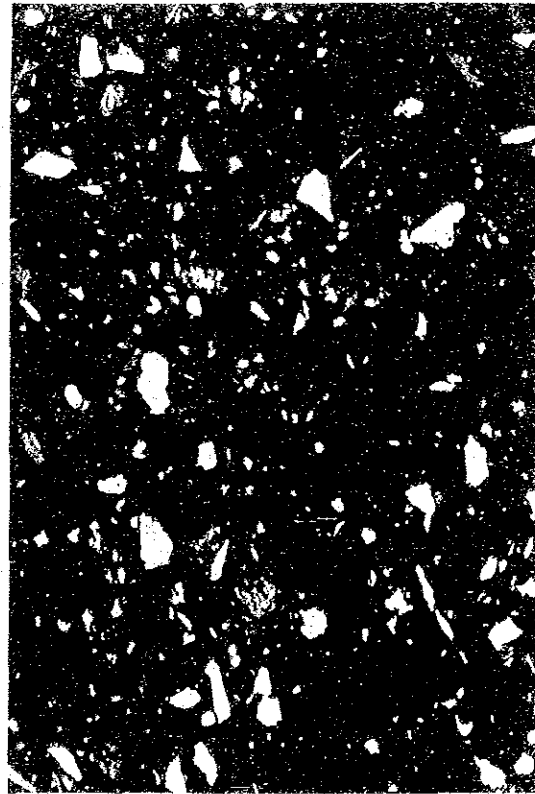
Photomicrograph 3 Flotation products of Rakah massive ore



tailing (magnification: X 175, 100 μ m)



tailing (magnification: X 175, 100 μ m)



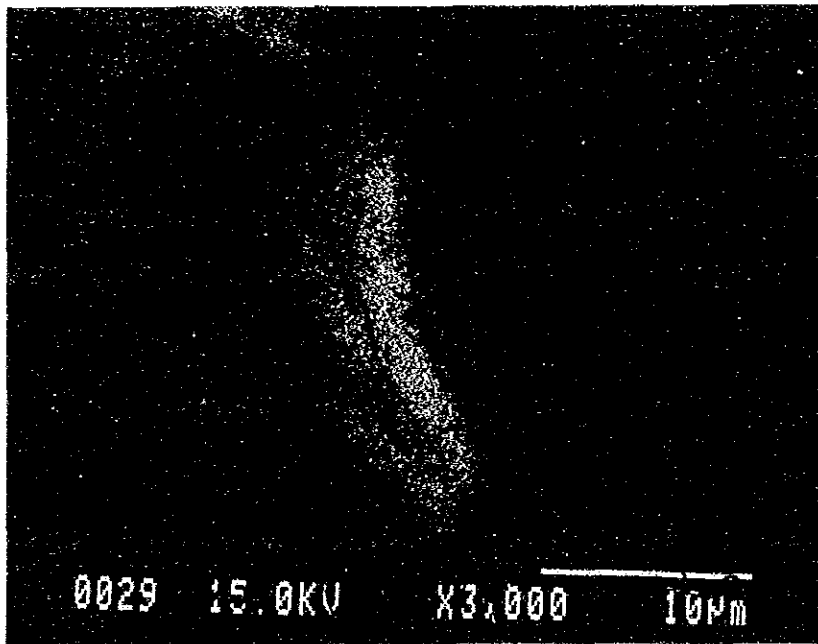
tailing (magnification: X 350, 50 μ m)

X-ray image of tailing by EPMA analysis



Back scattered electron image

X-ray images of tailing by EPMA analysis



Cu Kα X-ray Image



Si Kα X-ray Image

Appendix 8

Drawings of proposed mineral processing plant

- Fig. 1** General layout of mineral processing plant
- Fig. 2** General arrangement of primary crushing plant
- Fig. 3** General arrangement of secondary & tertiary crushing plant
- Fig. 4** General arrangement of fine ore stockpile
- Fig. 5** General arrangement of fine ore stockpile and ball mill
- Fig. 6** General arrangement of ball mill & flotation plant
- Fig. 7** General arrangement of filter plant & concentrate stockyard
- Fig. 8** General arrangement of tailing thickener



Fig.1 General layout of mineral processing plant

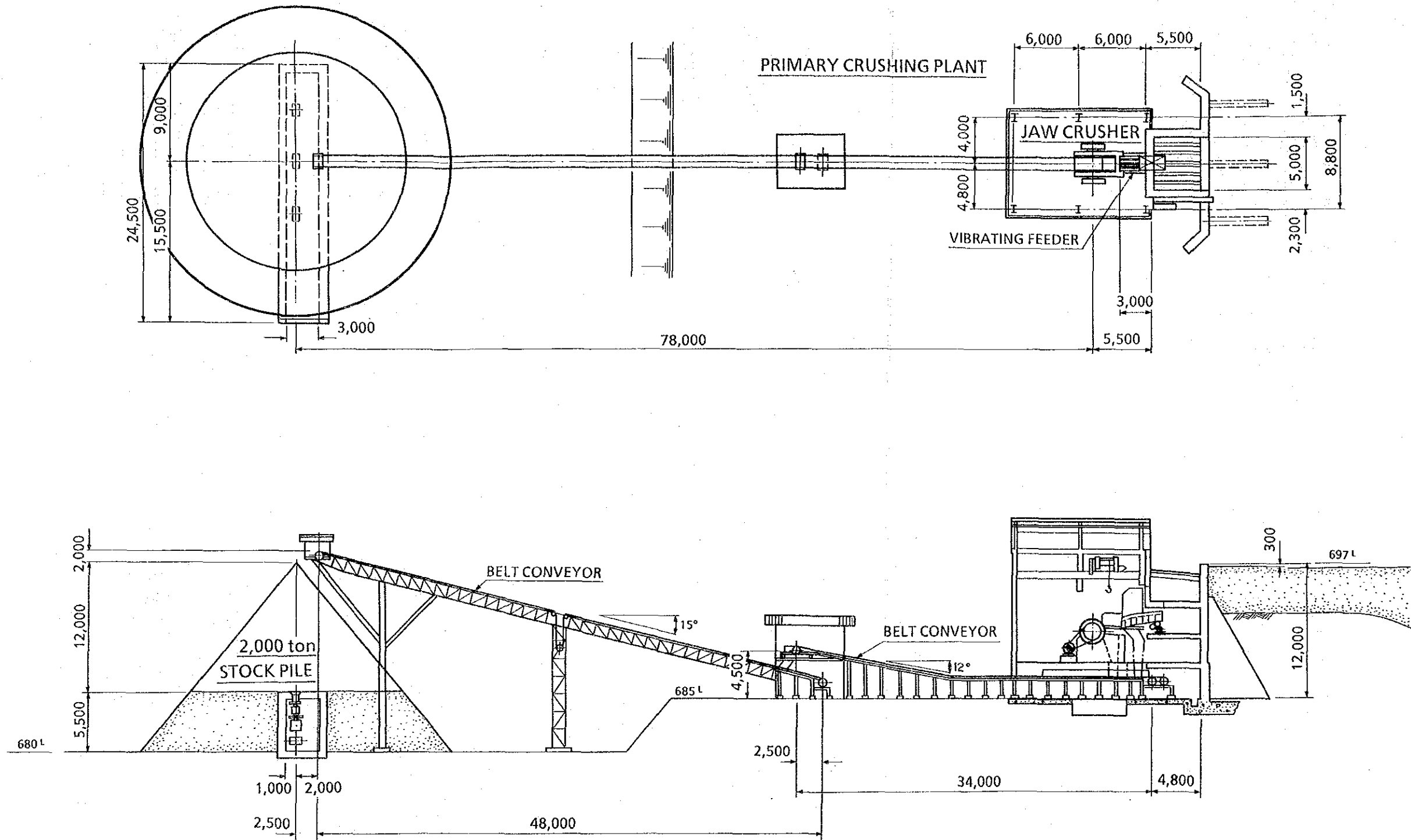


Fig. 2 General arrangement of primary crushing plant

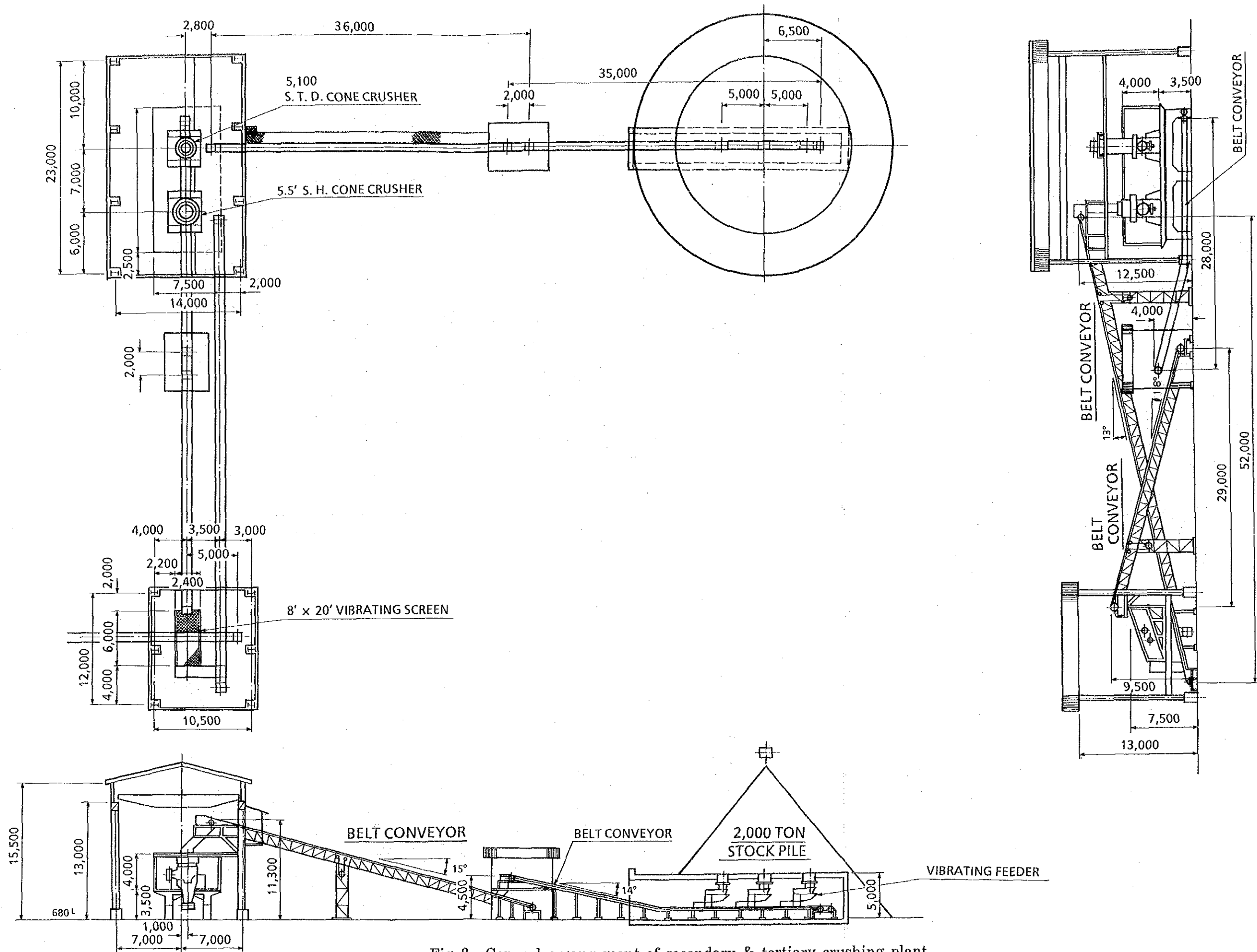


Fig. 3 General arrangement of secondary & tertiary crushing plant

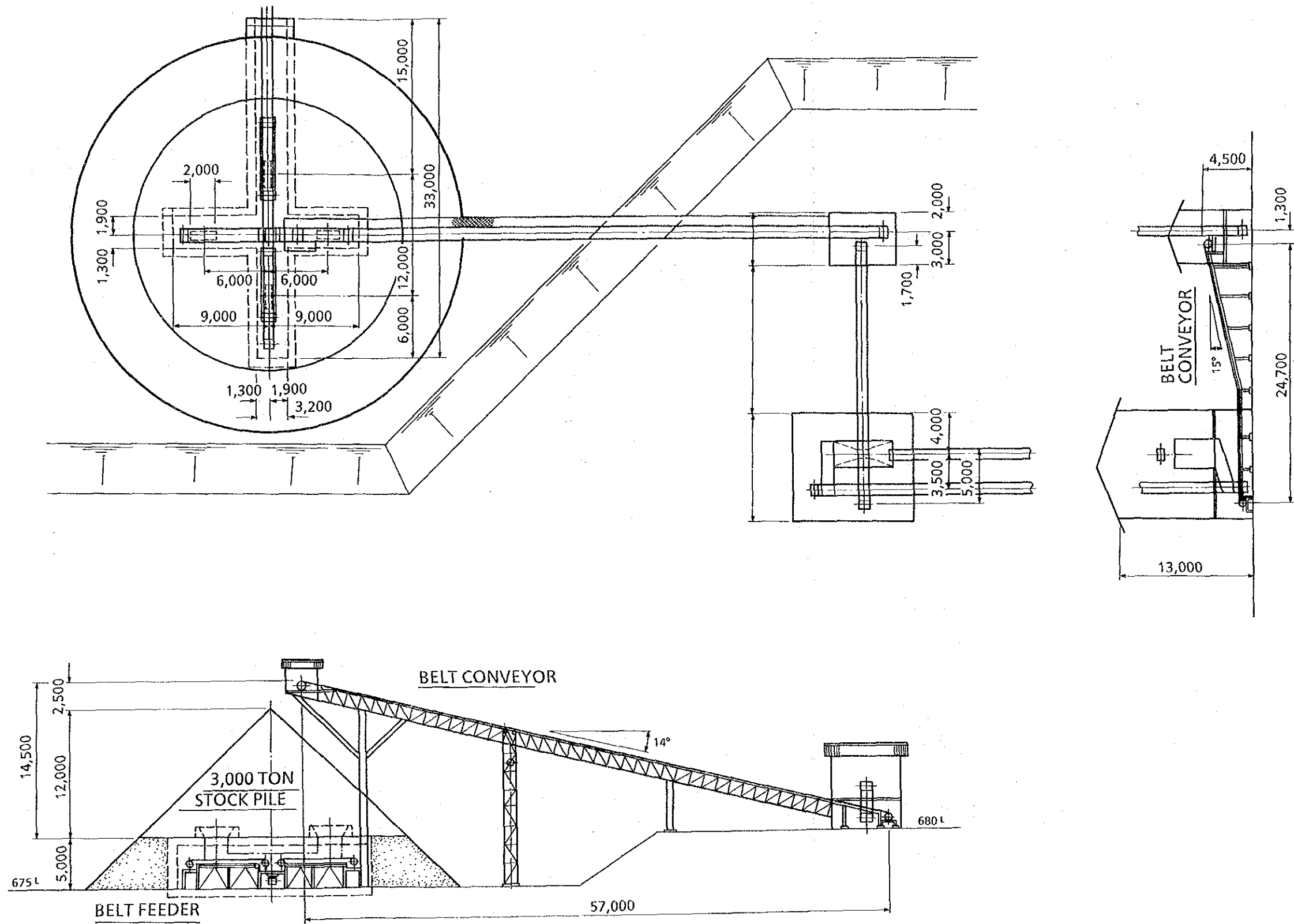


Fig. 4 General arrangement of fine ore stockpile

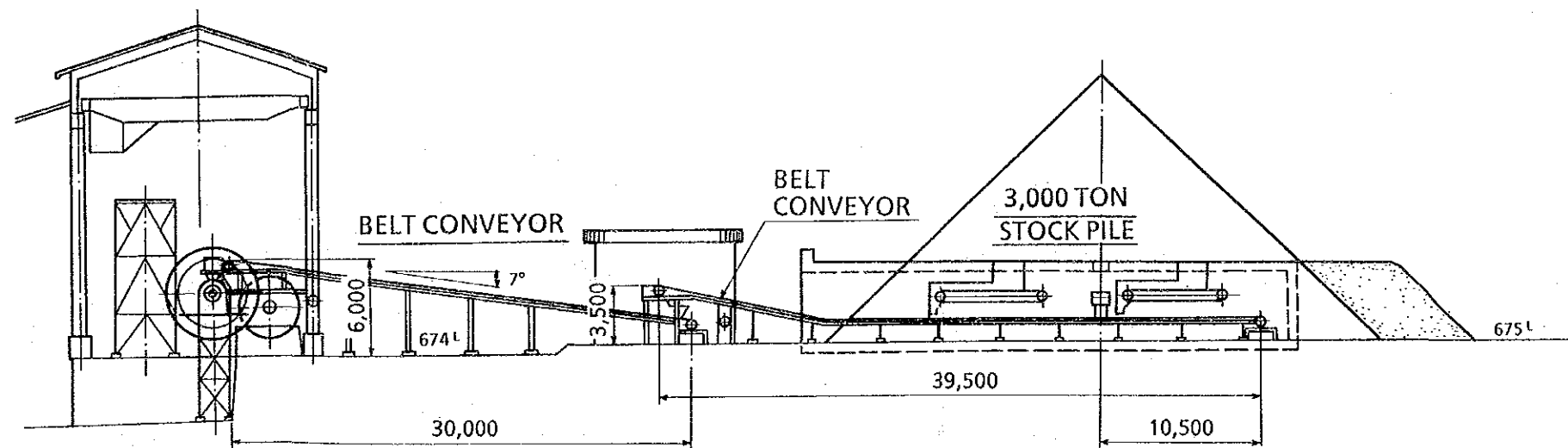
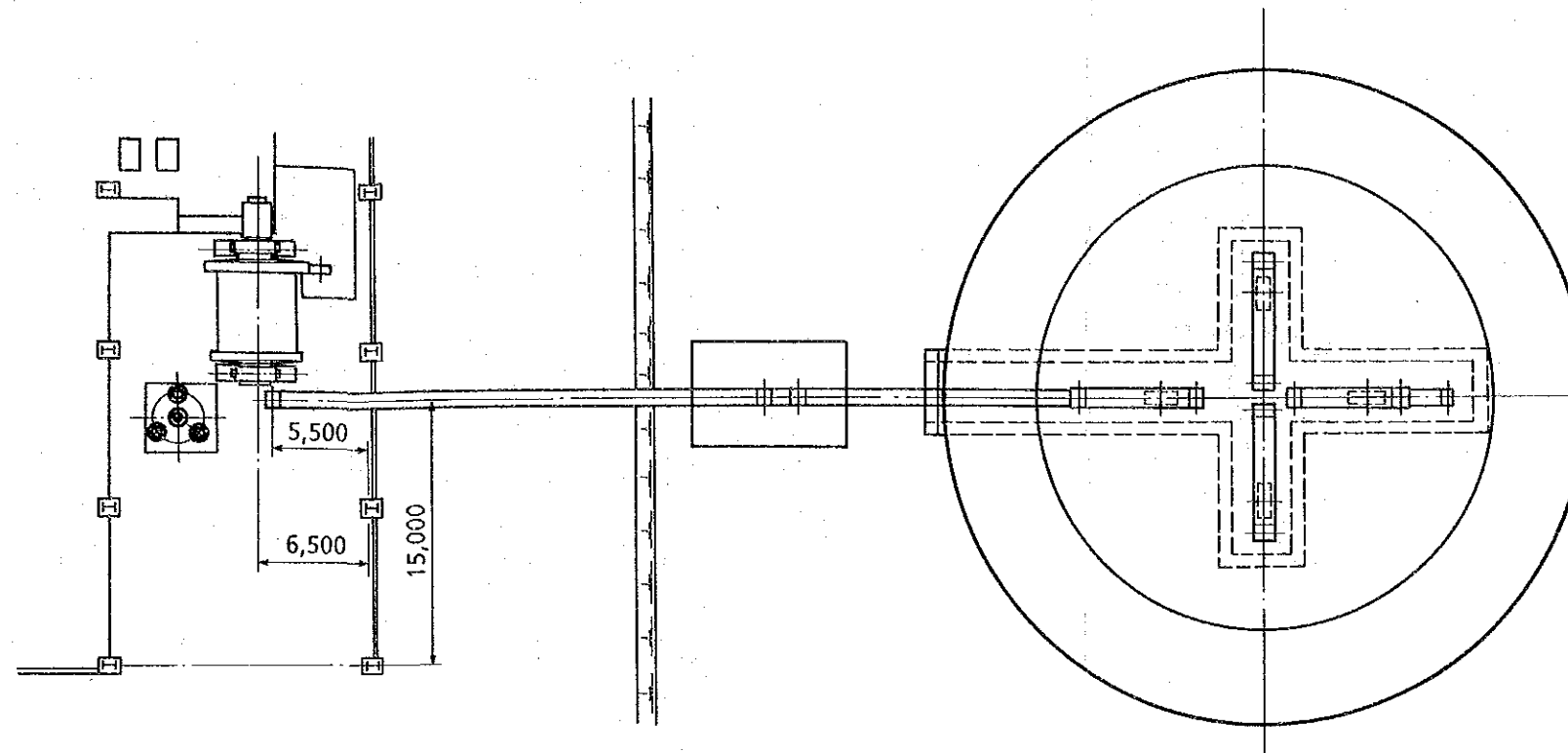


Fig. 5 General arrangement of fine ore stockpile and ball mill

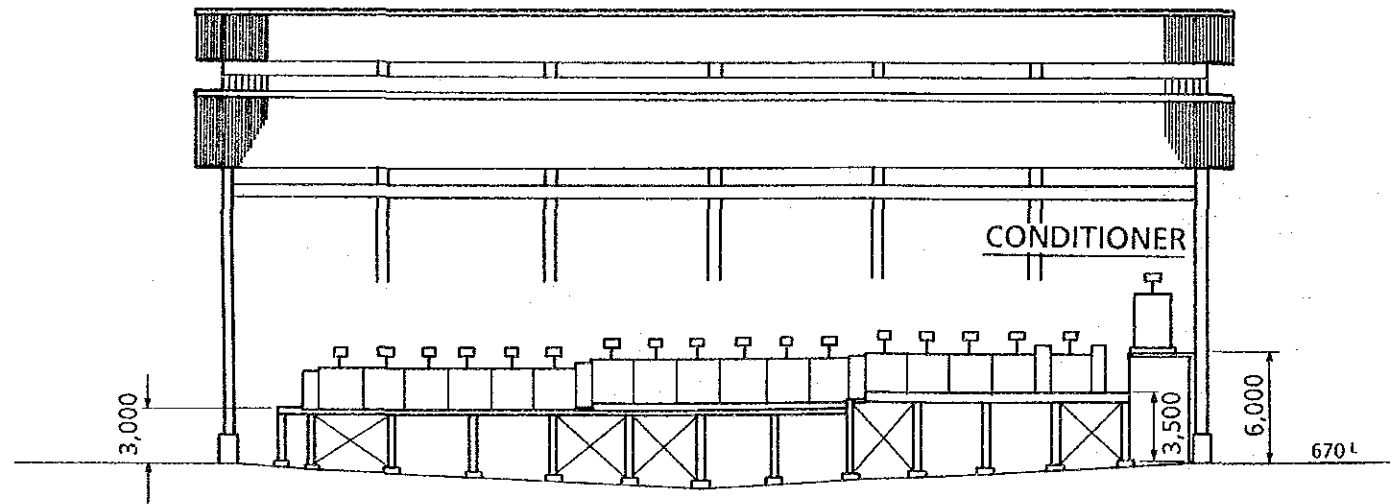
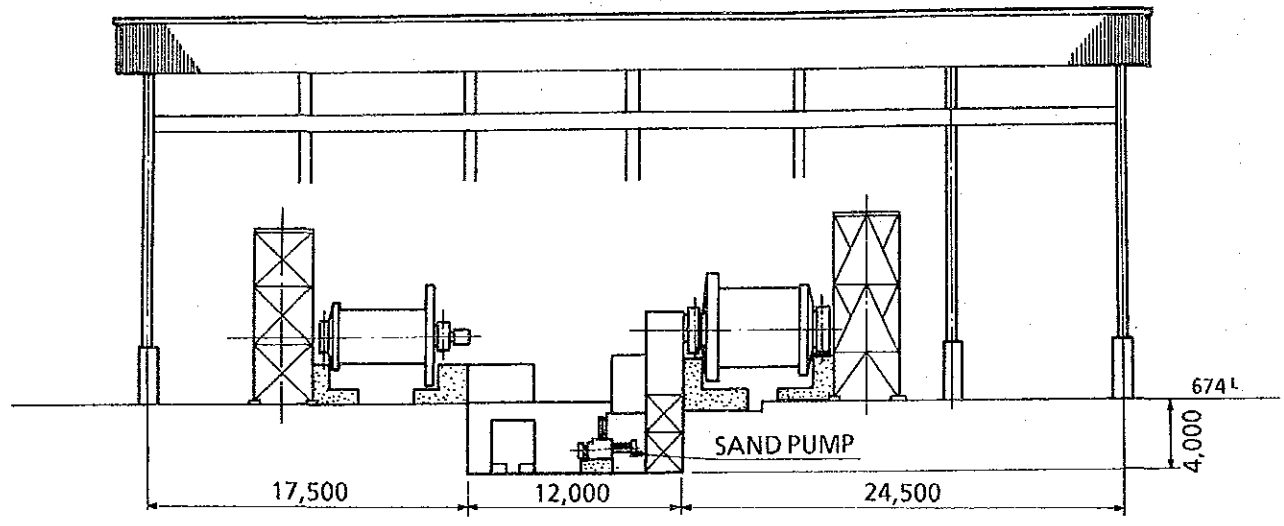
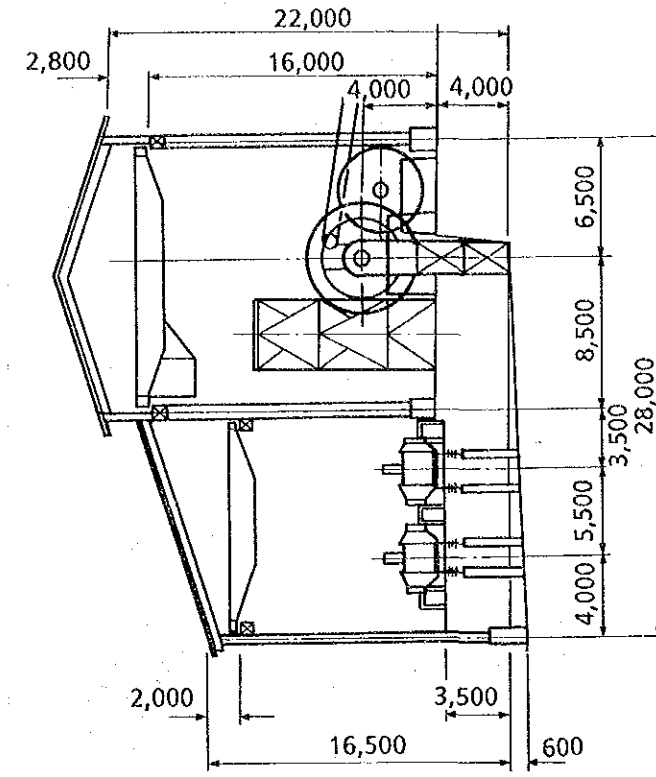
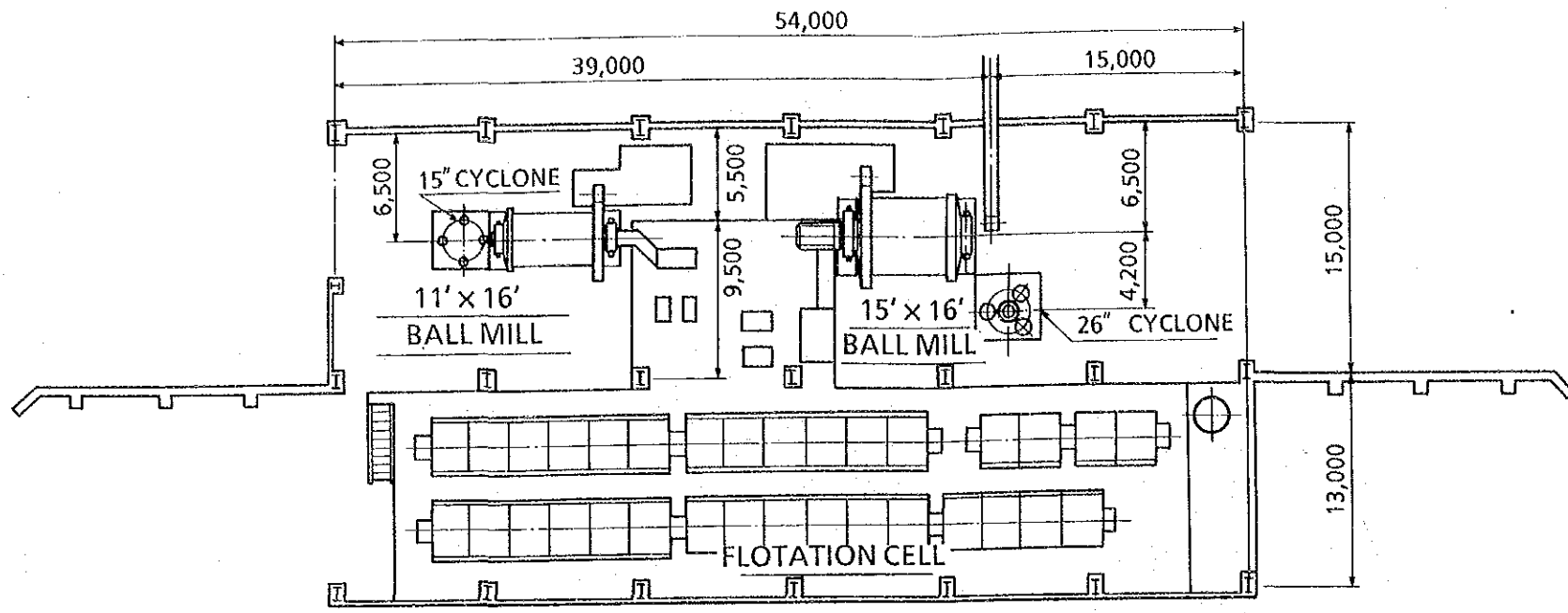


Fig. 6 General arrangement of ball mill & flotation plant

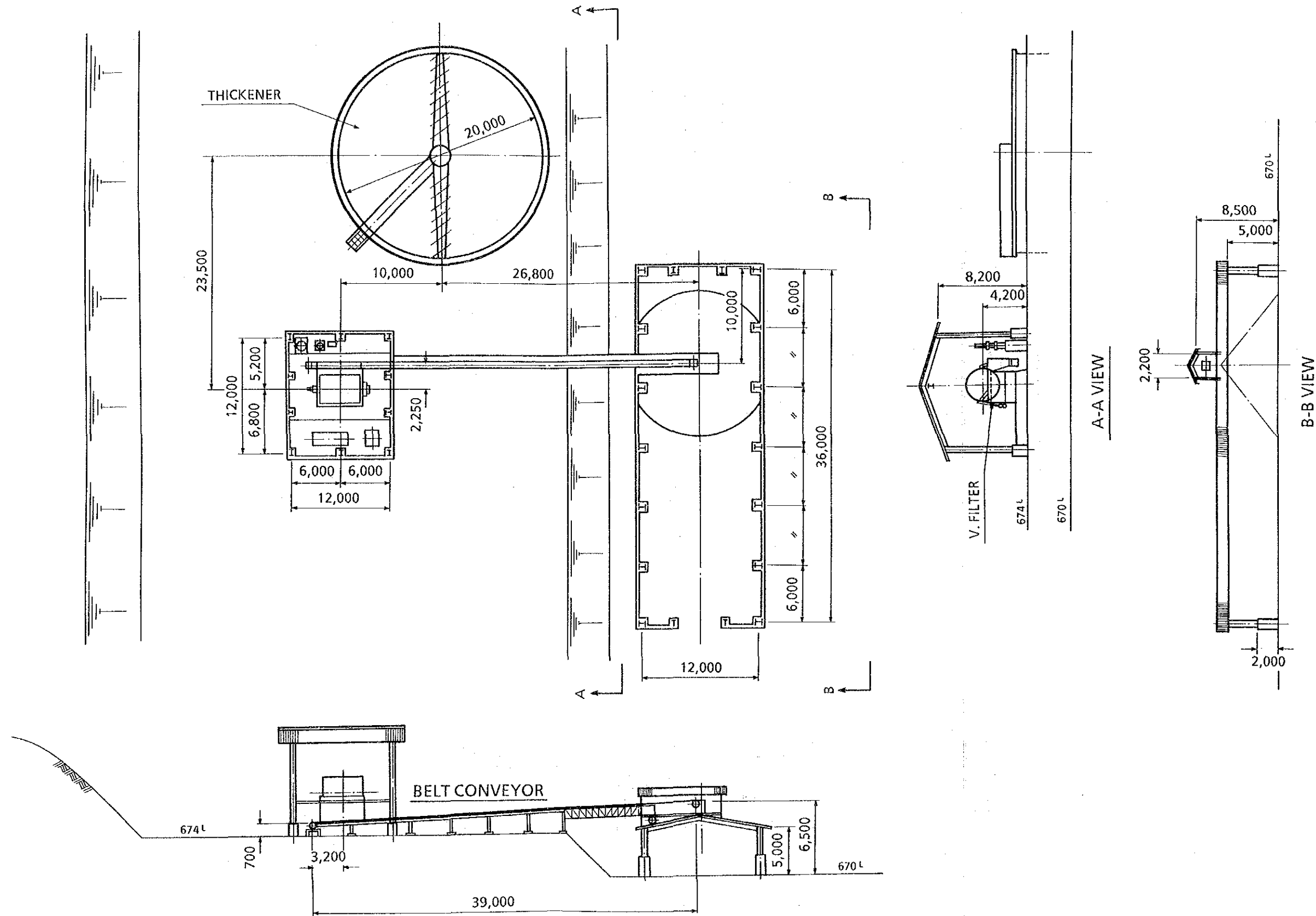


Fig. 7 General arrangement of filter plant & concentrate stockyard

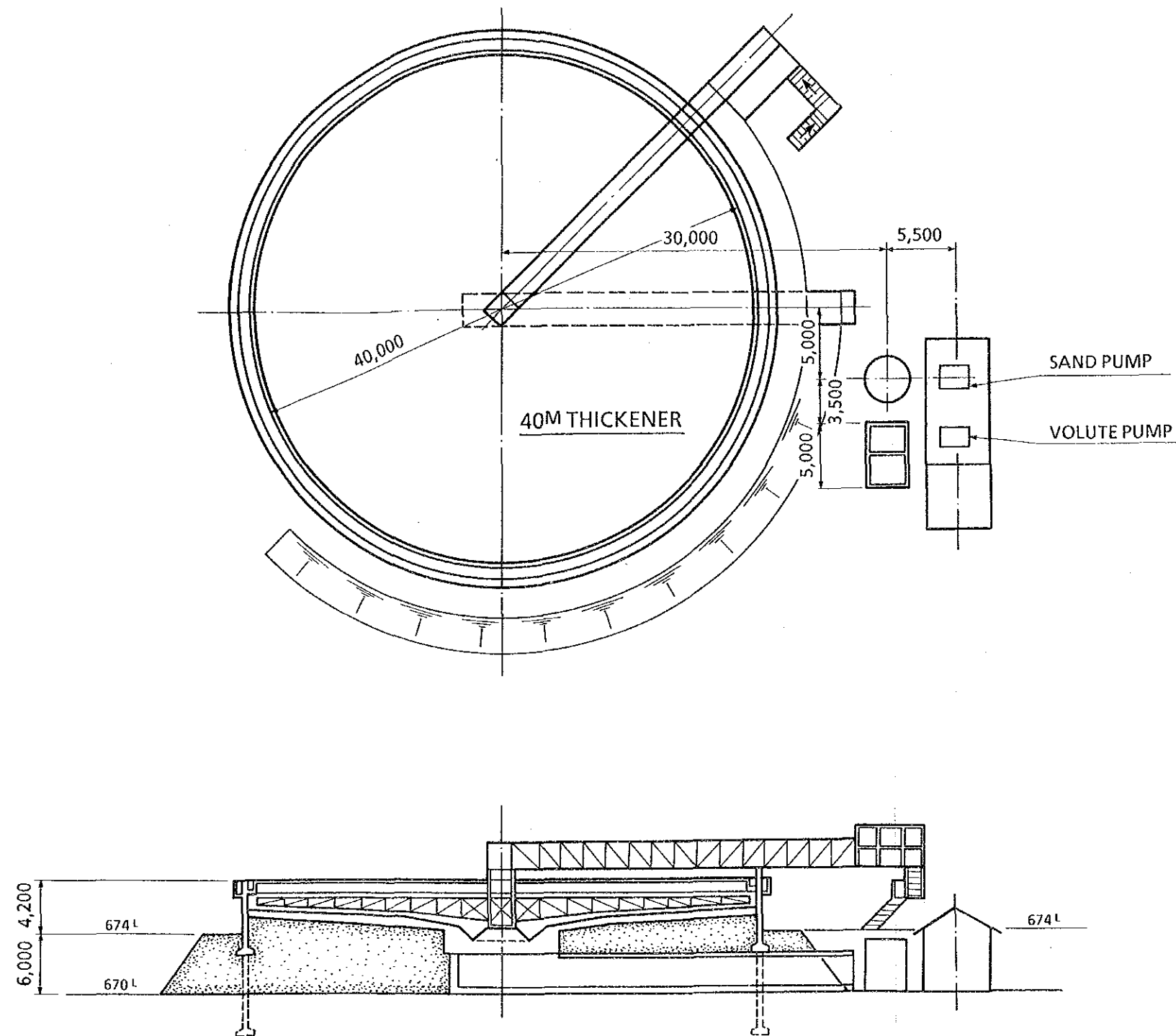


Fig. 8 General arrangement of tailing thickener

