

REFERENCE DATA

DRILLING REPORT

DRILLING REPORT

HOLE No. : B.1

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 1.

R.L. GROUND SURFACE (m.d.s.l) : +96.63 m.

CO-ORDINATES : N 1719.77.
E 2112.50.

R.L. BOTTOM OF HOLE (m.d.s.l) : +66.63 m.

DEVIATION FROM VERTICAL : 0°

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.

DIRECTION : VERTICAL.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : WAKIN.

Drilling rig : YBM YSO 1. Started : OCTOBER 4, 1982.

Finished : OCTOBER 8, 1982. Logged by :

Date : OCTOBER 9, 1982. Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)		WATER PRESSURE TESTS (kg/cm ²)		LUGEON UNITS																										
		0.5	1.0	0.5	1.0																									
			$k = 1.64 \times 10^{-3}$	$k = 0.98 \times 10^{-3}$	$k = 7.31 \times 10^{-4}$																									
			$k = 2.24 \times 10^{-3}$	$k = 1.38 \times 10^{-3}$	$k = 0.10 \times 10^{-4}$																									
			$k = 1.64 \times 10^{-3}$	$k = 1.01 \times 10^{-3}$	$k = 9.16 \times 10^{-4}$																									
ROCK CLASSIFICATION		D		CL																										
HARDNESS				CM																										
RELATIVE DENSITY																														
CONSISTENCY		SOFT TO FIRM		FIRM TO - HARD																										
CORE BARREL	S.T.C.B	S.T.C.B																												
	D.T.C.B																													
	T.T.C.B	T.T.C.B / STEEL BITS																												
DRILL WATER LOSS %	100																													
CORE LOSS %	100																													
R.O.D. %	100																													
FRACTURE LOG	20																													
WEATHERING	CW																													
	MW																													
	F																													
STRUCTURES																														
DIAGRAM																														
LAYER TYPE		RESIDUAL SOILS																												
GEOLOGICAL DESCRIPTION		<p>Completely weathered dacitic tuff represent of silty clay, light brown with spotted grey, soft to firm, plastic, moist.</p> <p>Completely weathered dacitic tuff represent of clayey silt, reddish grey, firm, plastic, moist.</p> <p>Highly weathered dacitic tuff represent of silt, clayey, gravelly, reddish grey and brownish grey, firm to hard, slightly plastic.</p> <p>Moderately weathered dacitic tuff, brownish grey to grey, hard, fractured, weakly cemented, iron oxide infilled, joint.</p>																												
DRILLED LENGTH (m)	0.00	0.50	1.00	1.60	2.00	2.50	3.20	3.60	4.20	5.00	5.95	6.15	7.00	7.75	8.60	9.40	10.00	11.00	11.90	12.40	13.10	13.60	13.90	14.50	15.00	15.40	16.40	17.90	19.30	20.00
R.L (m.d.s.l)	+96.63						+93.03				+90.68									+81.63										
WATER LEVEL AND DATE														5.10.82	6.30.82	6.10.82	7.10.82	7.10.82	9.11.82											
CEMENTED CLEANED OUT CASING DURING DRILLING		Ø 89 mm.																												
Ø OF CORE		Ø 59.2 mm.																												
DRILLING METHOD		DRY DRILLING																												

WATER

DRILLING REPORT

HOLE No: BG.1.A.

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAMSITE.

CO-ORDINATES : N
E

R.L GROUND SURFACE (m.a.s.l) : +65.12 m.

DEVIATION FROM VERTICAL : 0°.

R.L BOTTOM OF HOLE (m.a.s.l) : +25.12 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : +40.00 m.

SCALE : 1:100.

Contractor : PT. WIRATMAN & Ass. Driller : Suharto.

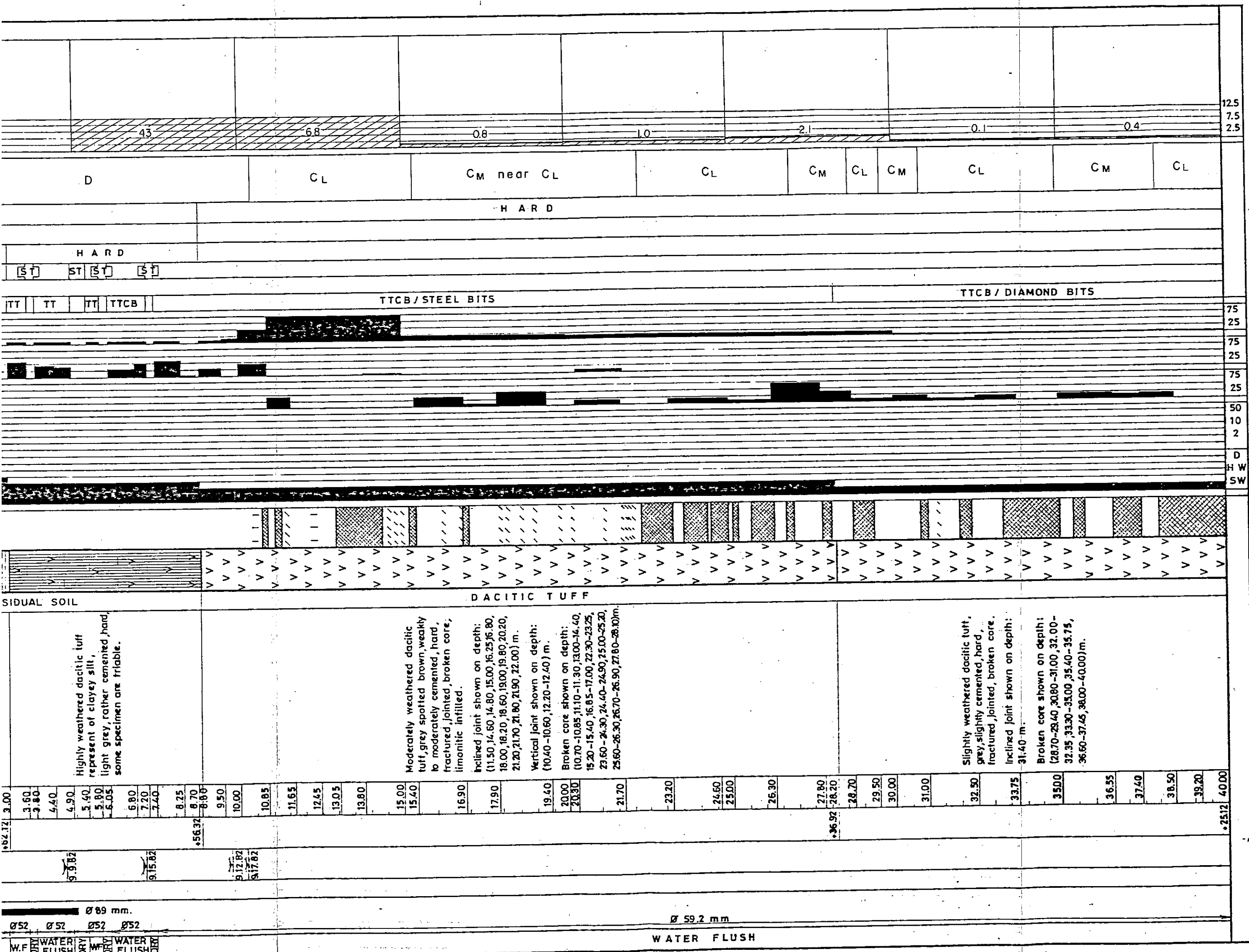
Drilling rig : TONE TASS 3E Started : September 7, 1982.

Finished : September 17, 1982. Logged by :

Date : September 18, 1982 Checked by :

Remarks :

TESTS		WATER PRESSURE		LENGTH OF SECTIONS TESTED: 5m	
LUGEON UNITS		L/min/m		6 4 2	
ROCK CLASSIFICATION		D		CL	
HARDNESS		H A R D		C _M near C _L	
RELATIVE DENSITY					
CONSISTENCY		SOFT FIRM TO HARD		H A R D	
CORE BARREL	STCB	STCB	[ST]	[ST]	[ST]
	DTCB				
	TTCB	TT	TT	TT	TTCB
DRILL WATER LOSS %		100		TTCB / STEEL BITS	
CORE LOSS %		50			
R.Q.D %		100			
FRACTURE LOG		20			
WEATHERING		CW			
STRUCTURES		MW			
DIAGRAM		F			
LAYER TYPE		TOP SOIL		RESIDUAL SOIL	
GEOLOGICAL DESCRIPTION		<p>Top soil, silty clay with some roots fragments, brown, soft, plastic, moist.</p> <p>Completely weathered dacitic tuff represent of silty clay, brown, firm to hard, plastic, moist.</p> <p>Highly weathered dacitic tuff represent of clayey silt, light grey, rather cemented, hard, some specimen are friable.</p>		<p>DACITIC TUFF</p> <p>Moderately weathered dacitic tuff, grey spotted brown, weakly to moderately cemented, hard, fractured, jointed, broken core, limonitic infilled.</p> <p>Inclined joint shown on depth: 11.50, 14.60, 14.80, 15.00, 16.25, 16.80, 18.00, 18.20, 18.60, 19.00, 19.80, 20.20, 21.20, 21.70, 21.80, 21.90, 22.00) m.</p> <p>Vertical joint shown on depth: (10.40 - 10.60, 12.20 - 12.40) m.</p> <p>Broken core shown on depth: (10.70 - 10.85, 11.10 - 11.30, 13.00 - 14.40, 15.20 - 15.40, 16.85 - 17.00, 22.30 - 23.25, 23.60 - 24.30, 24.40 - 24.90, 25.00 - 25.20, 25.60 - 26.30, 26.70 - 26.90, 27.80 - 28.10) m.</p>	
DRILLED LENGTH (m)	0.00	0.60	1.00	1.70	2.70
R.L (m.a.s.l)	+65.12	+64.52	+64.12	+62.12	+62.12
WATER LEVEL AND DATE		9.7.82	9.7.82	9.15.82	9.12.82
CEMENTED CLEANED OUT					
CASING DURING DRILLING					
Ø OF CORE		Ø 59.2mm	Ø 52	Ø 52	Ø 52
DRILLING METHOD	DRY DRILLING	W.F	W.F	W.F	W.F



DRILLING REPORT

HOLE No : BG.2 A.

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM SITE

CO-ORDINATES : N
E
DEVIATION FROM VERTICAL : 0°

R.L. GROUND SURFACE (m.d.s.l) : +84.51 m

R.L. BOTTOM OF HOLE (m.d.s.l) : +54.51 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m

SCALE : 1 : 100

Contractor : PT. WIRATMAN & ASS Driller :

Drilling rig : TONE TASS 3E Started : SEPTEMBER 16.1982

Finished : SEPTEMBER.25.1982. Logged by :

Date : SEPTEMBER 26.1982 Checked by :

Remarks :

T E S T S : σ_c (Kg/cm ²)		WATER PRESSURE		LENGTH OF SECTIONS TESTED: 5m		L/min/m	
LUGEON UNITS		TESTS		L/min/m		L/min/m	
ROCK CLASSIFICATION		D		CL		D CL D CL	
HARDNESS						H A	
RELATIVE DENSITY							
CONSISTENCY		FIRM TO HARD		H A		R : D	
CORE	S.T.C.B	S.T.C.B					
BARREL	D.T.C.B					T.T.C.B / DIAMOND BITS	
	T.T.C.B						
DRILL WATER LOSS %	100						
CORE LOSS %	50						
R.Q.D %	100						
FRACTURE LOG	20						
WEATHERING	CW						
	MW						
	F						
STRUCTURES							
DIAGRAM							
LAYER TYPE		RESIDUAL SOIL				D A	
GEOLOGICAL DESCRIPTION		Completely weathered dacitic tuff represent of silty clay, brown, firm to hard, plastic.		Highly weathered dacitic tuff represents of clayey silt, grey and brown, hard, plastic, friable, rather cemented.		Moderately weathered dacitic tuff, grey spotted brown, weakly cemented, hard, fractured, jointed, broken core, and mostly smolitic infilled.	
DRILLED LENGTH (m)	0.30	0.50	0.80	1.00	2.40	3.00	4.50
R.L (m.a.s.l)	+84.51				+82.11		
WATER LEVEL AND DATE	16.9.82	16.9.82	25.9.82	17.9.82	21.9.82	22.9.82	25.9.82
CEMENTED CLEANED OUT							
CASING DURING DRILLING							
Ø OF CORE		59.2 mm		52 mm			
DRILLING METHOD		DRY DRILLING		WATER FLUSH			

DRILLING REPORT

HOLE No : B.2

PROJECT : KOTAPANJANG H.E.R.P.

LOCALITY : DAM AXIS. 1

CO-ORDINATES : N 1716.92.
E 2077.62.

R.L. GROUND SURFACE (m.a.s.l.) : +79.26 m

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.a.s.l.) : +39.26 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m

SCALE : 1 : 100

Contractor : PT WIRATMAN & Ass Driller : WAKIN

Drilling rig : YBM YSO 1 Started : SEPTEMBER 25. 1982

Finished : OCTOBER 3. 1982. Logged by :

Date : OCTOBER 4. 1982 Checked by :

Remarks :

TESTS: σ_c (Kg/cm²)

WATER PRESSURE TESTS (kg/cm ²)	10	
	5	
	0	
	LUGEON UNITS	

ROCK CLASSIFICATION

HARDNESS

RELATIVE DENSITY

CONSISTENCY

CORE BARREL	S.T.C.B	
	D.T.C.B	
	T.T.C.B	

DRILL WATER LOSS %	100	
CORE LOSS %	100	
R.Q.D %	100	

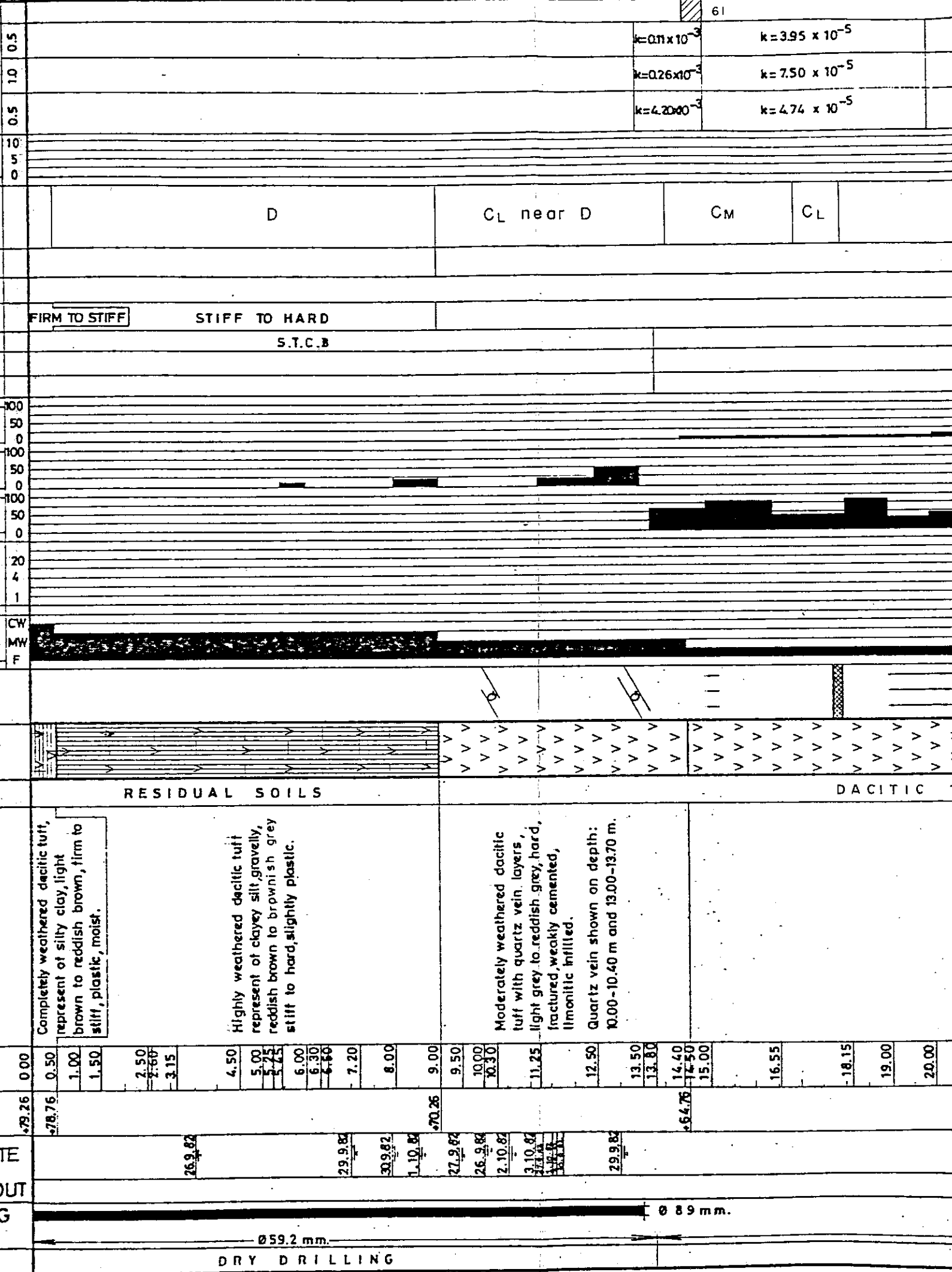
FRACTURE LOG

WEATHERING

STRUCTURES

DIAGRAM

LAYER TYPE	RESIDUAL SOILS	DACITIC TUFF
GEOLOGICAL DESCRIPTION	Completely weathered dacitic tuff, represent of silty clay, light brown to reddish brown, firm to stiff, plastic, moist. Highly weathered dacitic tuff represent of clayey silt, gravelly, reddish brown to brownish grey stiff to hard, slightly plastic. Moderately weathered dacitic tuff with quartz vein. layers, light grey to reddish grey, hard, fractured, weakly cemented, ilmenitic infilled. Quartz vein shown on depth: 10.00-10.40 m and 13.00-13.70 m.	
DRILLED LENGTH (m)	0.00 0.50 1.00 1.50 2.50 2.60 3.15 4.50 5.00 5.25 5.45 6.00 6.30 6.60 7.20 8.00 9.00 9.50 10.00 10.30 11.25 12.50 13.50 13.80 14.40 14.50 15.00 16.55 18.15 19.00 20.00	
R.L (m.a.s.l)	+79.26 +78.76 +78.26 +77.76 +77.26 +76.76 +76.26 +75.76 +75.26 +74.76 +74.26 +73.76 +73.26 +72.76 +72.26 +71.76 +71.26 +70.76 +70.26 +69.76 +69.26 +68.76 +68.26 +67.76 +67.26 +66.76 +66.26 +65.76 +65.26 +64.76 +64.26 +63.76 +63.26 +62.76 +62.26 +61.76 +61.26 +60.76 +60.26	
WATER LEVEL AND DATE	26.9.82 29.9.82 30.9.82 1.10.82 27.9.82 26.9.82 2.10.82 3.10.82 3.10.82 3.10.82 29.9.82	
CEMENTED CLEANED OUT		
CASING DURING DRILLING		
Ø OF CORE	Ø 59.2 mm	Ø 89 mm
DRILLING METHOD	DRY DRILLING	



61	$k=0.11 \times 10^{-3}$	$k=3.95 \times 10^{-5}$
	$k=0.26 \times 10^{-3}$	$k=7.50 \times 10^{-5}$
	$k=4.20 \times 10^{-3}$	$k=4.74 \times 10^{-5}$

DRILLING REPORT

HOLE No : B.3

PROJECT : KOTAPANJANG H.E.R.P.

LOCALITY : DAM AXIS 1.

R.L. GROUND SURFACE (m.a.s.l) : +56.87 m.

CO-ORDINATES : N 1712.50
E 2022.80.

R.L. BOTTOM OF HOLE (m.a.s.l) : + 6.87 m.

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m.

SCALE : 1 : 100.

Contractor : PT. WRATMAN & Ass. Driller : WAKIN.

Drilling rig : YBM YSO 1. Started : SEPTEMBER 15. 1982.

Finished : SEPTEMBER 23. 1982. Logged by :

Date : OCTOBER 24. 1982. Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)				
WATER PRESSURE TESTS (kg/cm ²)	0.5	k=4.30 x 10 ⁻⁴	k=7.77 x 10 ⁻⁶	k=1.84 x 10 ⁻⁵
	1.0	k=6.40 x 10 ⁻⁴	k=2.33 x 10 ⁻⁵	k=2.77 x 10 ⁻⁵
	0.5	k=2.98 x 10 ⁻⁴	k=7.77 x 10 ⁻⁶	k=9.21 x 10 ⁻⁶
LUGEON UNITS		10		
		5		
		0		
ROCK CLASSIFICATION		D		C.L
HARDNESS				
RELATIVE DENSITY				
CONSISTENCY		SOFT FIRM TO HARD		
CORE BARREL	S.T.C.B	S.T.C.B	S.T.C.B	STCB
	D.T.C.B			
	T.T.C.B	T.T.	T.T.C.B/STELL BITS	
DRILL WATER LOSS %		100		
		50		
		0		
CORE LOSS %		100		
		50		
		0		
R.Q.D %		100		
		50		
		0		
FRACTURE LOG		20		
		4		
		1		
WEATHERING		CW		
		MW		
		F		
STRUCTURES				
DIAGRAM				
LAYER TYPE		RESIDUAL SOILS		
GEOLOGICAL DESCRIPTION		<p>Top Soils, Silty clay, light grey, soft, plastic, containing some roots fragments.</p> <p>Highly weathered dacitic tuff represent of clayey silt light brown to brown, firm to hard, plastic with some iron oxide fragments as shown on depth: (0.80, 2.75-2.80, 3.00-3.20, 4.80-4.90) m, hard, reddish brown.</p> <p>Moderately weathered dacitic tuff, light grey, brownish grey, fractured, hard, weakly cemented, limonitic infilled.</p> <p>Vertical joint shown on depth: (7.90-8.00, 10.00-10.20) m.</p> <p>Inclined joint shown on depth: (7.20, 7.30, 7.60, 8.50, 8.70, 8.80, 8.90, 9.20) m.</p> <p>Broken core shown on depth: 5.85-6.10, 6.40-6.50, 8.00-8.30; 9.60-10.00, 10.55-10.80) m.</p>		
DRILLED LENGTH (m)		0.00		
		0.20		
		0.50		
		1.00		
		1.60		
		2.45		
		3.00		
		3.15		
		3.50		
		4.10		
		4.45		
		4.90		
		5.30		
		6.50		
		7.90		
		9.45		
		10.00		
		10.80		
		11.00		
		12.35		
		12.50		
		12.85		
		13.50		
		15.00		
		16.50		
		17.75		
		18.85		
		20.00		
R.L (m.a.s.l)		+56.87		
		+56.87		
		+51.97		
WATER LEVEL AND DATE		15.9.82		
		17.9.82		
		16.9.82		
		17.9.82		
		18.9.82		
		19.9.82		
		21.9.82		
		22.9.82		
		20.9.82		
		23.9.82		
		+46.07		
CEMENTED CLEANED OUT		23.9.82		
CASING DURING DRILLING		Ø 89 mm.		
Ø OF CORE		Ø 59.2 mm		
		Ø 52 mm		
		Ø 52 mm		
		Ø 52 mm		
		Ø 59.2 mm.		
DRILLING METHOD		DRY DRILLING		
		W.F. DRY DRILLING		
		WATER FLUSH		
		DRY		

6	$k=1.84 \times 10^{-5}$	$k=1.98 \times 10^{-4}$	$k=1.29 \times 10^{-4}$	$k=1.09 \times 10^{-4}$	$k=3.15 \times 10^{-5}$	$k=2.68 \times 10^{-5}$	$k=1.45 \times 10^{-4}$
5	$k=2.77 \times 10^{-5}$	$k=2.27 \times 10^{-4}$	$k=2.04 \times 10^{-4}$	$k=1.54 \times 10^{-4}$	$k=3.79 \times 10^{-5}$	$k=3.79 \times 10^{-4}$	$k=1.83 \times 10^{-4}$
6	$k=9.21 \times 10^{-6}$	$k=1.56 \times 10^{-4}$	$k=1.88 \times 10^{-4}$	$k=1.54 \times 10^{-4}$	$k=3.15 \times 10^{-5}$	$k=3.43 \times 10^{-4}$	$k=1.59 \times 10^{-4}$

12.5
2.5
2.5

C_M

C_L

C_M

C_H

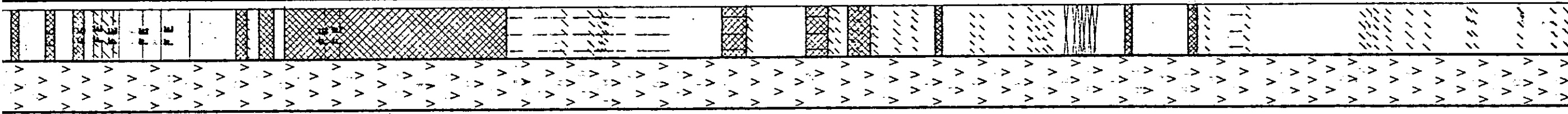
C_M

C_H

H A R D

T.I.C.B / DIAMOND BITS

75
25
75
25
75
25
50
10
2
D
HW
SW



D A C I T I C T U F F

Slightly weathered dacitic tuff, grey, hard, fractured, moderately cemented, broken core, jointed, limonite infilled, brecciated.

Vertical joint shown on depth: (12.60-12.75, 25.00-25.30, 25.70-25.85, 26.00-26.25, 26.50-26.85, 27.50-27.65, 28.00-28.20, 28.25-28.70, 27.00-27.40, 30.00-30.60, 32.00-32.50, 42.00-42.25) m

Inclined joint shown on depth: (15.18, 15.40, 15.60, 18.80, 26.30, 26.95, 27.10, 27.15, 27.20, 30.70, 32.60, 32.70, 33.10, 33.20, 33.60, 34.10, 34.90, 35.10, 36.80, 35.90, 36.10, 37.20, 37.45, 37.60, 37.70, 41.10, 41.45, 42.40, 45.10, 45.20, 45.40, 45.70, 46.20, 46.60, 47.60, 47.70, 48.85, 49.60, 49.90) m

Cross joint shown on depth: (38.00, 38.20, 38.35, 38.40, 38.60, 38.70) m

Broken core shown on depth: (13.20-13.35, 14.00-14.20, 14.70-14.90, 18.50-18.80, 19.00-19.40, 19.70-24.90, 30.00-30.60, 32.00-32.50, 33.00-33.50, 35.00-35.10, 38.50-39.60, 41.00-41.15) m

Limonite infilled shown on depth: (14.00-14.20, 14.70-14.80, 15.18, 15.30, 15.60, 15.80, 16.30, 16.70, 16.90, 20.70-20.90) m

13.50	15.00	16.50	17.75	18.85	20.00	21.00	21.70	22.60	23.00	23.90	24.40	25.00	26.50	28.00	28.65	30.00	30.60	32.00	32.45	33.10	34.20	35.00	36.60	38.00	39.60	40.00	41.60	42.30	43.60	45.00	46.55	48.00	50.00
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+6.87

Ø 89 mm.

Ø 52 mm.

WATER FLUSH.

DRILLING REPORT

HOLE No : B.4

PROJECT : KOTAPANJANG H.E.PP

LOCALITY : DAM AXIS 1.

R.L.GROUND SURFACE (m.a.s.l) : +55.07 m.

CO-ORDINATES : N 1701.71.
E 1871.19.

R.L.BOTTOM OF HOLE (m.a.s.l) : +5.07 m

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m

SCALE : 1 : 100

Contractor : PT.WIRATMAN & Ass. Driller : SUPARDI.

Drilling rig : TONE TAS-3E. Started : October 15. 1982.

Finished : October 25. 1982. Logged by :

Date : OCTOBER 26. 1982. Checked by :

Remarks :

TESTS: \bar{c} (Kg/cm ²)																																															
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k=3.44 \times 10^{-4}$	$k=2.17 \times 10^{-5}$	$k=1.58 \times 10^{-5}$																																										
	10		$k=3.82 \times 10^{-4}$	$k=1.09 \times 10^{-4}$	$k=1.16 \times 10^{-4}$																																										
	0.5		$k=2.04 \times 10^{-4}$	$k=3.26 \times 10^{-5}$	$k=1.05 \times 10^{-5}$																																										
LUGEON UNITS		10																																													
ROCK CLASSIFICATION		D	CL near D		CM																																										
HARDNESS																																															
RELATIVE DENSITY																																															
CONSISTENCY		SOFT																																													
CORE BARREL	S.T.C.B	S.T.C.B																																													
	D.T.C.B																																														
	T.T.C.B	T.T.C.B / STEEL BITS																																													
DRILL WATER LOSS %	100																																														
CORE LOSS %	100																																														
R.Q.D %	100																																														
FRACTURE LOG	20																																														
	4																																														
	1																																														
WEATHERING	CW																																														
	MW																																														
	F																																														
STRUCTURES																																															
DIAGRAM																																															
LAYER TYPE	RESIDUAL SOILS																																														
GEOLOGICAL DESCRIPTION	<p>Completely weathered dacitic tuff represent of silty clay, sandy brown, soft, plastic.</p> <p>Moderately weathered dacitic tuff, grey, hard, weakly cemented, jointed, limonitic, infilled, broken core.</p> <p>Inclined joint shown on depth: 6.30 m.</p> <p>Broken core shown on depth: (0.60-0.90, 1.70-2.00, 2.30-15.00)m.</p>																																														
DRILLED LENGTH (m)	0.00	0.30	0.60	1.10	1.50	1.90	2.40	2.80	3.30	3.80	4.30	4.80	5.30	5.80	6.30	6.80	7.30	7.80	8.30	8.80	9.30	9.80	10.30	10.80	11.30	11.80	12.30	12.80	13.30	13.80	14.30	14.80	15.30	15.80	16.30	16.80	17.30	17.80	18.30	18.80	19.30	19.80	20.00				
R.L (m.a.s.l)	+5.07	+5.47	0.60	1.10	1.50	1.90	2.40	2.80	3.30	3.80	4.30	4.80	5.30	5.80	6.30	6.80	7.30	7.80	8.30	8.80	9.30	9.80	10.30	10.80	11.30	11.80	12.30	12.80	13.30	13.80	14.30	14.80	15.30	15.80	16.30	16.80	17.30	17.80	18.30	18.80	19.30	19.80	20.00				
WATER LEVEL AND DATE																																															
CEMENTED CLEANED OUT CASING DURING DRILLING																																															
Ø OF CORE																																															
DRILLING METHOD	DRY	WATER FLUSH																																													

Ø 59.2 mm Ø 89 mm

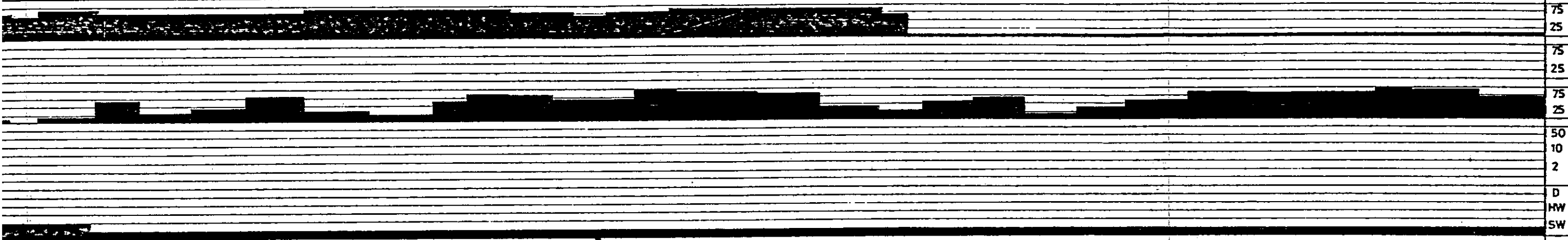
	317					282 241	
10 ⁻⁵	k=1.58x10 ⁻⁵	k=1.18x10 ⁻⁵	k=0	k=8.39x10 ⁻⁶	k=6.94x10 ⁻⁶	k=9.93x10 ⁻⁵	k=1.654x10 ⁻⁴
10 ⁻⁴	k=1.16x10 ⁻⁴	k=1.30x10 ⁻⁴	k=4.43x10 ⁻⁶	k=3.36x10 ⁻⁵	k=6.94x10 ⁻⁵	k=1.41x10 ⁻⁴	k=2.812x10 ⁻⁴
10 ⁻⁵	k=1.05x10 ⁻⁵	k=2.37x10 ⁻⁵	k=0	k=1.26x10 ⁻⁵	k=6.94x10 ⁻⁶	k=1.12x10 ⁻⁴	k=1.985x10 ⁻⁴

12.5
7.5
2.5

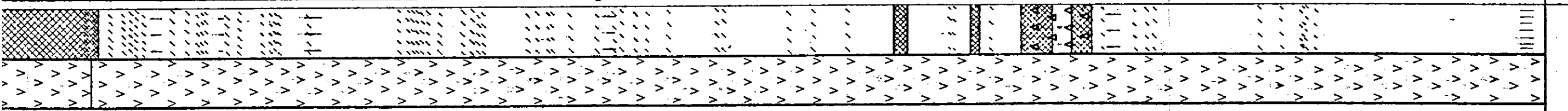
CM	CH	CM	CH	CM
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HARD

T.T.C.B / DIAMOND BITS



75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TUFF

Slightly weathered dacitic tuff, grey, hard, moderately to strongly cemented, fractured, jointed, broken core, brecciated.
 Inclined joint shown on depth: (14.90, 15.30, 15.60, 15.80, 15.90, 16.20, 16.80, 17.15, 17.40, 17.50, 17.60, 18.10, 18.40, 18.95, 19.10, 19.20, 19.30, 14.70, 14.80, 20.10, 22.30, 22.50, 22.60, 22.70, 22.90, 23.00, 23.30, 23.85, 24.05, 24.15, 24.35, 25.65, 25.90, 26.00, 26.40, 27.10, 27.50, 27.65, 28.00, 28.30, 28.80, 30.00, 30.15, 31.80, 32.40, 33.20, 35.60, 35.70, 35.80, 35.90, 36.60, 39.30, 40.10, 40.40, 40.60, 43.15, 43.70, 44.15, 44.20, 44.50) m.
 Vertical joint shown on depth: (16.30-16.50, 17.90-18.00, 20.00-20.40, 27.30-27.50, 49.40-49.70) m.
 Broken core shown on depth: (34.30-34.60, 36.10-36.30, 37.30-38.00, 38.50-39.00) m.
 Brecciated zone shown on depth: (37.30-39.00) m.

14.50	13.60	16.50	15.80	15.80	16.00	17.30	18.60	20.00	21.60	23.15	24.00	25.00	26.50	27.30	28.85	30.00	31.00	32.50	34.00	34.60	35.00	35.95	36.30	37.40	38.00	38.80	39.10	40.00	40.75	41.50	43.00	44.50	45.00	46.00	46.85	49.40	50.00
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5.07

Ø 52 mm

WATER FLUSH

DRILLING REPORT

HOLE No : B.5

PROJECT : KOTAPANJANG H.E.R.P.

LOCALITY : DAM AXIS 1.

CO-ORDINATES : N 1698.07.
E 1819.82.

R.L. GROUND SURFACE (m.d.s.l) : +76.05 m

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.d.s.l) : +36.05 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m

SCALE : 1 : 100

Contractor : PT WIRATMAN & Ass Driller : Supardi

Drilling rig : TONE TASS-3E Started : OCTOBER 7, 1982

Finished : OCTOBER 12, 1982. Logged by:

Checked by:

Remarks

TESTS: σ_c (Kg/cm ²)		252			
WATER PRESSURE TESTS (kg/cm ²)	0.5	k=4.19 x 10 ⁻⁵	k=1.79 x 10 ⁻⁴	k=1.08 x 10 ⁻⁵	k=2.08 x 10 ⁻⁶
	1.0	k=8.38 x 10 ⁻⁵	k=3.24 x 10 ⁻⁴	k=4.34 x 10 ⁻⁵	k=1.04 x 10 ⁻⁶
	0.5	k=6.98 x 10 ⁻⁵	k=2.76 x 10 ⁻⁴	k=2.17 x 10 ⁻⁵	k=4.14 x 10 ⁻⁶
LUGEON UNITS					
ROCK CLASSIFICATION		D		CL	CM CH
HARDNESS		H A R D			
RELATIVE DENSITY					
CONSISTENCY		FIRM FIRM TO HARD			
CORE BARREL	S.T.C.B	TTCB		T.T.C.B/ STEEL BITS	
	D.T.C.B				
	T.T.C.B				
DRILL WATER LOSS %	100				
CORE LOSS %	100				
R.Q.D %	100				
FRACTURE LOG	20				
WEATHERING	CW				
STRUCTURES	MM				
DIAGRAM	F				
LAYER TYPE		RESIDUAL SOIL		DACITIC TUFF	
GEOLOGICAL DESCRIPTION		Top soils, silty clay with some organic plant remains, brown, plastic, moist. Completely weathered dacitic tuff represent of silty clay, gravelly, brown, firm, plastic, moist. Highly weathered dacitic tuff represent of clayey silt, gravelly, reddish brown, firm to hard, slightly plastic, moist.		Moderately weathered dacitic tuff, light brown and light grey, hard, weakly cemented, fractured, commonly broken core, except on depth : (7.00 - 7.55, 7.70 - 9.10, 11.00 - 11.10, 12.00 - 12.70, 14.30 - 14.45) m.	
DRILLED LENGTH (m)		0.00	0.30	0.50	1.00
R.L (m.a.s.l)		+76.05	+76.75	+75.25	
WATER LEVEL AND DATE			8.10.82	8.10.82	9.10.82
CEMENTED CLEANED OUT					
CASING DURING DRILLING		Ø 52 mm			
O OF CORE		Ø 52 mm			
DRILLING METHOD		DRY DRILLING		WATER FLUSH	

	$k=4.19 \times 10^{-5}$	$k=1.79 \times 10^{-4}$	$k=1.08 \times 10^{-5}$	$k=2.08 \times 10^{-6}$	$k=8.50 \times 10^{-5}$	$k=0$	$k=3.32 \times 10^{-4}$
	$k=8.38 \times 10^{-5}$	$k=3.24 \times 10^{-4}$	$k=4.34 \times 10^{-5}$	$k=1.04 \times 10^{-5}$	$k=2.125 \times 10^{-5}$	$k=1.25 \times 10^{-6}$	$k=4.23 \times 10^{-4}$
	$k=6.98 \times 10^{-5}$	$k=2.76 \times 10^{-4}$	$k=2.17 \times 10^{-5}$	$k=4.14 \times 10^{-6}$	$k=8.50 \times 10^{-6}$	$k=4.14 \times 10^{-7}$	$k=3.77 \times 10^{-4}$

248
262

12.5
7.5
2.5

D	CL	C _M	C _H	CL near C _M	C _H	CL	C _M	C _H
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H A R D

TO HARD

T.T.C.B / STEEL BITS

T.T.C.B / DIAMOND BITS

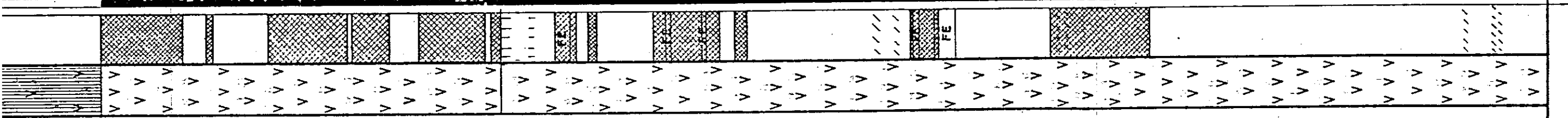
75
25

75
25

75
25

50
10
2

D
HW
SW



SOIL DACITIC TUFF

Highly weathered dacitic tuff represent of clayey silt, gravelly, reddish brown, firm to hard, slightly plastic, moist.

Moderately weathered dacitic tuff, light brown and light grey, hard, weakly cemented, fractured, commonly broken core, except on depth: (7.00-7.55, 7.70-9.10, 11.00-11.10, 12.00-12.70, 14.30-14.45) m.

Slightly weathered dacitic tuff, grey, hard, fractured, broken core, jointed, iron oxide unfilled. Vertical joint shown on depth: (14.65-14.90, 15.40-15.50) m. Inclined joint shown on depth: (23.85-24.30, 28.20, 28.40, 38.10, 38.85, 38.95) m. Broken core shown on depth: (16.00-16.50, 16.80-17.00, 18.40-20.00, 20.45-20.70, 24.60-25.30, 28.00-30.40) m. Limonitic infilled shown on depth: (16.00-16.40, 18.70-18.80, 19.60-19.70, 24.65-24.80, 25.20-28.70) m.

3.10	6.00	13.00	15.70	20.00	22.60	25.00	25.50	27.10	28.30	28.85	29.40	30.00	30.50	32.20	33.70	35.00	36.45	38.00	39.50	40.00
7.05		59.40																		36.05

8.082 8.082 9.082 10.082 10.082 11.082 10.082 12.082 13.082 14.082 15.082 16.082 17.082 18.082 19.082 20.082 21.082 22.082 23.082 24.082 25.082 26.082 27.082 28.082 29.082 30.082 31.082 32.082 33.082 34.082 35.082 36.082 37.082 38.082 39.082 40.082

89 mm 52 mm WATER FLUSH

DRILLING REPORT

HOLE No.: B.6

PROJECT : KOTAPANJANG H.E.R.P.

LOCALITY : DAM AXIS 1.

CO-ORDINATES : N 1695.34.
E 1781.41.

R.L. GROUND SURFACE (m.a.s.l) : +97.56 m.

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.a.s.l) : +67.56 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : SUPARDI.

Drilling rig : TONE TASS 3E Started : OCTOBER 2. 1982.

Finished : OCTOBER 6. 1982. Logged by:

Checked by:

Remarks:

TESTS		WATER PRESSURE TESTS (kg/cm ²)			
LUGEON UNITS		0.5	1.0	0.5	1.0
			k=1.26 x 10 ⁻⁵	k=0.713 x 10 ⁻⁵	k=3.90 x 10 ⁻⁵
			k=3.44 x 10 ⁻⁵	k=2.85 x 10 ⁻⁵	k=8.92 x 10 ⁻⁵
			k=2.9 x 10 ⁻⁵	k=2.85 x 10 ⁻⁵	k=6.69 x 10 ⁻⁵
					k=9.72 x 10 ⁻⁶
					k=1.95 x 10 ⁻⁶
					k=1.34 x 10 ⁻⁶
ROCK CLASSIFICATION		D		CL	
HARDNESS		H A R D			
RELATIVE DENSITY					
CONSISTENCY		FIRM HARD			
CORE BARREL	S.T.C.B	STC B			
	D.T.C.B				
	T.T.C.B				
DRILL WATER LOSS %		100			
CORE LOSS %		100			
R.Q.D. %		100			
FRACTURE LOG		20 4 1			
WEATHERING		CW MW F			
STRUCTURES					
DIAGRAM					
LAYER TYPE		RESIDUAL SOILS		D A C I T I C T U F F	
GEOLOGICAL DESCRIPTION		<p>Completely weathered dacitic tuff represent of silty clay yellowish brown, soft, plastic, moist.</p> <p>Highly weathered dacitic tuff represent of clayey silt reddish brown, hard, slightly plastic.</p> <p>Moderately weathered, dacitic tuff, red and brown, hard, weakly cemented, fractured, jointed, broken core.</p> <p>Limonic filled.</p> <p>Vertical joint shown on depth : (12.45 - 12.70) m</p> <p>Inclined joint shown on depth : (10.40, 10.60, 10.90, 11.10, 11.80) m.</p> <p>Broken core shown on depth : (6.30 - 6.90, 7.10 - 7.25, 7.65 - 8.30, 8.80 - 12.70) m.</p> <p>Limonic filled shown on depth : (5.40 - 5.50, 6.20 - 6.35, 7.70 - 7.90, 8.85 - 8.90, 9.10 - 9.15, 10.10 - 10.35, 13.70 - 14.00) m.</p> <p>Slightly weathered tuff, grey, hard, moderately cemented, fractured, broken core, limonic filled (13.70 - 14.00 m depth).</p> <p>Moderately weathered tuff, red, grey, brown, hard, weakly cemented, fractured, jointed, broken core :</p> <p>Vertical joint shown on depth : (17.40 - 17.60, 18.00 - 18.70, 23.50 - 23.70, 27.00 - 28.00) m.</p> <p>Broken core shown on depth : (14.90 - 16.80, 17.60 - 17.70, 16.00 - 18.70, 19.00 - 26.20, 27.00 - 27.35 ; 28.00 - 29.50) m</p>			
DRILLED LENGTH (m)		0.00	7.75	9.20	12.70
R.L (m.a.s.l)		+97.56	+93.86	+94.86	+82.66
WATER LEVEL AND DATE			2.10.82	3.10.82	5.10.82
CEMENTED CLEANED OUT					
CASING DURING DRILLING Ø OF CORE			Ø 59.2 mm	Ø 89 mm	Ø 52 mm
DRILLING METHOD			DRY DRILLING		WATER FLUSH

Remarks :

TESTS																														
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k=1.26 \times 10^{-5}$	$k=0.713 \times 10^{-5}$	$k=3.90 \times 10^{-5}$	$k=9.72 \times 10^{-6}$	$k=4.18 \times 10^{-5}$																							
	1.0		$k=3.44 \times 10^{-5}$	$k=2.85 \times 10^{-5}$	$k=8.92 \times 10^{-5}$	$k=1.95 \times 10^{-6}$	$k=5.92 \times 10^{-5}$																							
	0.5		$k=2.9 \times 10^{-5}$	$k=2.85 \times 10^{-5}$	$k=6.69 \times 10^{-5}$	$k=1.34 \times 10^{-6}$	$k=3.85 \times 10^{-5}$																							
	10																													
LUGEON UNITS																														
ROCK CLASSIFICATION			D		CL		D																							
HARDNESS			H A R D					CL																						
RELATIVE DENSITY																														
CONSISTENCY		FIRM	HARD																											
CORE BARREL	S.T.C.B	STC B																												
	D.T.C.B																													
	T.T.C.B	TTCB/STEEL BITS		TTCB/DIAMOND BITS		TTCB/STEEL BITS																								
DRILL WATER LOSS %		100						75																						
CORE LOSS %		100						75																						
R.Q.D. %		100						75																						
FRACTURE LOG		20						50																						
WEATHERING		CW						D																						
		MW						HW																						
		F						SW																						
STRUCTURES		[Patterned blocks representing geological structures]																												
DIAGRAM		[V-shaped symbols representing geological features]																												
LAYER TYPE		RESIDUAL SOILS	D A C I T I C T U F F																											
GEOLOGICAL DESCRIPTION		<p>Completely weathered dacitic tuff represent of silty clay, yellowish brown, soft, plastic, moist.</p> <p>Highly weathered dacitic tuff represent of clayey silt reddish brown, hard, slightly plastic.</p>	<p>Moderately weathered, dacitic tuff, red and brown, hard, weakly cemented, fractured, jointed, broken core.</p> <p>Limonic infilled.</p> <p>Vertical joint shown on depth: (12.45 - 12.70) m</p> <p>Inclined joint shown on depth: (10.40, 10.60, 10.90, 11.10, 11.80) m.</p> <p>Broken core shown on depth: (6.30 - 6.90, 7.10 - 7.25, 7.65 - 8.30, 8.80 - 12.70) m.</p> <p>Limonic infilled shown on depth: (5.40 - 5.50, 6.20 - 6.35, 7.70 - 7.90, 8.65 - 8.90, 9.10 - 9.15, 10.10 - 10.35, 13.70 - 14.00) m.</p>	<p>Slightly weathered tuff, grey, hard, moderately cemented, fractured, broken core, limonic infilled (13.70 - 14.00 m depth).</p>	<p>Moderately weathered tuff, red, grey, brown, hard, weakly cemented, fractured, jointed, broken core:</p> <p>Vertical joint shown on depth: (17.40 - 17.60, 18.00 - 18.70, 23.50 - 23.70, 27.00 - 28.00) m.</p> <p>Broken core shown on depth: (14.90 - 16.80, 17.60 - 17.70; 18.00 - 18.70, 19.00 - 26.20, 27.00 - 27.35; 28.00 - 29.50) m</p>	<p>Slightly weathered tuff, grey, hard, fractured, moderately cemented, commonly broken core.</p>																								
DRILLED LENGTH (m)		0.00	7.75	8.40	9.20	10.00	10.80	11.20	12.70	13.90	14.90	15.00	16.00	17.00	18.20	19.00	19.70	20.00	21.00	22.00	22.75	24.00	25.00	26.00	27.25	28.40	29.30	30.00		
R.L (m.a.s.l)		+97.56	+97.56	+93.86	+94.86	+82.66	+68.06	+67.56																						
WATER LEVEL AND DATE		2.10.82	3.10.82	4.10.82	5.10.82	6.10.82	6.10.82																							
CEMENTED CLEANED OUT CASING DURING DRILLING																														
Ø OF CORE		Ø 59.2mm																												
DRILLING METHOD		DRY DRILLING														WATER FLUSH														

DRILLING REPORT

HOLE No.: B.7

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 4.

R.L.GROUND SURFACE (m.a.s.l) : +93.85 m.

R.L.BOTTOM OF HOLE (m.a.s.l) : +63.85 m.

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.

CO-ORDINATES : N. 2083.07.
E. 2106.69.

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & ASS. Driller : KASINUN.

Drilling rig : TONE TASS 3E. Started : SEPTEMBER 7. 1982.

Finished : SEPTEMBER 9. 1982. Logged by:

Date : SEPTEMBER 10. 1982. Checked by:

Remarks :

TESTS		WATER PRESSURE TESTS (kg/cm ²)			
		0.5	1.0	0.5	0.5
LUGEON UNITS		10	5	0	0
ROCK CLASSIFICATION		D CL Cm near CL CL near Cm Cm near CL			
HARDNESS		H A R D			
RELATIVE DENSITY					
CONSISTENCY		SOFT FIRM TO HARD			
CORE BARREL	S.T.C.B	S.T.C.B			
	D.T.C.B	D.T.C.B			
	T.T.C.B	D.T.C.B			
DRILL WATER LOSS %	100	50	0	0	0
CORE LOSS %	100	50	0	0	0
R.Q.D. %	100	50	0	0	0
FRACTURE LOG	20 4 1				
WEATHERING	CW MW F				
STRUCTURES		[Structural patterns]			
DIAGRAM		[Diagram patterns]			
LAYER TYPE	RESIDUAL SOIL	D A C I T I C T U F F			
GEOLOGICAL DESCRIPTION	<p>Completely weathered dacitic tuff represents silty clay, brown, soft, plastic, moist.</p> <p>Highly weathered dacitic tuff represents clayey silt, gravelly, sandy, grey, brown, firm to hard, slightly plastic.</p> <p>Moderately weathered dacitic tuff, grey, weakly cemented, hard, fractured, jointed, broken core, commonly limonitic filled.</p> <p>Inclined joint shown on depth: (8.30, 8.75, 8.85, 10.30, 10.60, 13.10, 14.80, 15.05, 15.20, 17.20, 17.90, 18.20, 20.50) m.</p> <p>Vertical joint shown on depth: (17.50 - 17.80) m.</p> <p>Cross joint shown on depth: (25.00 - 26.50) m.</p> <p>Broken core shown on depth: (3.50 - 7.70, 9.40 - 10.00, 10.80 - 11.00, 11.80 - 12.20, 13.40 - 13.60, 15.40 - 15.50, 16.80 - 17.10, 19.20 - 19.65, 20.90 - 21.00, 22.90 - 23.00, 23.00 - 24.00, 24.60 - 25.30, 28.00 - 29.60, 29.75 - 30.00) m.</p> <p>Quartz vein shown on depth: 26.70, thickness 3-4 cm.</p>				
DRILLED LENGTH (m)	0.00 0.40 0.60 1.00 1.45 2.00 2.40 3.00 3.50 4.20 5.15 6.15 7.00 7.70 9.00 9.40 10.00 11.00 12.20 13.60 15.00 15.54 17.00 18.50 20.00 20.80 22.30				
R.L. (m.a.s.l)	+93.85 +93.45 +90.35				
WATER LEVEL AND DATE		7.9.82 6.9.82 6.9.82 6.9.82 6.9.82			
CEMENTED CLEANED OUT CASING DURING DRILLING					
Ø OF CORE		Ø 59.2mm. Ø 55mm. Ø 59.2mm. Ø 55mm.			
DRILLING METHOD		DRY DRILLING WATER FLUSH DRY WATER FLUSH.			

TESTS																																					
WATER PRESSURE TESTS (kg/cm ²)	0.5			$k=8.93 \times 10^{-4}$	$k=3.73 \times 10^{-4}$	$k=5.12 \times 10^{-4}$	$k=4.63 \times 10^{-4}$																														
	1.0			$k=1.130 \times 10^{-3}$	$k=4.87 \times 10^{-4}$	$k=5.82 \times 10^{-4}$	$k=5.20 \times 10^{-4}$																														
	0.5			$k=5.74 \times 10^{-4}$	$k=1.60 \times 10^{-4}$	$k=4.58 \times 10^{-4}$	$k=3.96 \times 10^{-4}$																														
LUGEON UNITS	10																																				
	5																																				
	0																																				
ROCK CLASSIFICATION		D	CL	C _M near CL	CL near C _M	C _M near CL	CL near C _M																														
HARDNESS		H A R D																																			
RELATIVE DENSITY																																					
CONSISTENCY		SOFT FIRM TO HARD																																			
CORE BARREL	S.T.C.B	S. T. C. B			D.T.C.B																																
	D.T.C.B																																				
	T.T.C.B																																				
DRILL WATER LOSS %	100	[REDACTED]																																			
	50	[REDACTED]																																			
	0	[REDACTED]																																			
CORE LOSS %	100	[REDACTED]																																			
	50	[REDACTED]																																			
	0	[REDACTED]																																			
R.Q.D. %	100	[REDACTED]																																			
	50	[REDACTED]																																			
	0	[REDACTED]																																			
FRACTURE LOG	20	[REDACTED]																																			
	10	[REDACTED]																																			
	4	[REDACTED]																																			
	1	[REDACTED]																																			
WEATHERING	CW	[REDACTED]																																			
	MW	[REDACTED]																																			
	F	[REDACTED]																																			
STRUCTURES		[REDACTED]																																			
DIAGRAM		[REDACTED]																																			
LAYER TYPE		RESIDUAL SOIL	D A C I T I C T U F F																																		
GEOLOGICAL DESCRIPTION		Completely weathered dacitic tuff represents silty clay, brown, soft, plastic, moist. Highly weathered dacitic tuff represents clayey silt, gravelly, sandy, grey, brown, firm to hard, slightly plastic.	Moderately weathered dacitic tuff, grey, weakly cemented, hard, fractured, jointed, broken core, commonly limonitic infilled. Inclined joint shown on depth: (8.30, 8.75, 8.85, 10.30, 10.60, 13.10, 14.80, 15.05, 15.20, 17.20, 17.90, 18.20, 20.50) m. Vertical joint shown on depth: (17.50 - 17.80) m. Cross joint shown on depth: (25.00 - 26.50) m. Broken core shown on depth: (3.50-7.70, 9.40-10.00, 10.80-11.00, 11.80-12.20, 13.40-13.60, 15.40-15.90, 16.80-17.40, 19.20-19.65, 20.90-21.00, 22.90-23.00, 23.00-24.00, 24.60-25.30, 28.00-29.60, 29.75-30.00) m. Quartz vein shown on depth: 26.70, thickness 3-4 cm.																																		
DRILLED LENGTH (m)		0.00	0.40	1.00	1.45	2.00	2.40	3.00	3.50	4.20	5.15	6.15	7.00	7.70	9.00	9.40	10.00	11.00	12.20	11.60	15.00	15.54	17.00	18.50	20.00	20.60	22.30	23.30	24.00	25.00	26.55	28.00	29.40	30.00			
R.L. (m.a.s.l)		93.85	93.45						90.35																											63.85	
WATER LEVEL AND DATE																																					
CEMENTED CLEANED OUT																																					
CASING DURING DRILLING																																					
Ø OF CORE		Ø 59.2 mm.		Ø 55 mm.		Ø 59.2 mm		Ø 55 mm																													
DRILLING METHOD		DRY DRILLING		WATER FLUSH		DRY		WATER FLUSH.																													

Remarks :

DRILLING REPORT

HOLE No.: B.8.

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS. 4.

CO-ORDINATES : N. 2094.35.
E 2071.98.

R.L. GROUND SURFACE (m.d.s.l) : +79.91 m.

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.d.s.l) : +39.91 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m.

SCALE : 1 : 100.

Contractor : PT.WIRATMAN & Ass. Driller : KASINUN.

Drilling rig : TONE TASS 3E. Started : AUGUST 28. 1982.

Finished : SEPTEMBER 5. 1982. Logged by :

Date : SEPTEMBER 6. 1982. Checked by :

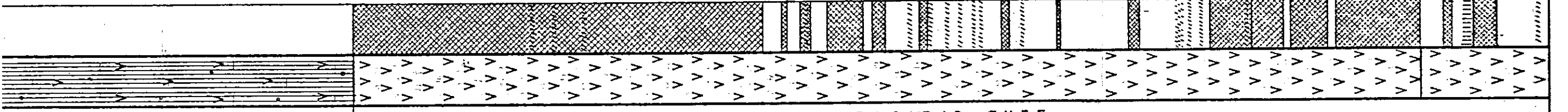
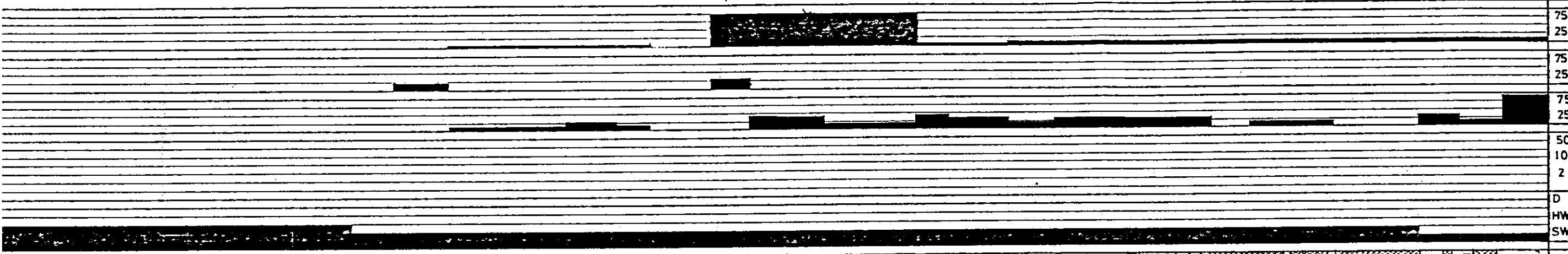
Remarks :

TESTS		WATER PRESSURE TESTS (kg/cm ²)																													
LUGEON UNITS		0.5	1.0	0.5	1.0	0.5																									
			k=8.03 x 10 ⁻⁵		k=5.87 x 10 ⁻⁵																										
			k=1.869 x 10 ⁻⁴		k=6.77 x 10 ⁻⁵																										
			k=6.69 x 10 ⁻⁵		k=4.97 x 10 ⁻⁵																										
					k=1.47 x 10 ⁻⁴																										
					k=2.07 x 10 ⁻⁴																										
					k=1.09 x 10 ⁻⁴																										
					k=4.93 x 10 ⁻⁴																										
					k=5.33 x 10 ⁻⁴																										
					k=4.47 x 10 ⁻⁴																										
ROCK CLASSIFICATION		D																													
HARDNESS																															
RELATIVE DENSITY																															
CONSISTENCY		FIRM TO HARD																													
CORE BARREL	S.T.C.B																														
	D.T.C.B																														
	T.T.C.B																														
DRILL WATER LOSS %	100																														
CORE LOSS %	180																														
R.Q.D %	100																														
FRACTURE LOG	20																														
WEATHERING	CW																														
	MW																														
	F																														
STRUCTURES																															
DIAGRAM																															
LAYER TYPE		RESIDUAL SOIL																													
GEOLOGICAL DESCRIPTION		<p>Highly weathered dacitic tuff represents clayey silt, gravelly, sandy, brown, light grey, firm to hard, slightly plastic.</p> <p>Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed, broken core, commonly limonitic in filled.</p> <p>Inclined joint shown on depth: (15.70, 16.20, 16.90, 22.30, 24.60, 25.30, 25.70, 26.00, 26.30, 26.50, 27.50, 31.20, 31.25, 31.35, 31.50, 31.80, 32.90) m.</p> <p>Broken core shown on depth: (11.40 - 21.25, 21.70 - 21.60, 22.15 - 22.60)</p>																													
DRILLED LENGTH (m)	0.00	0.50	1.30	2.00	2.60	3.00	3.60	4.70	5.00	5.60	6.60	6.90	7.65	8.30	9.00	9.50	10.00	10.60	11.40	12.40	13.70	15.00	16.50	17.00	17.70	18.50	20.00	21.00	21.70	22.60	
R.L. (m.d.s.l)	+79.91																			+68.51											
WATER LEVEL AND DATE											28.8/82	5.9/82	30.8/82	31.8/82	30.3/82	9.11/82	31.8/82	1.9/82	4.9/82	5.9/82											
CEMENTED CLEANED OUT CASING DURING DRILLING																															
Ø OF CORE		Ø 59.2mm										Ø 55 mm.										Ø 59.2mm									
DRILLING METHOD		DRY DRILLING										WATER FLUSH										DRY									

$k=8.03 \times 10^{-5}$	$k=5.87 \times 10^{-5}$	$k=1.47 \times 10^{-4}$	$k=4.93 \times 10^{-4}$	$k=7.22 \times 10^{-5}$	$k=1.84 \times 10^{-5}$	$k=8.38 \times 10^{-6}$
$k=1.869 \times 10^{-4}$	$k=6.77 \times 10^{-5}$	$k=2.07 \times 10^{-4}$	$k=5.33 \times 10^{-4}$	$k=8.79 \times 10^{-5}$	$k=3.69 \times 10^{-5}$	$k=8.38 \times 10^{-6}$
$k=6.69 \times 10^{-5}$	$k=4.97 \times 10^{-5}$	$k=1.09 \times 10^{-4}$	$k=4.47 \times 10^{-4}$	$k=6.28 \times 10^{-5}$	$k=6.14 \times 10^{-5}$	$k=2.79 \times 10^{-6}$

12.5
7.5
2.5

D	CL	D	CL	C _M near CL	CL	C _M	CL	C _M
FIRM TO HARD								
S.T.C.B		D.T.C.B		S.T.C.B		D.T.C.B		



RESIDUAL SOIL

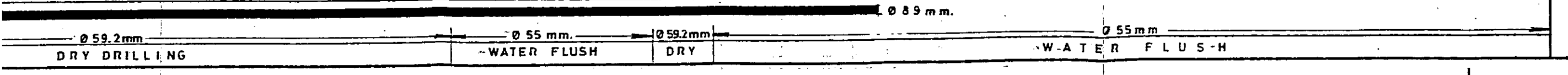
Highly weathered dacitic tuff, represents clayey silt, gravelly, sandy, brown, light grey, firm to hard, slightly plastic.

DACITIC TUFF

Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed, broken core, commonly limonitic infilled. Inclined joint shown on depth: (15.70, 16.20, 16.90, 22.30, 24.80, 25.30, 25.70, 26.00, 26.30, 26.50, 27.50, 31.20, 31.25, 31.35, 31.50, 31.80, 32.90) m. Broken core shown on depth: (11.40-21.25, 21.70-21.80, 22.15-22.40, 22.80-23.70, 23.90-24.20, 25.00-25.20, 27.00-27.20, 28.30-28.40, 30.00-30.30, 32.00-33.00, 33.00-33.80, 33.90-34.80, 35.00-37.00) m.

Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core. Inclined joint shown on depth: 39.80m. Vertical joint shown on depth: 38.00-38.20m. Broken core shown on depth: (37.60-37.80, 38.30-38.90)m.

3.80	4.70	5.00	5.60	6.60	6.90	7.65	8.30	9.00	9.50	10.00	10.60	11.40	12.40	13.70	15.00	16.50	17.00	17.70	18.50	20.00	21.00	21.70	22.80	23.70	25.00	25.80	27.20	28.30	29.00	30.00	30.60	32.00	33.40	34.00	35.00	36.50	37.00	38.00	39.00	40.00		
												+68.51																			+42.91											+39.91
												28.832																			5.932											30.882
												31.882																			9.1182											31.882
												30.882																			1.932											4.982
												5.932																			5.932											



675
360

$k=1.83 \times 10^{-5}$	$k=4.38 \times 10^{-4}$	$k=2.13 \times 10^{-4}$	$k=0.937 \times 10^{-4}$	$k=1.07 \times 10^{-3}$	$k=2.67 \times 10^{-4}$	$k=7.98 \times 10^{-4}$	$k=9.9 \times 10^{-4}$
$k=3.65 \times 10^{-5}$	$k=6.107 \times 10^{-4}$	$k=2.99 \times 10^{-4}$	$k=1.53 \times 10^{-4}$	$k=1.44 \times 10^{-3}$	$k=7.01 \times 10^{-4}$	$k=1.54 \times 10^{-3}$	$k=1.3 \times 10^{-3}$
$k=3.04 \times 10^{-5}$	$k=0.679 \times 10^{-4}$	$k=2.45 \times 10^{-4}$	$k=1.36 \times 10^{-4}$	$k=1.16 \times 10^{-3}$	$k=5.01 \times 10^{-4}$	$k=1.18 \times 10^{-3}$	$k=8.3 \times 10^{-4}$

12.5
7.5
2.5

CH

CL

CM

CL

CM

CL

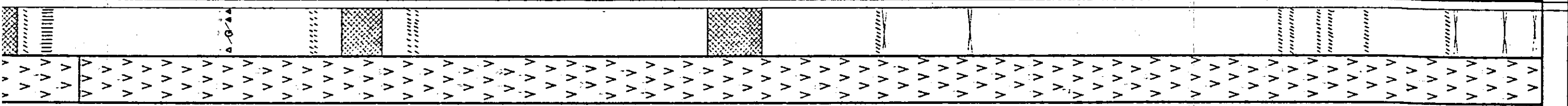
CM

CH

H A R D

D.T.C.B / DIAMOND BITS

75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TUFF

Vertical joint shown on depth:
(8.70 - 9.00, 12.00-12.30) m.
Broken core shown on depth:
(9.50 - 11.45) m.

Slightly weathered dacitic tuff,
grey, strongly cemented, hard,
fractured, jointed, broken core.
Inclined joint shown on depth:
(18.80, 18.90, 21.30, 21.50, 33.25,
43.45, 43.75, 44.40, 44.70, 45.60,
47.60) m.
Cross joint shown on depth:
(33.40, 35.50, 47.80, 49.80,
49.05) m.
Broken core shown on depth:
(19.60 - 20.65, 28.90 - 30.30) m.
Irregular quartz vein showing
brecciated structure, found on
depth: 16.60 - 16.80 m.

12.30	12.95	13.00	14.00	15.00	16.60	17.20	17.90	18.90	20.00	20.45	20.75	21.30	21.50	23.00	23.40	24.15	25.00	25.90	26.25	26.70	27.35	28.30	29.30	29.60	30.30	30.70	31.20	31.50	32.20	33.75	34.15	34.65	35.00	35.40	36.27	37.40	38.70	39.30	40.00	41.20	41.90	43.45	43.67	45.00	46.25	47.25	48.20	49.00	50.00				
46.79																																																			49.74		

Ø 55 mm.	Ø 55.2 mm.	Ø 89 mm.	Ø 55 mm.
WATER FLUSH			WATER FLUSH

DRILLING REPORT

HOLE No.: B.10

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 4.

CO-ORDINATES : N 2117.57.
E 1896.11.

R.L GROUND SURFACE (m.d.s.l) : +45.70 m.

DEVIATION FROM VERTICAL: 0°

R.L BOTTOM OF HOLE (m.d.s.l) : -4.30 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : SUJIMAN.

Drilling rig : TONE TASS 3E. Started: SEPTEMBER 27. 1982.

Finished : OCTOBER 10. 1982. Logged by :

Date : OCTOBER.11.1982. Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)		154																				
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k = 4.16 \times 10^{-4}$	$k = 2.3 \times 10^{-5}$	$k = 2.1 \times 10^{-5}$	$k = 7.1 \times 10^{-5}$																
	1.0		$k = 5.9 \times 10^{-4}$	$k = 7.0 \times 10^{-5}$	$k = 3.2 \times 10^{-5}$	$k = 3.9 \times 10^{-5}$																
	0.5		$k = 3.8 \times 10^{-4}$	$k = 4.6 \times 10^{-5}$	$k = 6.4 \times 10^{-6}$	$k = 4.7 \times 10^{-5}$																
	10	LUGEON UNITS																				
5																						
0																						
ROCK CLASSIFICATION		D	CL	CM	CH	CM	H															
HARDNESS																						
RELATIVE DENSITY																						
CONSISTENCY		SOFT	FIRM TO HARD																			
CORE BARREL	S.T.C.B	S.T.C.B																				
	D.T.C.B																					
	T.T.C.B	T.T.C.B/STEEL BITS																				
DRILL WATER LOSS %		100																				
CORE LOSS %		100																				
R.Q.D %		100																				
FRACTURE LOG		20																				
WEATHERING		CW																				
STRUCTURES			FE																			
DIAGRAM			V V	V V	V V	V V	V V															
LAYER TYPE			RESIDUAL SOIL																			
GEOLOGICAL DESCRIPTION			Completely weathered dacitic tuff represents silty clay, brown, soft, plastic. Highly weathered dacitic tuff represents clayey silt, brown, grey, firm to hard, slightly plastic. Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed, broken core, limonitic infilled. Inclined joint shown on depth: (5.50, 7.40)m. Broken core shown on depth: (4.10-4.25, 5.55-5.80, 6.40-6.80, 8.00-8.60)m. Limonitic infilled shown on depth: (4.00-5.20, 6.40-6.80, 8.20-8.60)m.																			
DRILLED LENGTH (m)		0.00	0.50	2.00	4.10	5.80	6.80	8.30	9.00	10.00	11.55	13.00	14.40	15.00	16.00	16.75	18.25	19.75	20.00	21.50	23.00	
R.L (m.d.s.l)		+45.70	+44.90	+42.25	+36.70																	
WATER LEVEL AND DATE		10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82	10.10.82
CEMENTED CLEANED OUT CASING DURING DRILLING																						
Ø OF CORE			Ø 59.2mm																			
DRILLING METHOD			DRY DRILLING																			

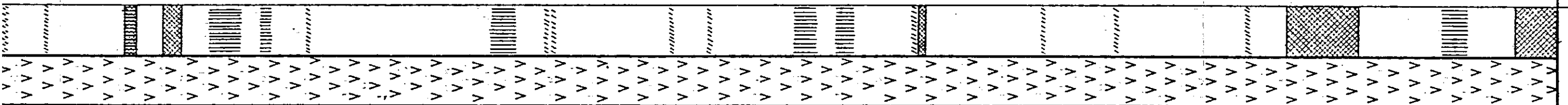
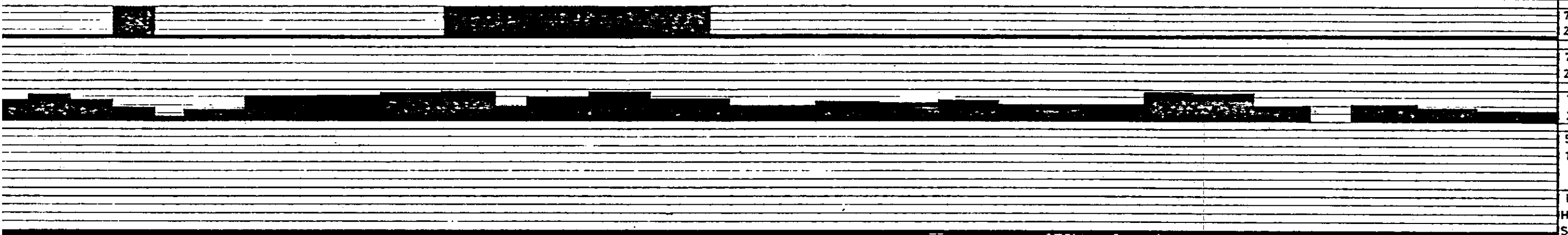
$\times 10^{-5}$	$k = 2.1 \times 10^{-5}$	$k = 7.1 \times 10^{-5}$	$k = 0$	$k = 6.7 \times 10^{-6}$	$k = 1.4 \times 10^{-6}$	$k = 1.0 \times 10^{-4}$	$k = 3.3 \times 10^{-4}$
$\times 10^{-5}$	$k = 3.2 \times 10^{-5}$	$k = 3.9 \times 10^{-4}$	$k = 1.3 \times 10^{-4}$	$k = 2.7 \times 10^{-5}$	$k = 2.8 \times 10^{-5}$	$k = 2.1 \times 10^{-4}$	$k = 4.5 \times 10^{-4}$
$\times 10^{-5}$	$k = 6.4 \times 10^{-6}$	$k = 4.7 \times 10^{-5}$	$k = 0$	$k = 0$	$k = 7.1 \times 10^{-6}$	$k = 3.6 \times 10^{-5}$	$k = 3.3 \times 10^{-4}$

12.5
7.5
2.5

CH	CM	CH	CM	CH	CL	CM	CL near CM
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- H A R D

T.T.C.B / DIAMOND BITS



DACITIC TUFF

Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core, inclined joint shown on depth: (12.40, 12.45, 13.40, 19.80, 25.50, 25.70, 28.55, 28.50, 34.40, 37.60, 39.30, 42.50) m.
Vertical joint shown on depth: (9.20-9.60, 15.30-15.60, 17.40-18.10, 18.60-18.85, 24.20-24.75, 31.60-32.10, 32.60-33.00, 47.20-47.80) m.
Broken core shown on depth: (15.30-15.60, 16.25-16.70, 34.50-34.70, 43.50-45.20, 49.00-50.00) metres.

13.00	14.40	15.00	16.00	16.75	18.25	19.75	20.00	21.50	23.00	24.25	25.00	26.50	28.00	29.50	30.00	30.70	32.10	33.60	34.25	35.00	36.50	37.30	38.50	40.00	41.15	42.65	43.90	45.00	46.55	48.00	49.30	50.00
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

- 4.30

0.52 m
WATER FLUSH

DRILLING REPORT

HOLE No : B.11

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 4.

CO-ORDINATES : N . 2144.12.
E . 1896.70.

R.L GROUND SURFACE (m.d.s.l) : +45.71 m.

DEVIATION FROM VERTICAL : 45°

R.L BOTTOM OF HOLE (m.d.s.l) : +17.43 m.

DIRECTION : SOUTH WEST

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m.

SCALE : 1 : 100.

Contractor : PT.WIRATMAN & Ass. Driller : SUGINO.

Started : SEPTEMBER 23.1982.

Finished : OCTOBER 1.1982. Logged by :

Date : OCTOBER 2.1982.

Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)		397																																		
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k=3.0 \times 10^{-4}$	$k=6.2 \times 10^{-3}$	$k=1.1 \times 10^{-4}$	$k=1.1 \times 10^{-4}$	$k=2.8 \times 10^{-4}$	$k=3.5 \times 10^{-4}$	$k=5.6 \times 10^{-4}$																											
	1.0		$k=6.6 \times 10^{-4}$	$k=1.7 \times 10^{-3}$	$k=4.8 \times 10^{-4}$	$k=3.6 \times 10^{-4}$	$k=6.1 \times 10^{-4}$	$k=9.2 \times 10^{-4}$	$k=1.5 \times 10^{-3}$																											
	0.5		$k=5.2 \times 10^{-4}$	$k=1.1 \times 10^{-3}$	$k=8.6 \times 10^{-5}$	$k=1.9 \times 10^{-4}$	$k=3.0 \times 10^{-4}$	$k=3.5 \times 10^{-4}$	$k=3.5 \times 10^{-4}$																											
LUGEON UNITS		10																																		
ROCK CLASSIFICATION			D	C _L		C _M		C _H																												
HARDNESS			H A R D																																	
RELATIVE DENSITY																																				
CONSISTENCY			STIFF TO HARD																																	
CORE BARREL	S.T.C.B	S.T.C.B																																		
	D.T.C.B																																			
	T.T.C.B		T.T.C.B / DIAMOND BITS																																	
DRILL WATER LOSS %	100																																			
CORE LOSS %	100																																			
R. Q. D. %	100																																			
FRACTURE LOG	20																																			
WEATHERING	CW																																			
STRUCTURES																																				
DIAGRAM																																				
LAYER TYPE		RESIDUAL SOILS DACITIC TUFF																																		
GEOLOGICAL DESCRIPTION		<p>Highly weathered dacitic tuff represents clayey silt, brown, light brown, yellowish brown, stiff to hard, slightly plastic.</p> <p>Moderately weathered dacitic tuff, grey spotted brown, weakly cemented, hard, fractured jointed, broken core.</p> <p>Inclined joint shown on depth: 4.20 m.</p> <p>Vertical joint shown on depth: 2.80-4.20 m.</p> <p>Broken core shown on depth: 0.30-3.40 m.</p>																																		
DRILLED LENGTH (m)	0.00	0.70	0.70	0.80	1.30	1.90	2.50	2.90	3.40	3.70	4.12	4.70	5.45	6.90	7.80	8.35	9.28	10.50	10.90	11.32	12.15	13.26	13.53	14.78	15.00	16.45	17.55	18.98	20.00	21.50	21.75	22.81	23.30	23.79		
R.L (m.d.s.l)	+45.71	+45.50										+42.39																								
WATER LEVEL AND DATE																																				
CEMENTED CLEANED OUT																																				
CASING DURING DRILLING																																				
Ø OF CORE		Ø 59.2mm																																		
DRILLING METHOD		DRY DRILLING																																		

WATER F L U S

$k=3.0 \times 10^{-4}$	$k=6.2 \times 10^{-3}$	$k=1.1 \times 10^{-4}$	$k=1.1 \times 10^{-4}$	$k=2.8 \times 10^{-4}$	$k=3.5 \times 10^{-4}$	$k=5.6 \times 10^{-4}$	$k=2.2 \times 10^{-4}$	$k=7.1 \times 10^{-4}$	$k=1.3 \times 10^{-3}$	$k=1.8 \times 10^{-4}$	-
$k=6.6 \times 10^{-4}$	$k=1.7 \times 10^{-3}$	$k=4.8 \times 10^{-4}$	$k=3.6 \times 10^{-4}$	$k=6.1 \times 10^{-4}$	$k=9.2 \times 10^{-4}$	$k=1.5 \times 10^{-3}$	$k=9.8 \times 10^{-4}$	$k=1.8 \times 10^{-3}$	$k=2.1 \times 10^{-3}$	$k=9.1 \times 10^{-4}$	-
$k=5.2 \times 10^{-4}$	$k=1.1 \times 10^{-3}$	$k=8.6 \times 10^{-5}$	$k=1.9 \times 10^{-4}$	$k=3.0 \times 10^{-4}$	$k=3.5 \times 10^{-4}$	$k=3.5 \times 10^{-4}$	$k=5.7 \times 10^{-4}$	$k=1.0 \times 10^{-3}$	$k=1.1 \times 10^{-3}$	$k=9.7 \times 10^{-5}$	$k=7.9 \times 10^{-4}$

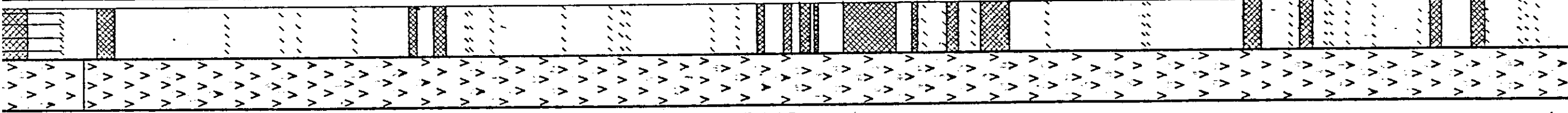
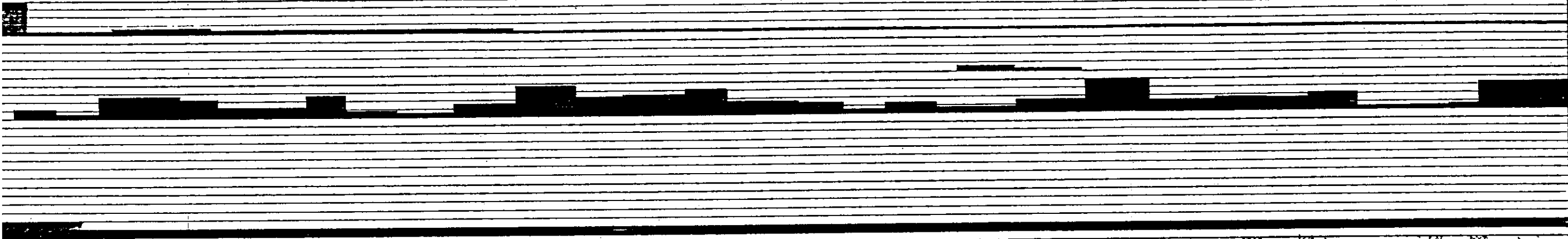
125
7.5
2.5

C _L	C _M	C _H	C _L	C _H	C _L	C _M	C _L	C _H
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H A R D

T.T.C.B / DIAMOND BITS

75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TUFF

Jointed, broken core.
Inclined joint shown on depth:
4.20 m.
Vertical joint shown on depth:
2.80-4.20 m.
Broken core shown on depth:
0.30-3.40 m.

Slightly weathered dacitic
tuff, grey, slightly cemented,
hard, fractured, jointed, broken
core.
Inclined joint shown on depth:
(17.15, 17.50, 7.60, 8.10, 9.40, 9.80,
11.10, 13.80, 13.90, 14.40, 16.10, 17.60,
19.60, 20.20, 24.70, 25.15, 25.85,
27.60, 29.90, 31.01, 33.40, 34.30,
34.40, 34.80, 35.40, 36.50, 38.10,
38.90, 39.05, 39.30) m.
Broken core shown on depth:
(5.00-5.45, 12.40-12.60, 13.00-13.30,
20.70-20.85, 21.35-21.50, 21.70-
21.90, 22.00-22.10, 22.75-24.00,
24.40-24.50, 25.20-25.50, 26.00-
26.70, 32.30-32.70, 33.60-33.90,
36.75-37.00, 37.70-38.00) m.

3.40	3.70	4.12	4.70	5.45	6.90	7.80	8.35	9.28	10.50	10.90	11.32	12.15	13.26	13.53	14.78	15.00	16.45	17.55	18.98	20.00	21.50	21.75	22.10	22.81	23.20	23.79	25.00	25.50	26.90	28.45	30.00	31.55	32.75	33.77	35.00	35.60	36.25	37.13	37.90	39.50	40.00
------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

17.43

Ø 89 mm.

Ø 52 mm
WATER FLUSH

S : F c (Kg/cm ²)		k = 5.3 x 10 ⁻⁵		k = 7.1 x 10 ⁻⁵		k = 1.5 x 10 ⁻⁵		k = 1.6 x 10 ⁻⁵	
0.5		k = 5.3 x 10 ⁻⁵		k = 1.7 x 10 ⁻⁴		k = 2.3 x 10 ⁻⁵		k = 1.6 x 10 ⁻⁵	
1.0		k = 4.7 x 10 ⁻⁵		k = 1.2 x 10 ⁻⁴		k = 2.7 x 10 ⁻⁵		k = 8.1 x 10 ⁻⁶	
0.5									
12.5									
7.5									
2.5									
10									
5									
0									
D		CL CM		CL CM		CL CH		CL CH	
H A R D									
SOFT		STIFF TO HARD							
S.T.C.B		S.T.C.B		DIAMOND BITS		D.T.C.B		D.B S	
D.T.C.B		D.T.C.B		D.T.C.B		D.T.C.B		D.T.C.B	
T.T.C.B		T.T.C.B		T.T.C.B		T.T.C.B		T.T.C.B	
100									
50									
0									
100									
50									
0									
20									
4									
1									
CW									
MW									
E									
RESIDUAL SOIL		DACITIC TUFF							
GEOLOGICAL DESCRIPTION		GEOLOGICAL DESCRIPTION		GEOLOGICAL DESCRIPTION		GEOLOGICAL DESCRIPTION		GEOLOGICAL DESCRIPTION	
CORRECTED LENGTH (m)		CORRECTED LENGTH (m)		CORRECTED LENGTH (m)		CORRECTED LENGTH (m)		CORRECTED LENGTH (m)	
m.a.s.l)		m.a.s.l)		m.a.s.l)		m.a.s.l)		m.a.s.l)	
DR LEVEL AND DATE		DR LEVEL AND DATE		DR LEVEL AND DATE		DR LEVEL AND DATE		DR LEVEL AND DATE	
CLEANED OUT		CLEANED OUT		CLEANED OUT		CLEANED OUT		CLEANED OUT	
DURING DRILLING		DURING DRILLING		DURING DRILLING		DURING DRILLING		DURING DRILLING	
CORE		CORE		CORE		CORE		CORE	
DRILLING METHOD		DRILLING METHOD		DRILLING METHOD		DRILLING METHOD		DRILLING METHOD	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40
5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20
5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05
7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30
8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55	10.55
10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
11.80	11.80	11.80	11.80	11.80	11.80	11.80	11.80	11.80	11.80
12.30	12.30	12.30	12.30	12.30	12.30	12.30	12.30	12.30	12.30
12.90	12.90	12.90	12.90	12.90	12.90	12.90	12.90	12.90	12.90
13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70
14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.75
15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90
16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60	16.60
17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20
18.60	18.60	18.60	18.60	18.60	18.60	18.60	18.60	18.60	18.60
18.70	18.70	18.70	18.70	18.70	18.70	18.70	18.70	18.70	18.70
19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00
19.10	19.10	19.10	19.10	19.10	19.10	19.10	19.10	19.10	19.10
19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.50	19.50
20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50
21.90	21.90	21.90	21.90	21.90	21.90	21.90	21.90	21.90	21.90
22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50
23.45	23.45	23.45	23.45	23.45	23.45	23.45	23.45	23.45	23.45
24.70	24.70	24.70	24.70	24.70	24.70	24.70	24.70	24.70	24.70
25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
26.20	26.20	26.20	26.20	26.20	26.20	26.20	26.20	26.20	26.20
27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00
27.30	27.30	27.30	27.30	27.30	27.30	27.30	27.30	27.30	27.30
28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00
28.50	28.50	28.50	28.50	28.50	28.50	28.50	28.50	28.50	28.50
28.70	28.70	28.70	28.70	28.70	28.70	28.70	28.70	28.70	28.70
30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3.

R.L. GROUND SURFACE (m.a.s.l) : +77.40 m.

R.L. BOTTOM OF HOLE (m.a.s.l) : +37.40 m.

TOTAL LENGTH OF DRILL HOLE (m.) : 40.00 m.

CO-ORDINATES : N 1907.93
E 2033.97

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL.

SCALE : 1 : 100.

Contractor : P.T. WATMAN & Ass. Driller : SUGINO.

Drilling rig : YBM YSO 1. Started : SEPTEMBER 7, 1982.

Finished : SEPTEMBER 12, 1982. Logged by :

Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)		535																									
WATER PRESSURE TESTS (kg/cm ²)	0.5			k=0	k=4.3 x 10 ⁻⁴	k=1.0 x 10 ⁻³																					
	1.0			k=4.8 x 10 ⁻⁵	k=6.5 x 10 ⁻⁴	k=1.4 x 10 ⁻³																					
	0.5	k=9.3 x 10 ⁻⁵		k=2.4 x 10 ⁻⁵	k=3.9 x 10 ⁻⁴	k=1.2 x 10 ⁻³																					
LUGEON UNITS		10																									
ROCK CLASSIFICATION		D		CL	CM	CH																					
HARDNESS						H A R D																					
RELATIVE DENSITY																											
CONSISTENCY																											
CORE BARREL	S.T.C.B	STCB																									
	D.T.C.B					D.T.C.B																					
	T.T.C.B																										
DRILL WATER LOSS %	100																										
CORE LOSS %	100																										
R.Q.D %	100																										
FRACTURE LOG	20																										
WEATHERING	CW																										
STRUCTURES																											
DIAGRAM																											
LAYER TYPE	RESIDUAL SOIL					DACITIC TUFF																					
GEOLOGICAL DESCRIPTION	TOP SOIL: Humus dark brown, mostly roots fragments. Highly weathered dacitic tuff, represents clayey silt, gravelly, hard, slightly plastic, moist.			Moderately weathered dacitic tuff, grey and brown, weakly cemented, hard, fractured, jointed, broken core, limonite infilled. Inclined joint shown on depth: (4.85; 9.70; 9.80; 10.00; 11.80; 13.60; 14.40; 15.30) m vertical joint shown on depth: (3.70 - 4.00) m broken core shown on depth: (1.70-2.70; 3.20-3.45; 5.55-6.25; 6.30-6.60; 7.00-7.25; 7.90-8.50; 11.00-11.35; 12.35-12.90; 16.10-16.20; 16.85-17.00; 17.30-17.50; 17.70-17.90;) m limonite vein shown on depth: (1.70-2.70; 3.20-3.45; 3.70-8.50; 9.20; 9.35-9.45; 9.70; 9.80; 10.20-10.40; 11.60; 11.80; 12.35-13.00; 13.50-13.60; 14.30-14.40; 14.70-15.00; 16.10-16.20; 16.80-17.05; 17.30-17.50; 17.70-17.90) m																							
DRILLED LENGTH (m)	0.00	0.40	0.65	1.11	1.47	1.50	2.47	3.47	4.67	5.50	6.50	7.00	8.50	10.00	11.00	12.10	13.10	14.00	15.00	16.55	18.00	19.50	20.00	21.37	22.90	23.70	
R.L (m.a.s.l)																											
WATER LEVEL AND DATE								7.9.82	12.9.82	11.9.82	8.9.82	8.9.82	10.9.82	17.9.82	9.9.82												
CEMENTED CLEANED OUT																											
CASING DURING DRILLING																											
Ø OF CORE	Ø 59.2 mm																										
DRILLING METHOD	DRY																										

WATER FLUSH

535

405
314

	$k=0$	$k=4.3 \times 10^{-4}$	$k=1.0 \times 10^{-3}$	$k=0$	$k=0$	$k=0$
	$k=4.8 \times 10^{-5}$	$k=6.5 \times 10^{-4}$	$k=1.4 \times 10^{-3}$	$k=3.8 \times 10^{-5}$	$k=2.4 \times 10^{-5}$	$k=5.0 \times 10^{-7}$
$k=9.3 \times 10^{-5}$	$k=2.4 \times 10^{-5}$	$k=3.9 \times 10^{-4}$	$k=1.2 \times 10^{-3}$	$k=5.7 \times 10^{-5}$	$k=1.5 \times 10^{-6}$	$k=4.1 \times 10^{-6}$

12.5
7.5
2.5

CL

CM

CH

CM

CH

H - A - R - D

D.T.C.B

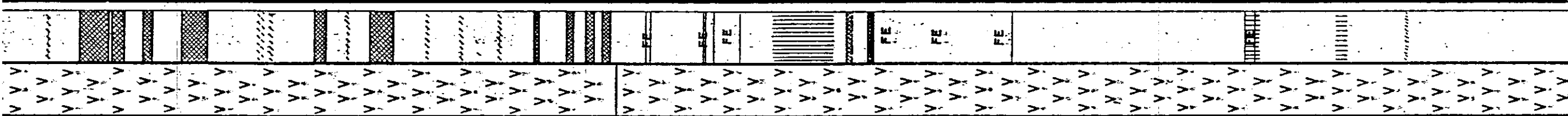
75
25

75
25

75
25

50
10
2

D
HW
SW



D A C I T I C T U F F

Moderately weathered dacitic tuff, grey and brown, weakly cemented, hard, fractured, jointed, broken core, limonitic infilled.

Inclined joint shown on depth:
(4.85; 9.70; 9.80; 10.00; 11.80; 13.60; 14.40; 15.30) m

vertical joint shown on depth:
(3.70 - 4.00) m

broken core shown on depth:
(1.70-2.70; 3.20-3.45; 5.55-6.25; 6.30-6.60; 7.00-7.25; 7.90-8.50; 11.00-11.35; 12.35-12.90; 16.10-16.20; 16.85-17.00; 17.30-17.50; 17.70-17.90;) m

limonitic vein shown on depth:
(1.70-2.70; 3.20-3.45; 3.70-8.50; 9.20; 9.35-9.45; 9.70; 9.80; 10.20-10.40; 11.60; 11.80; 12.35-13.00; 13.50-13.60; 14.30-14.40; 14.70-15.00; 16.10-16.20; 16.80-17.00; 17.30-17.50; 17.70-17.90) m

Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core, limonitic infilled, inclined joint shown on depth:
(36.40 m

vertical joint shown on depth:
(21.00-23.10; 32.60-32.90; 34.70-34.90) m

broken core shown on depth:
(23.40-23.55; 23.90-24.00) m

limonitic vein shown on depth:
(18.65-18.75; 20.00-20.05; 20.30; 20.90; 23.95; 27.20; 32.60-32.80) m

4.87	5.50	6.50	7.00	8.50	10.00	11.00	12.10	13.10	14.00	15.00	16.55	18.00	19.50	20.00	21.37	22.90	23.70	24.32	25.00	25.50	27.00	28.43	30.00	31.50	33.00	34.30	35.00	36.00	37.00	38.65	40.00
------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

7.9.82
12.9.82
11.9.82
8.9.82
7.9.82
10.9.82
12.9.82
9.9.82

ø 89 mm.

ø 55 mm.

ø 52 mm.

W A T E R F L U S H

DRILLING REPORT

HOLE No.: B.14

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3.

R.L GROUND SURFACE (m.a.s.l) : +51.28 m.

R.L BOTTOM OF HOLE (m.a.s.l) : + 1.28 m.

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m.

CO-ORDINATES : N 1907.73.
E 2012.37.

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : SUGINO.

Drilling rig : YBM YSO 1. Started: AUGUST 29. 1982.

Finished : SEPTEMBER 5. 1982. Logged by :

Date : Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)		637																									
WATER PRESSURE TESTS (kg/cm ²)			-	$k = 5.5 \times 10^{-7}$	$k = 1.2 \times 10^{-5}$	$k = 1.8 \times 10^{-5}$																					
			-	$k = 1.1 \times 10^{-5}$	$k = 2.5 \times 10^{-5}$	$k = 8.4 \times 10^{-5}$																					
			$k = 7.4 \times 10^{-4}$	$k = 1.1 \times 10^{-5}$	$k = 1.2 \times 10^{-5}$	$k = 8.9 \times 10^{-5}$																					
LUGEON UNITS	10																										
ROCK CLASSIFICATION		D	CL		C _M	CL																					
HARDNESS																											
RELATIVE DENSITY																											
CONSISTENCY		FIRM TO HARD																									
CORE BARREL	S.T.C.B	S.T.C.B																									
	D.T.C.B																										
	T.T.C.B																										
DRILL WATER LOSS %	100																										
CORE LOSS %	100																										
R. Q. D %	100																										
FRACTURE LOG	20																										
	4																										
	1																										
WEATHERING	CW																										
	MW																										
	F																										
STRUCTURES																											
DIAGRAM																											
LAYER TYPE		RESIDUAL SOIL																									
GEOLOGICAL DESCRIPTION		Highly weathered dacitic tuff represent of clayey silt, gravelly, sandy, brown and grey, firm to hard, slightly plastic.																									
		Moderately weathered dacitic tuff, grey and brown, weakly cemented, hard, fractured, jointed, broken core, limonitic infilled.																									
		Inclined joint shown on depth: (5.90, 6.40, 6.05, 11.20, 12.40, 16.36, 16.60, 16.75, 16.90, 17.50) m.																									
		Vertical joint shown on depth: (15.00-15.70, 18.00-18.75, 19.00-20.40) m.																									
		Broken core shown on depth: (1.90-3.65, 4.00-5.80, 7.15-7.60, 8.30-8.60, 8.80-9.00, 10.40-10.70, 12.15-12.30, 13.00-14.40, 18.00-18.30, 19.00-20.40) m.																									
	DRILLED LENGTH (m)	0.00	0.40	0.80	1.50	1.90	2.30	3.10	3.80	4.70	5.20	6.00	7.40	9.30	10.00	10.60	11.40	12.30	13.90	15.00	15.70	17.00	18.30	19.00	20.00	20.40	
	R.L (m.a.s.l)	+51.28		+49.38																							+30.88
	WATER LEVEL AND DATE													2.9.82	30.8.82	9.11.82	31.8.82	3.9.82									
	CEMENTED CLEANED OUT CASING DURING DRILLING																										
	Ø OF CORE		Ø 59.2 mm. Ø 89 mm. Ø 55 mm.																								
	DRILLING METHOD		DRY																								

WATER FLUSH

	637						368 152
0-7	$k=1.2 \times 10^{-5}$	$k=1.8 \times 10^{-5}$	$k=1.4 \times 10^{-4}$	$k=4.2 \times 10^{-6}$	$k=7.0 \times 10^{-5}$	$k=8.6 \times 10^{-7}$	$k=4.1 \times 10^{-6}$
0-5	$k=2.5 \times 10^{-5}$	$k=8.4 \times 10^{-5}$	$k=9.7 \times 10^{-5}$	$k=7.6 \times 10^{-6}$	$k=1.0 \times 10^{-4}$	$k=2.1 \times 10^{-5}$	$k=8.3 \times 10^{-6}$
0-5	$k=1.2 \times 10^{-5}$	$k=8.9 \times 10^{-5}$	$k=1.2 \times 10^{-4}$	$k=5.0 \times 10^{-6}$	$k=1.0 \times 10^{-4}$	$k=2.1 \times 10^{-6}$	$k=6.2 \times 10^{-6}$

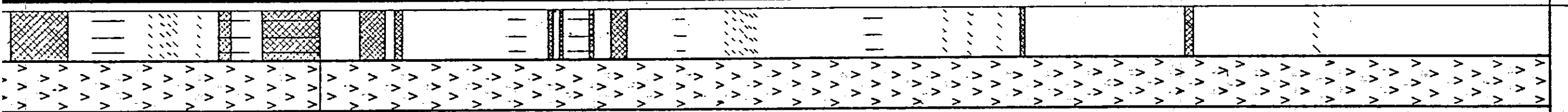
12.5
7.5
2.5

C _M	CL	C _M	C _H
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H A R D

D.T.C.B / DIAMOND BITS

75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TUFF

(1.90 - 3.65, 4.00 - 5.90, 7.15 - 7.60, 8.30 - 8.60, 8.80 - 9.00, 10.40 - 10.70, 12.15 - 12.30, 13.00 - 14.40, 18.00 - 18.30, 19.00 - 20.40) m.

Slightly weathered dacitic tuff, gray, strongly cemented, hard, fractured, jointed, broken core.
 Inclined joint shown on depth: 30.30, 30.45, 30.60, 30.70, 30.80, 30.90, 35.50, 36.05, 36.80, 44.40) m.
 Vertical joint shown on depth: (25.00 - 25.40, 26.40 - 27.00, 29.00 - 29.20, 33.60 - 34.00) m.
 Broken core shown on depth: 21.40 - 22.00, 22.20 - 22.40, 25.90 - 26.00, 26.15 - 26.20, 26.90 - 27.00, 27.40 - 27.80, 37.30 - 37.40, 41.30 - 41.48) m.

13.90	15.00	15.70	17.00	18.30	19.00	20.00	20.40	25.00	26.40	27.20	27.60	29.00	30.00	31.50	32.70	34.25	35.00	35.80	37.40	38.80	40.00	41.50	43.00	43.90	45.00	46.55	48.00	49.50	50.00

30.88

1.28

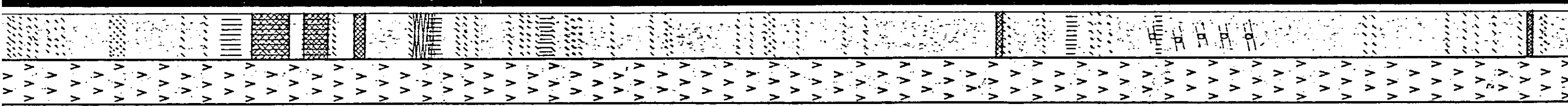
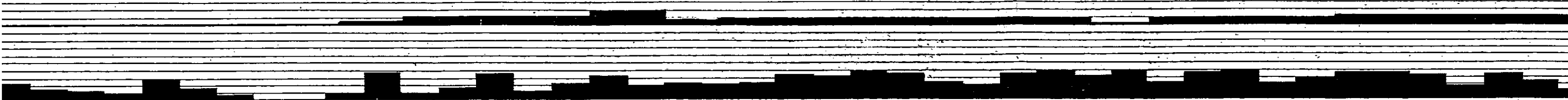
Ø 55 mm.
WATER FLUSH

$k=8.5 \times 10^{-4}$	$k=1.2 \times 10^{-3}$	$k=1.6 \times 10^{-3}$	$k=7.0 \times 10^{-4}$	$k=2.0 \times 10^{-4}$	$k=1.0 \times 10^{-5}$	$k=1.1 \times 10^{-4}$	$k=6.8 \times 10^{-5}$
$k=1.3 \times 10^{-3}$	$k=2.1 \times 10^{-3}$	$k=2.1 \times 10^{-3}$	$k=9.9 \times 10^{-4}$	$k=3.2 \times 10^{-4}$	$k=1.5 \times 10^{-5}$	$k=7.8 \times 10^{-5}$	$k=1.6 \times 10^{-4}$
$k=1.0 \times 10^{-3}$	$k=1.3 \times 10^{-3}$	$k=1.8 \times 10^{-3}$	$k=3.2 \times 10^{-4}$	$k=3.1 \times 10^{-4}$	$k=1.0 \times 10^{-5}$	$k=9.1 \times 10^{-5}$	$k=7.1 \times 10^{-5}$

CM	CH	CL near CM	CH	CM	CH	CM	CH	CM	CH	CL	CH
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H A R D

T.T.C.B / DIAMOND BITS



D A C T I C T U F F

20.00	21.85	23.15	25.00	26.00	26.50	27.30	28.35	30.00	31.00	33.75	35.00	37.00	38.65	40.00	41.60	43.00	45.00	48.40	50.00	51.60	53.00	55.00	57.55	59.25	60.00		
<p>Slightly weathered dacitic tuff, grey strongly cemented, hard, fractured, jointed, broken core. Inclined joint shown on depth: (11.40; 15.55; 15.80; 16.45; 16.75; 17.10; 17.20; 19.50; 19.80; 19.80; 20.00; 20.20; 20.50; 21.20; 21.35; 22.15; 22.20; 22.30; 22.40; 22.50; 24.70; 24.70; 28.20; 30.20; 31.50; 31.75; 32.00; 32.90; 33.20; 33.40; 33.60; 34.00; 34.35; 34.50; 34.70; 35.55; 36.60; 37.00; 37.10; 38.95; 38.30; 39.70; 39.80; 39.95; 40.60; 41.90; 42.40; 46.30; 46.20; 47.15; 48.40; 48.60; 48.95; 55.80; 56.00; 57.95; 58.40; 58.75; 59.25; 59.95; 60.50; 60.60; 62.20; 62.80; 62.90; 64.00; 64.25; 65.20; 66.00; 66.60; 68.85.) m Vertical joint shown on depth: (25.20-25.70; 26.00-27.00; 27.40-28.10; 30.75; 31.00; 33.70-34.00; 47.80-48.00) m 50.15-50.30; 62.70-62.80.) m Cross joint shown on depth: (30.30; 30.40; 30.50; 30.60; 30.70; 63.80; 64.00; 69.20; 69.50.) m Broken core shown on depth: (26.00-27.00; 27.40; 28.00; 28.70; 29.00; 45.90-46.00; 60.10-60.20.) m on depth 50.00-53.00 m rich with Quartz minerals.</p>																											

Ø 52 mm

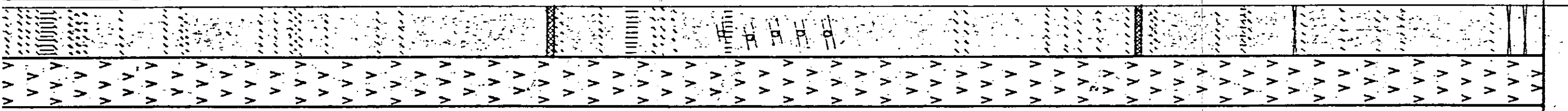
WATER FLUSH

0-3	$k=7.0 \times 10^{-4}$	$k=2.0 \times 10^{-4}$	$k=1.0 \times 10^{-5}$	$k=1.1 \times 10^{-4}$	$k=6.8 \times 10^{-5}$	$k=3.9 \times 10^{-4}$	$k=1.9 \times 10^{-4}$	1,004
10-3	$k=9.9 \times 10^{-4}$	$k=3.2 \times 10^{-4}$	$k=1.5 \times 10^{-5}$	$k=7.8 \times 10^{-5}$	$k=1.6 \times 10^{-4}$	$k=1.0 \times 10^{-3}$	$k=3.1 \times 10^{-4}$	
10-3	$k=3.2 \times 10^{-4}$	$k=3.1 \times 10^{-4}$	$k=1.0 \times 10^{-5}$	$k=9.1 \times 10^{-5}$	$k=7.1 \times 10^{-5}$	$k=8.6 \times 10^{-4}$	$k=2.2 \times 10^{-5}$	

12.5
7.5
2.5

C _M	C _H	C _M	C _H	C _L	C _H	C _M	C _H
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T.C.B / DIAMOND BITS



T U F T

Slightly weathered daltic tuff, grey strongly cemented, hard, fractured, jointed, broken core. Inclined joint shown on depth: (11.40; 15.35; 15.80; 16.45; 16.75; 17.10; 17.20; 19.50; 19.80; 19.60; 20.00; 20.20; 20.50; 21.20; 21.35; 22.15; 22.20; 22.30; 22.40; 22.50; 24.10; 24.70; 28.20; 30.20; 31.50; 31.75; 32.00; 32.90; 33.20; 33.40; 33.60; 34.00; 34.35; 34.50; 34.70; 35.55; 36.60; 37.00; 37.10; 38.95; 39.30; 39.70; 39.80; 39.95; 40.60; 41.90; 42.40; 46.30; 46.20; 47.15; 48.40; 48.60; 48.95; 55.90; 56.00; 57.95; 58.40; 58.75; 59.25; 59.95; 60.50; 60.60; 62.20; 62.80; 62.90; 64.00; 64.25; 65.20; 66.00; 66.60; 68.85.) m
Vertical joint shown on depth: (25.20-25.70; 26.00-27.00; 27.40-28.10; 30.75; 31.00; 33.70-34.00; 42.60-48.00; 50.15-50.30; 62.70-62.80.) m
Cross joint shown on depth: (30.30; 30.40; 30.50; 30.60; 30.70; 63.80; 64.00; 69.20; 69.50.) m
Broken core shown on depth: (26.00-27.00; 27.40-28.00; 28.70-29.00; 45.90-46.00; 60.10-60.20.) m
on depth 50.00-53.00 m rich with Quartz minerals.

3375 3500 3700 38.65 40.00 4160 4300 4500 4600 48.60 50.00 5160 5300 5500 5755 5925 60.00 61.55 62.70 64.00 65.00 68.20 7000

-10.31

FLUSH

DRILLING REPORT

HOLE No: B.16

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3

CO-ORDINATES : N 1901.00
E 1922.50

R.L GROUND SURFACE (m.a.s.l) : +43.10 m

DEVIATION FROM VERTICAL : 60°

R.L BOTTOM OF HOLE (m.a.s.l) : -8.86 m

DIRECTION : NORTH

TOTAL LENGTH OF DRILL HOLE (m) : 60.00 m

SCALE : 1:100

Contractor : PT. WIRATMAN & Ass Driller : Sugino

Drilling rig : TONE TASS 3E Started : October 20, 1982

Finished : November 11, 1982 Logged by:

Date : November 12, 1982 Checked by:

Remarks :

TESTS: \sqrt{c} (Kg/cm ²)																													
WATER PRESSURE TESTS (kg/cm ²)		0.5	$k = 6.9 \times 10^{-5}$	$k = 3.6 \times 10^{-6}$	$k = 8.7 \times 10^{-4}$																								
		1.0	$k = 1.9 \times 10^{-4}$	$k = 2.9 \times 10^{-4}$	$k = 1.1 \times 10^{-3}$																								
		0.5	$k = 1.7 \times 10^{-4}$	$k = 1.1 \times 10^{-4}$	$k = 1.8 \times 10^{-4}$																								
	LUGEON UNITS	10 5 0																											
ROCK CLASSIFICATION			CL	C _M near CL	C _L																								
HARDNESS																													
RELATIVE DENSITY		LOOSE																											
CONSISTENCY																													
CORE BARREL	STCB	STCB																											
	DTCB																												
	TTCB																												
DRILL WATER LOSS %	100 50 0																												
CORE LOSS %	100 50 0																												
R. Q. D %	100 50 0																												
FRACTURE LOG	20 4 1																												
WEATHERING	CW MW F																												
STRUCTURES																													
DIAGRAM																													
LAYER TYPE		SAND & GRAVEL																											
GEOLOGICAL DESCRIPTION		Sand and gravel mixture, brown, grey, fine to coarse grain, well graded, loose, on the upper part (0.00-1.30m depth) mostly gravels. % : Sand : ± 70% Gravel : ± 30%, sub- rounded, average ϕ 0.2-2.5cm maximum ϕ 10cm																											
DRILLED LENGTH (m)	0.00	1.30	2.60	3.60	4.40	5.00	5.45	7.00	7.95	8.80	9.60	10.80	11.40	11.80	12.70	13.70	14.40	15.00	15.95	16.70	17.35	18.22	18.90	20.00	21.25	22.60	23.10		
R.L (m. a. s. l)	43.10									35.46																			
WATER LEVEL AND DATE																													
CEMENTED CLEANED OUT CASING DURING DRILLING																													
Ø OF CORE		Ø 59.2 mm										Ø 89 mm										Ø 55 mm							
DRILLING METHOD		DRY DRILLING																											

Slightly weathered tuff, grey.

	672 419							432
0 ⁻⁴	$k=1.3 \times 10^{-4}$	$k=1.8 \times 10^{-4}$	$k=1.8 \times 10^{-4}$	$k=6.7 \times 10^{-4}$	$k=1.8 \times 10^{-4}$	$k=9.7 \times 10^{-5}$	$k=1.0 \times 10^{-4}$	
10 ⁻³	$k=3.2 \times 10^{-4}$	$k=8.5 \times 10^{-4}$	$k=9.1 \times 10^{-4}$	$k=6.2 \times 10^{-4}$	$k=8.9 \times 10^{-4}$	$k=1.8 \times 10^{-4}$	$k=2.2 \times 10^{-4}$	
10 ⁻⁴	$k=1.6 \times 10^{-4}$	$k=1.0 \times 10^{-4}$	$k=1.1 \times 10^{-5}$	$k=1.4 \times 10^{-4}$	$k=7.4 \times 10^{-6}$	$k=3.2 \times 10^{-7}$	$k=6.2 \times 10^{-6}$	

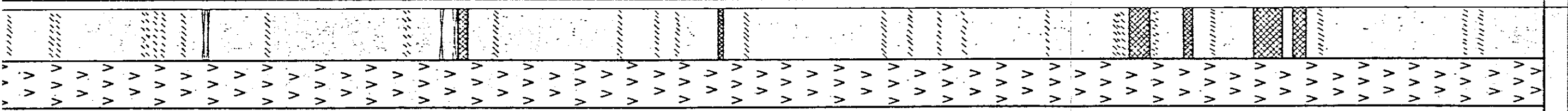
12.5
7.5
2.5

C _H	C _L	C _H	C _M	C _H	C _M	C _H	C _M	C _H	C _M	C _H
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HARD

DTCB / DIAMOND BITS

75
25
75
25
50
10
2



TUFF

Slightly weathered tuff, grey, weakly cemented, hard, fractured, jointed, broken core, inclined joint, shown on depth :
 (20.05 ; 22.20 ; 22.80 ; 23.80 ; 24.00 ; 26.00 ; 26.15 ; 26.30 ; 26.50 ; 27.00 ; 29.00 ; 32.40 ; 32.50 ; 34.60 ; 37.60 ; 38.50 ; 39.00 ; 40.70 ; 44.00 ; 44.60 ; 45.30 ; 45.90 ; 47.90 ; 49.70 ; 49.80 ; 49.90 ; 50.60 ; 50.65 ; 52.00 ; 54.65 ; 58.10 ; 58.60) m.
 Cross joint shown on depth :
 (27.50 ; 27.60 ; 33.30 ; 33.60) m.
 Broken core shown on depth :
 (9.00-9.80 , 11.00-14.55, 15.40-15.70, 16.10-16.40, 16.80-17.00, 17.80-18.00, 18.10-18.20, 18.70-19.00, 33.70-33.90, 40.00-40.10, 50.00-50.50, 51.30-51.50, 53.00-53.70, 53.90-54.20) m.

23.10	24.20	25.00	26.57	28.15	29.70	30.00	31.50	33.00	34.50	35.00	35.80	37.30	38.90	40.00	41.55	44.65	45.00	46.55	48.55	50.00	51.80	51.88	53.15	54.20	55.00	57.32	60.00
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- 8.86

Ø 52mm

WATER FLUSH

DRILLING REPORT

HOLE No.: B.17

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3.

R.L. GROUND SURFACE (m.a.s.l) : +47.39 m.

R.L. BOTTOM OF HOLE (m.a.s.l) : - 2.61 m.

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m.

CO-ORDINATES : N 1901.20.
E 1914.30.

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL

SCALE : 1 : 100

Contractor : PT. WIRATMAN & Ass. Driller : SUGIRI.

Started : SEPTEMBER 4, 1982.

Finished : SEPTEMBER 17, 1982. Logged by :

Date : September 18, 1982

Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)							174																						
WATER PRESSURE TESTS (kg/cm ²)	0.5																												
	1.0																												
LUGEON UNITS	0.5																												
	10																												
ROCK CLASSIFICATION		D	CL	CM	CH	CM	CL																						
HARDNESS																													
RELATIVE DENSITY		LOOSE																											
CONSISTENCY		HARD																											
CORE BARREL	STCB	STCB																											
	DTCB		DT																										
	TTCB			TTCB			TTCB																						
DRILL WATER LOSS %	100																												
CORE LOSS %	100																												
R. Q. D %	100																												
FRACTURE LOG	20																												
WEATHERING	CW																												
STRUCTURES																													
DIAGRAM																													
LAYER TYPE		SAND	SAND & GRAVEL	RESIDUAL SOILS																									
GEOLOGICAL DESCRIPTION		Silty sand, brown, very fine to fine grain, poorly graded, loose		Gravel and sand mixture, brown, fine to coarse grain, well graded, loose. Average ϕ gravel: 0.2-3 cm. Maximum ϕ gravel: 0.8 cm. Highly weather dacitic tuff represent of clayey silt, gravelly, grey, hard. Moderately weathered dacitic tuff, brown, weakly cemented, hard, fractured, jointed, broken core, limonitic infilled. Inclined joint shown on depth: (6.70, 7.20, 10.70) m. Vertical joint shown on depth: (4.70-6.30, 7.80-9.70) m. Broken core shown on depth: (4.70-6.30, 6.80-7.20, 7.60-8.10, 8.60-8.90, 9.00-10.20) m. Limonitic vein shown on depth: (7.25, 7.70-8.00, 8.10-8.50, 8.90-9.30, 9.60-9.70) m.																									
DRILLED LENGTH (m)	0.00	0.50	1.00	2.20	3.35	3.65	4.00	4.25	4.50	5.00	5.50	6.30	7.20	8.05	8.85	10.00	11.00	11.35	12.90	13.70	15.00	16.00	17.45	19.00	20.00	20.20	21.20	22.70	
R.L (m.a.s.l)	+47.39				+44.04	+43.39	+42.69									+36.39													
WATER LEVEL AND DATE		4.9.82			8.9.82	9.9.82	7.9.82	9.11.82	10.9.82	9.9.82	11.9.82	9.9.82	9.9.82	9.9.82	9.9.82														
CEMENTED CLEANED OUT CASING DURING DRILLING																													
ϕ OF CORE		Ø 59.2mm		Ø 55mm.			Ø 89 mm																						
DRILLING METHOD		DRY DRILLING																											

174				126			
$k=7.1 \times 10^{-5}$	$k=0$	$k=4.2 \times 10^{-4}$	$k=4.2 \times 10^{-4}$	$k=5.9 \times 10^{-7}$	$k=0$	$k=2.8 \times 10^{-6}$	
$k=1.5 \times 10^{-4}$	$k=1.4 \times 10^{-4}$	$k=5.8 \times 10^{-4}$	$k=1.6 \times 10^{-3}$	$k=3.5 \times 10^{-6}$	$k=1.3 \times 10^{-6}$	$k=9.8 \times 10^{-6}$	
$k=7.1 \times 10^{-5}$	$k=0$	$k=9.6 \times 10^{-3}$	$k=1.4 \times 10^{-5}$	$k=3.5 \times 10^{-6}$	$k=2.5 \times 10^{-6}$	$k=6.3 \times 10^{-6}$	

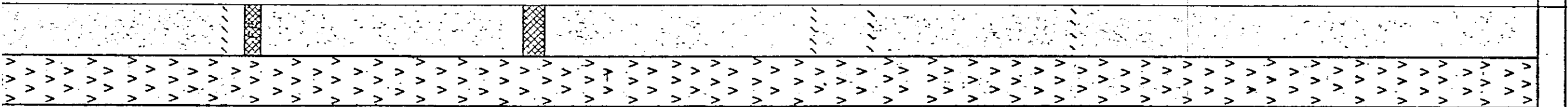
12.5
7.5
2.5

C _H	C _M	C _L	C _H	C _L	C _H	C _L	C _H
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HARD

DT	TTCB	DTCB	TTCB
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75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TUFF

Slightly weathered dacitic tuff, grey, slightly cemented, hard, fractured, jointed, broken core with limonitic infilled.
 Inclined joint shown on depths: (12.50, 18.80, 32.90, 34.20, 38.90) m.
 Broken core shown on depth: (12.80-13.40, 19.30-19.70, 26.00-26.50) m.
 Limonitic vein shown on depth: (12.90-13.30, 19.30-19.70) m.

15.00	16.00	17.45	19.00	20.00	20.20	21.20	22.70	24.20	25.65	25.75	26.70	28.00	29.45	30.10	31.20	32.50	34.00	35.00	36.50	38.00	39.50	40.00	41.50	42.90	43.60	45.00	45.75	47.20	48.75	50.00
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-2.61

Ø 89 mm

Ø 52 mm

R F L U S H

DRILLING REPORT

HOLE No : B.18

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS.3

CO-ORDINATES : N.1902.94.
E.1819.04.

R.L. GROUND SURFACE (m.d.s.l) : +74.97 m

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.d.s.l) : +34.97 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m

SCALE : 1 : 100

Contractor : PT WIRATMAN & Ass. Driller : Supardi

Drilling rig : TONE TASS-3E Started : SEPTEMBER. 22.1982

Finished : SEPTEMBER 29.1982 Logged by :

Date : Checked by :

Remarks

TESTS: Γ_c (Kg/cm ²)						
WATER PRESSURE TESTS (kg/cm ²)	0.5	k=6.9 x 10 ⁻⁵	k=3.8 x 10 ⁻⁴	k=3.7 x 10 ⁻⁵	k=1.0 x 10 ⁻⁵	
	1.0	k=1.4 x 10 ⁻⁴	k=5.3 x 10 ⁻⁴	k=1.3 x 10 ⁻⁴	k=2.6 x 10 ⁻⁵	
	0.5	k=9.8 x 10 ⁻⁵	k=4.0 x 10 ⁻⁴	k=6.2 x 10 ⁻⁵	k=6.3 x 10 ⁻⁶	
	5.0					
	0					
LUGEON UNITS						
ROCK CLASSIFICATION		D	CL	CM	CL	CM CL
HARDNESS		H A R D				
RELATIVE DENSITY						
CONSISTENCY		FIRM	STIFF TO HARD			
CORE BARREL	S.T.C.B.					
	D.T.C.B.					
	T.T.C.B.	TTCB	TTCB / STEEL BITS		TTCB	
DRILL WATER LOSS %		[Graph showing water loss percentage vs depth]				
CORE LOSS %		[Graph showing core loss percentage vs depth]				
R.Q.D %		[Graph showing R.Q.D percentage vs depth]				
FRACTURE LOG		[Graph showing fracture log vs depth]				
WEATHERING		[Graph showing weathering vs depth]				
STRUCTURES		[Structural diagrams]				
DIAGRAM		[Diagrams]				
LAYER TYPE		RESIDUAL SOILS			DACITIC TUFF	
GEOLOGICAL DESCRIPTION		Completely weathered dacitic tuff represent of silty clay, brown with spotted grey, firm, plastic, moist. Highly weathered dacitic tuff represent of clayey silt, gravelly grey and brown, stiff to hard, slightly plastic.			Moderately weathered dacitic tuff, grey and brown, weakly cemented, hard, fractured, jointed, broken core, rich with limonite infilled. Inclined joint shown on depth: (3.80, 4.20, 5.30, 5.60, 7.40, 7.60, 11.10, 12.15, 12.20, 13.90, 14.00) m. Vertical joint shown on depth: (7.90 - 8.30, 11.20 - 12.80) m. Broken core shown on depth: (3.90 - 4.00, 4.40 - 5.30, 5.70 - 6.70, 6.60 - 12.15) m.	
DRILLED LENGTH (m)		0.00	0.30	0.50	0.70	0.90
R.L (m.d.s.l)		+74.97	+74.67	+74.17	+73.47	+71.37
WATER LEVEL AND DATE			22.9.82	23.9.82	24.9.82	25.9.82
CEMENTED CLEANED OUT						
CASING DURING DRILLING		Ø 89 mm				
Ø OF CORE		Ø 52 mm				
DRILLING METHOD		DRY DRILLING				
GEOLOGICAL DESCRIPTION		Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core. Inclined joint shown on depth: (14.40, 16.30, 16.60, 17.00, 17.15, 17.50, 24.80, 27.10, 37.60, 37.80, 39.00) m.				

				271								121
	$k=6.9 \times 10^{-5}$	$k=3.8 \times 10^{-4}$	$k=3.7 \times 10^{-5}$	$k=1.0 \times 10^{-5}$	$k=4.9 \times 10^{-7}$	$k=6.5 \times 10^{-7}$	(retested $k=3.0 \times 10^{-5}$ $k=9.6 \times 10^{-6}$)					
	$k=1.4 \times 10^{-4}$	$k=5.3 \times 10^{-4}$	$k=1.3 \times 10^{-4}$	$k=2.6 \times 10^{-5}$	$k=2.5 \times 10^{-6}$	$k=6.5 \times 10^{-7}$	(retested $k=3.2 \times 10^{-5}$ $k=3.0 \times 10^{-5}$)					
	$k=9.8 \times 10^{-5}$	$k=4.0 \times 10^{-4}$	$k=6.2 \times 10^{-5}$	$k=6.3 \times 10^{-6}$	$k=4.9 \times 10^{-7}$	$k=6.5 \times 10^{-7}$	(retested $k=7.7 \times 10^{-5}$ $k=7.9 \times 10^{-5}$)					

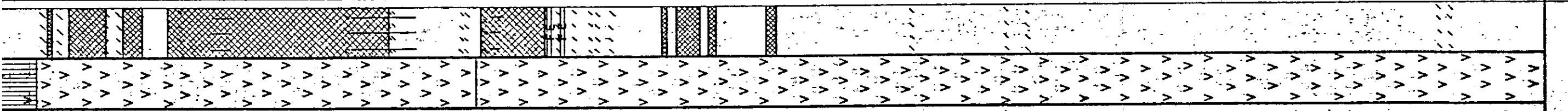
12.5
7.5
2.5

D	CL	CM	CL	CM	CL	CM	CL		CH	CM
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H A R D

TTCB / STEEL BITS						TTCB / DIAMOND BITS						STCB / STEEL BITS					
-------------------	--	--	--	--	--	---------------------	--	--	--	--	--	-------------------	--	--	--	--	--

75
25
75
25
75
25
50
10
2
D
HW
SW



DACITIC TU FF

any plastic.

Moderately weathered dacitic tuff, grey and brown, weakly cemented, hard, fractured, jointed, broken core, rich with limonitic infill.

Inclined joint shown on depth: (3.80-4.20, 5.30, 5.60, 7.0, 7.40, 11.0, 12.15, 12.20, 13.90, 14.00) m.

Vertical joint shown on depth: (7.90-8.30, 11.20-12.80) m.

Broken core shown on depth: (3.90-4.00, 4.40-5.30, 5.70-6.20, 6.80-12.15) m.

Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core.

Inclined joint shown on depth: (14.40, 16.30, 16.60, 17.00, 17.15, 17.50, 24.80, 27.10, 37.60, 37.80, 39.00) m.

Vertical joint shown on depth: (14.60-14.80) m.

Broken core shown on depth: (14.35-15.90, 16.70-16.80, 19.00-19.60, 19.80-20.00, 21.30-21.50) m.

Limonitic vein shown on depth: (15.90-16.00, 16.20-16.30) m.

37.37	4.50	5.25	5.75	6.90	7.60	8.40	9.30	10.00	10.50	11.90	12.50	16.75	17.60	18.80	20.00	21.00	21.80	22.85	24.20	25.00	26.50	28.00	29.50	30.00	31.50	33.00	34.50	35.00	36.50	38.00	39.50	40.00	
24.9.82	25.9.82	26.9.82	27.9.82	28.9.82	29.9.82	30.9.82	31.9.82	32.9.82	33.9.82	34.9.82	35.9.82	36.9.82	37.9.82	38.9.82	39.9.82	40.9.82	41.9.82	42.9.82	43.9.82	44.9.82	45.9.82	46.9.82	47.9.82	48.9.82	49.9.82	50.9.82	51.9.82	52.9.82	53.9.82	54.9.82	55.9.82	56.9.82	57.9.82

89 mm

52 mm

59.2 mm

DRY DRILLING WATER FLUSH

DRILLING REPORT

HOLE No.: B.19

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3.
 CO-ORDINATES : N.1898.18.
 E.1803.00.
 R.L. GROUND SURFACE (m a.s.l.) : +84.00 m.
 DEVIATION FROM VERTICAL : 0°
 R.L. BOTTOM OF HOLE (m a.s.l.) : +54.00 m.
 DIRECTION : VERTICAL.
 TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.
 SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : SUPARDI

Drilling rig : TONE TASS 3E Started: SEPTEMBER 15. 1982.

Finished : SEPTEMBER 20. 1982. Logged by:

Date : Checked by:

Remarks:

TESTS : σ_c (Kg/cm ²)									94																											
	WATER PRESSURE TESTS (kg/cm ²)	0.5	1.0																																	
LUGEON UNITS	10	5	0																																	
ROCK CLASSIFICATION				D	CL	CM	CH																													
HARDNESS								HARD																												
RELATIVE DENSITY																																				
CONSISTENCY	FIRM TO HARD																																			
CORE BARREL	STCB	STCB			STCB			TTCB																												
	DTCB																																			
	TTCB	TTCB STEEL BITS																																		
DRILL WATER LOSS %	100	50	0																																	
CORE LOSS %	100	50	0																																	
R.Q.D. %	100	50	0																																	
FRacture LOG	20	1																																		
WEATHERING	CW																																			
	MW																																			
STRUCTURES																																				
DIAGRAM																																				
LAYER TYPE	TOP SOIL			RESIDUAL SOILS			DACITIC TUFF																													
GEOLOGICAL DESCRIPTION	TOP SOIL: Humus, brownish grey, rich with root fragments. RESIDUAL SOILS: Highly weathered dacitic tuff represent of clayey silt gravelly, brown and grey, firm to hard, plastic, moist. DACITIC TUFF: Moderately weathered dacitic tuff, grey spotted brown, weakly cemented, hard, fractured, jointed, broken core, ilmonitic infilled. Inclined joint shown on depth: (12.50-13.90, 13.05-13.10, 13.70-13.80) m. Broken core shown on depth: (6.80-9.79, 10.90-15.00, 15.60-16.20) m. Ilmonitic infilled shown on depth: (7.20-15.80 & 16.25-18.80) m.																																			
	DRILLED LENGTH (m)	0.00	0.20	0.50	1.00	1.85	3.35	3.85	4.10	4.95	5.75	5.95	6.50	6.60	7.60	8.40	9.20	10.00	11.00	11.50	12.00	12.50	13.25	13.60	14.30	15.00	15.80	16.30	16.80	18.00	19.00	19.30	20.00	21.50		
R.L. (m a.s.l.)	+84.00	+83.80	+83.70	+83.50	+83.25	+83.00	+82.70	+82.50	+82.20	+81.95	+81.75	+81.50	+81.20	+81.00	+80.40	+80.00	+79.80	+79.60	+79.40	+79.20	+79.00	+78.80	+78.60	+78.40	+78.20	+78.00	+77.80	+77.60	+77.40	+77.20	+77.00	+66.70	+66.50	+66.30		
WATER LEVEL AND DATE						16.9.82	17.9.82		18.9.82		19.9.82	17.9.82		20.9.82	18.9.82		19.9.82	9.11.82	20.9.82																	
CEMENTED CLEANED OUT																																				
CASING DURING DRILLING ϕ OF CORE																																				
DRILLING METHOD	DRY DRILLING										WATER																									

TESTS: σ_c (Kg/cm ²)		94					
WATER PRESSURE TESTS (kg/cm ²)	0.5	-	$k=2.2 \times 10^{-5}$	-	$k=1.8 \times 10^{-5}$	$k=1.0 \times 10^{-4}$	
	1.0	-	$k=4.7 \times 10^{-5}$	$k=2.9 \times 10^{-5}$ (FALLING HEAD)	$k=6.1 \times 10^{-4}$	$k=1.4 \times 10^{-4}$	
	0.5	$k=3.8 \times 10^{-5}$	$k=3.2 \times 10^{-5}$	$k=4.0 \times 10^{-5}$	$k=1.3 \times 10^{-5}$	$k=3.8 \times 10^{-5}$	
LUGEON UNITS	10						
	5						
	0						
ROCK CLASSIFICATION		D	CL	CM	CH	CL	
HARDNESS		H A R D					
RELATIVE DENSITY							
CONSISTENCY		FIRM TO HARD					
CORE BARREL	STCB	STCB	STCB				
	DTCB						
	TTCB	TTCB	TTCB STEEL BITS	TTCB / DIAMOND BITS			
DRILL WATER LOSS %	100						
	50						
	0						
CORE LOSS %	100						
	50						
	0						
R. Q. D. %	100						
	50						
	0						
FRACTURE LOG	20						
	10						
	1						
WEATHERING	CW						
	MW						
	F						
STRUCTURES			FE	FE	FE	FE	
DIAGRAM							
LAYER TYPE	TOP SOIL	RESIDUAL SOILS	DACITIC TUFF				
GEOLOGICAL DESCRIPTION	Top soil, Humus, brownish grey, rich with root fragments.	Highly weathered dacitic tuff represent of clayey silt, gravelly brown and grey, firm to hard, plastic, moist.	Moderately weathered dacitic tuff, grey spotted brown, weakly cemented, hard, fractured, jointed; broken core, limonitic infilled. Inclined joint shown on depth: (12.50, 17.90, 18.05, 18.10, 18.70, 23.90) m. Broken core shown on depth: (6.80-9.73, 10.90-15.00, 15.60-16.20) m. Limonitic infilled shown on depth: (7.80-16.80 & 16.25-18.80) m.				
DRILLED LENGTH (m)	0.00	0.00	7.80	8.40	9.20	10.00	
R.L. (m a.s.l.)	+84.00	+83.80	+77.20				
WATER LEVEL AND DATE	16.9.82	16.9.82	19.9.82	20.9.82	19.9.82	20.9.82	
CEMENTED CLEANED OUT							
CASING DURING DRILLING							
Ø OF CORE	Ø 59.2 mm	Ø 52 mm	Ø 59.2 mm	Ø 89 mm	Ø 52 mm		
DRILLING METHOD		DRY DRILLING			WATER FLUSH		

DRILLING REPORT

HOLE No.: B.20

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : DAM AXIS 3.

CO-ORDINATES : N.1904.50.
E.1783.50.

R.L.GROUND SURFACE (m.a.s.l) : +95.02 m.

DEVIATION FROM VERTICAL : 0°

R.L.BOTTOM OF HOLE (m.a.s.l) : +65.02 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m

SCALE : 1 : 100

Contractor : PT.WIRATMAN & Ass. Driller : SUPARDI.

Drilling rig : TONE TASS 3E. Started: SEPTEMBER 5.1982.

Finished : SEPTEMBER 11.1982. Logged by :

Date : Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)									
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k=4.0 \times 10^{-5}$	$k=1.5 \times 10^{-5}$	$k=2.0 \times 10^{-5}$	$k=7.6$			
	1.0		$k=6.0 \times 10^{-5}$	$k=1.5 \times 10^{-5}$	$k=3.0 \times 10^{-5}$	$k=6.5$			
	0.5		$k=2.0 \times 10^{-6}$	$k=9.9 \times 10^{-6}$	$k=9.9 \times 10^{-6}$	$k=5.4$			
	10 5 0	LUGEON UNITS							
ROCK CLASSIFICATION		D	CL	D	CL	CM	CL	CM	
HARDNESS		HARD		HARD		HARD			
RELATIVE DENSITY									
CONSISTENCY		FIRM TO HARD		STIFF TO HARD		HARD			
CORE BARREL	STCB	STEEL BITS	DIAMOND	STEEL	DIAMOND BITS	STEEL BITS	DIAMOND BITS		
	DTCB								
	TTCB								
DRILL WATER LOSS %		0							
CORE LOSS %		0							
R. Q. D. %		0							
FRACTURE LOG		0							
WEATHERING		F							
STRUCTURES		[Diagrams showing fracture patterns]							
DIAGRAM		[Diagrams showing lithological layers]							
LAYER TYPE		RESIDUAL SOILS	DACITIC TUFF	RESIDUAL SOILS	DACITIC TUFF	RESIDUAL SOILS	DACITIC TUFF		
GEOLOGICAL DESCRIPTION		Highly weathered dacitic tuff, represent of clayey silt, gravelly, grey, firm to hard, plastic, friable.		Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed on 2.80 m depth, broken core.		Highly weathered dacitic tuff represent of clayey silt, grey, light brown, stiff to hard, slightly plastic.		Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed, broken core, ilmonitite infilled.	
DRILLED LENGTH (m)		0.00	2.10	3.20	3.30	3.90	2.20	5.00	
R.L. (m.a.s.l)		+95.02	+93.52	+91.82	+91.52	+90.72	+88.02	+86.22	
WATER LEVEL AND DATE			7.9.82	8.9.82	9.9.82	10.9.82	11.9.82	10.9.82	
CEMENTED CLEANED OUT									
CASING DURING DRILLING		Ø 59.2 mm.							
Ø OF CORE		Ø 59.2 mm.							
DRILLING METHOD		WATER FLUSH							

Remarks :

TESTS: σ_c (Kg/cm ²)		99																																				
WATER PRESSURE TESTS (kg/cm ²)	0.5		$k = 4.0 \times 10^{-5}$	$k = 1.5 \times 10^{-5}$	$k = 2.0 \times 10^{-5}$	$k = 7.6 \times 10^{-6}$	$k = 1.9 \times 10^{-4}$																															
	1.0		$k = 6.0 \times 10^{-5}$	$k = 1.5 \times 10^{-5}$	$k = 3.0 \times 10^{-5}$	$k = 6.5 \times 10^{-6}$	$k = 2.1 \times 10^{-5}$																															
	0.5		$k = 2.0 \times 10^{-5}$	$k = 9.9 \times 10^{-6}$	$k = 9.9 \times 10^{-6}$	$k = 5.4 \times 10^{-6}$	$k = 1.4 \times 10^{-4}$																															
LUGEON UNITS		10																																				
ROCK CLASSIFICATION			D	CL	D	CL	CM	CL	CM	CL	D																											
HARDNESS			HARD	HARD					HARD																													
RELATIVE DENSITY																																						
CONSISTENCY			FIRM TO HARD	STIFF TO HARD	HARD																																	
CORE BARREL	STCB	STEEL BITS	DIAMOND	STEEL	DIAMOND BITS	STEEL BITS	DIAMOND BITS																															
	DTCB																																					
	TTCB																																					
DRILL WATER LOSS %		100																																				
CORE LOSS %		100																																				
R. Q. D. %		100																																				
FRACTURE LOG		20																																				
WEATHERING		CW																																				
STRUCTURES																																						
DIAGRAM																																						
LAYER TYPE			RESIDUAL SOILS	DACITIC TUFF	RESIDUAL SOILS	DACITIC TUFF	RESIDUAL SOILS	DACITIC TUFF																														
GEOLOGICAL DESCRIPTION			Highly weathered dacitic tuff, represent of clayey silt, gravelly, grey, firm to hard, plastic, friable. Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed on 2.80 m depth, broken core. Highly weathered dacitic tuff represent of clayey silt, grey, light brown, silt to hard, slightly plastic. Moderately weathered dacitic tuff, grey, brown, weakly cemented, hard, fractured, jointed, broken core, ilmonitic infilled. Inclined joint shown on depth: (5.40, 5.50, 5.80) m. Vertical joint shown on depth: (4.80-5.00) m. Broken core shown on depth: (4.30-4.70, 5.20-5.50, 6.00-6.20, 6.35-6.55) m. Highly weathered dacitic tuff represent of clayey silt, brown, hard, friable. Moderately weathered dacitic tuff, brownish grey to grey, weakly cemented, fractured, jointed, broken core, ilmonitic infilled, brecciated unclear on 26.00-30.00 m depth. Inclined joint shown on depth: (6.80, 9.00, 12.70, 12.55, 13.00, 14.85, 15.25, 17.90, 18.15, 18.20, 18.60, 18.85, 19.15, 19.30, 19.40, 20.50, 20.20, 20.30, 21.50, 22.80) m. Vertical joint shown on depth: (10.70-10.80, 16.00-16.40, 21.25-22.00) m. Broken core shown on depth: (9.90-11.15, 11.50-11.85, 13.35-14.50, 14.90-15.00, 15.40-17.30, 18.25-18.45, 21.00-21.45, 24.00-24.35, 24.70-28.00) m. Limonitic vein shown on depth: (10.00-11.30, 15.35-15.60, 19.30-19.40, 21.00-21.25, 25.00-30.00) m.																																			
DRILLED LENGTH (m)		0.00	0.20	0.70	1.05	1.50	2.10	3.20	3.90	4.20	5.00	5.20	6.50	7.00	8.00	8.30	8.40	8.80	10.00	10.90	12.40	13.60	15.00	16.40	17.10	18.60	20.00	21.25	22.80	24.20	25.00	26.40	27.60	29.00	30.00			
R.L. (m. a. s. l.)		+95.02	+93.52	+91.82	+90.72	+88.02	+86.22	+85.02	+83.82	+82.62	+81.42	+80.22	+79.02	+77.82	+76.62	+75.42	+74.22	+73.02	+71.82	+70.62	+69.42	+68.22	+67.02	+65.82	+64.62	+63.42	+62.22	+61.02	+59.82	+58.62	+57.42	+56.22	+55.02	+53.82	+52.62	+51.42	+50.22	
WATER LEVEL AND DATE				7.9.82	8.2.82	9.9.82	10.9.82	11.9.82	10.9.82	8.9.82																												
CEMENTED CLEANED OUT																																						
CASING DURING DRILLING																																						
Ø OF CORE																																						
DRILLING METHOD		DRY																																				

DRILLING REPORT

HOLE No.: B.21

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : POWER STATION

CO-ORDINATES : N 2001.79
E 2004.52

R.L. GROUND SURFACE (m.a.s.l) : +86.68 m.

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.a.s.l) : +56.68 m.

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.

SCALE : 1 : 100

Contractor : PT. WIRATMAN & Ass. Driller : SUGINO

Started : SEPTEMBER 17. 1982.

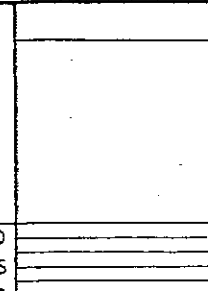
Finished : SEPTEMBER 20. 1982. Logged by:

Checked by:

Date :

Remarks :

TESTS : f_c (Kg/cm ²)		WATER PRESSURE TESTS	
LENGTH OF SECTIONS TESTED: 3m.		LUGEON UNITS	
ROCK CLASSIFICATION		HARDNESS	
RELATIVE DENSITY		CONSISTENCY	
CORE BARREL		CORE LOSS %	
DRILL WATER LOSS %		R. Q. D. %	
FRACTURE LOG		WEATHERING	
STRUCTURES		DIAGRAM	
GEOLOGICAL DESCRIPTION		LAYER TYPE	
DRILLED LENGTH (m)		R.L. (m. a. s. l)	
WATER LEVEL AND DATE		CEMENTED CLEANED OUT	
CASING DURING DRILLING		CASING DURING DRILLING	
Ø OF CORE		Ø OF CORE	
DRILLING METHOD		DRILLING METHOD	
0.00	+86.68		
0.25	+86.28		
0.40			
0.80			
2.00	+84.43		
2.25			
3.55			
4.50			
5.75	+80.60		
6.00			
7.60			
8.05			
9.75			
11.30			
12.60			
13.80			
15.20			
16.50			
17.35			
18.60			
19.78			
21.00			
22.40			



TESTS : f_c (Kg/cm²)

WATER PRESSURE TESTS

LENGTH OF SECTIONS TESTED: 3m.

LUGEON UNITS

ROCK CLASSIFICATION

RELATIVE DENSITY

CONSISTENCY

CORE BARREL

DRILL WATER LOSS %

ROCK CLASSIFICATION: D

HARDNESS: H A R D

CONSISTENCY: SOFT FIRM TO STIFF HARD

CORE BARREL: STCB, DTCB, TTCB

DRILL WATER LOSS %: 100

CORE LOSS %: 100

R. Q. D. %: 100

FRACTURE LOG: 20, 4, 1

WEATHERING: CW, MW, F

STRUCTURES: [Diagram showing various geological structures]

DIAGRAM: [Diagram showing various geological structures]

LAYER TYPE: TOP SOIL, RESIDUAL SOILS, DACITIC TUFF

GEOLOGICAL DESCRIPTION: Top soil, Silty clay, dark brown, soft, plastic, containing some root fragments. Completely weathered dacitic tuff, represents of silty clay, brown, firm to stiff, plastic. Highly weathered dacitic tuff represent of clayey silt, brown, rather cemented, hard, slightly plastic to non. Moderately weathered dacitic tuff, brownish grey spotted brown, weakly cemented, hard, fractured, jointed, broken core with iron oxides (limonite infilled). Inclined joint shown on depth: (11.70, 12.60, 14.20, 14.30, 14.40, 14.70, 14.90) m. Broken core shown on depth: (6.00-6.90, 9.50-9.80, 10.35-13.25, 13.45-17.70, 18.00-18.80, 19.35-19.70, 20.00-20.80, 22.00-22.60, 24.30-24.70) m.

DRILLED LENGTH (m): 0.00, 0.25, 0.40, 0.80, 2.00, 2.25, 3.55, 4.50, 5.75, 6.00, 7.60, 8.05, 9.75, 11.30, 12.60, 13.80, 15.20, 16.50, 17.35, 18.60, 19.78, 21.00, 22.40

R.L. (m. a. s. l): +86.68, +86.28, +84.43, +80.60

WATER LEVEL AND DATE: 18.9.82, 20.9.82

CASING DURING DRILLING: Ø 89 mm, Ø 52 mm

DRILLING METHOD: DRY DRILLING, WATER FLUSH

Remarks:

TESTS: σ_c (Kg/cm ²)		80	
WATER PRESSURE TESTS	LENGTH OF SECTIONS TESTED: 3m	L/min/m.	
	LUGEON UNITS	10	7.5
ROCK CLASSIFICATION	D	CL	CH near CL
			CM near CL
HARDNESS		H A R D	
RELATIVE DENSITY			
CONSISTENCY	SOFT FIRM TO STIFF HARD		
CORE BARREL	STCB	STCB	
	DTCB		
	TTCB	DTCB	DTCB / STEEL BITS
DRILL WATER LOSS %			TTCB / DIAMOND BITS
CORE LOSS %			
R. Q. D. %			
FRACTURE LOG			
WEATHERING	CW		
	MW		
	F		
STRUCTURES			
DIAGRAM			
LAYER TYPE	TOP SOIL	RESIDUAL SOILS	DACITIC TUFF
GEOLOGICAL DESCRIPTION	<p>Top soil, Silty clay, dark brown, soft, plastic, containing some root fragments. Completely weathered dacitic tuff, represents of silty clay, brown, firm to stiff, plastic.</p>		<p>Moderately weathered dacitic tuff, brownish grey spotted brown, weakly cemented, hard, fractured, jointed, broken core with iron oxide (limonite infilled). Inclined joint shown on depth: (11.70, 12.60, 14.20, 14.30, 14.40, 14.70, 14.90) m. Broken core shown on depth: (6.00-6.90, 9.50-9.80, 10.95-13.25, 13.45-17.70, 18.00-18.80, 19.35-19.70, 20.00-20.80, 22.00-22.60, 24.30-24.70) m.</p>
	<p>Highly weathered dacitic tuff represent of clayey silt, brown, rather cemented, hard, slightly plastic to non.</p>		<p>Slightly weathered dacitic tuff, grey, hard, slightly joint showing on depth 29.30 m with containing small amount of pumice.</p>
DRILLED LENGTH (m)	0.00	0.35	0.40
R.L (m. a.s.l)	+86.68	+86.28	+84.43
WATER LEVEL AND DATE		18.9.82	19.9.82
CEMENTED CLEANED OUT			
CASING DURING DRILLING			
Ø OF CORE	Ø 59.2mm	Ø 89mm.	Ø 52mm.
DRILLING METHOD	DRY DRILLING		WATER FLUSH

DRILLING REPORT

HOLE No.: B.22

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : POWER STATION.

CO-ORDINATES : N 1989.29
E 1863.26

R.L.GROUND SURFACE (m.a.s.l) : +62.20 m.

DEVIATION FROM VERTICAL : 0°

R.L.BOTTOM OF HOLE (m.a.s.l) : +32.20 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 30.00 m.

SCALE : 1:100.

Contractor : PT.WRATMAN & Ass. Driller : SUJIMAN.

Drilling rig : TONE TASS 3E. Started : SEPTEMBER 21. 1982.

Finished : SEPTEMBER 25. 1982. Logged by :

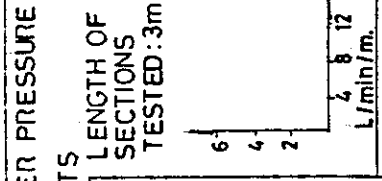
Date : SEPTEMBER 26. 1982 Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)		WATER PRESSURE		LENGTH OF SECTIONS TESTED: 3m.		L/min/m.	
LUGEON UNITS		0		2		4	
ROCK CLASSIFICATION		D		CL		CH	
HARDNESS				H A R D			
RELATIVE DENSITY							
CONSISTENCY		SOFT		FIRM		STIFF TO HARD	
CORE BARREL	S.T.C.B	S.T.C.B					
	D.T.C.B						
	T.T.C.B			T.T.C.B / STEEL BITS		T.T.C.B / DIAMOND BITS	
DRILL WATER LOSS %		100		50		0	
CORE LOSS %		100		50		0	
R.Q.D. %		100		50		0	
FRACTURE LOG		20		4		1	
WEATHERING		CW		MW		F	
STRUCTURES							
DIAGRAM							
LAYER TYPE		RESIDUAL SOIL		DACITIC TUFF			
GEOLOGICAL DESCRIPTION		TOP SOIL, Silty clay, dark brown, soft plastic, with some root fragments.		Completely weathered dacitic tuff represents of silty clay, light brown to brown, firm, plastic.		Highly weathered dacitic tuff represents of clayey silt brown, grey rather cemented, stiff to hard, slightly plastic to hard.	
DRILLED LENGTH (m)		0.00		0.50		1.00	
R.L (m.a.s.l)		+62.20		+61.80		+59.00	
WATER LEVEL AND DATE		23.9.82		24.9.82		25.9.82	
CEMENTED CLEANED OUT		23.9.82		24.9.82		25.9.82	
CASING DURING DRILLING		Ø 59.2mm		Ø 52mm		Ø 89mm	
DRILLING METHOD		DRY DRILLING		WATER FLUSH			

Remarks:

TESTS: σ_c (Kg/cm²)



WATER PRESSURE TESTS

LUGEON UNITS

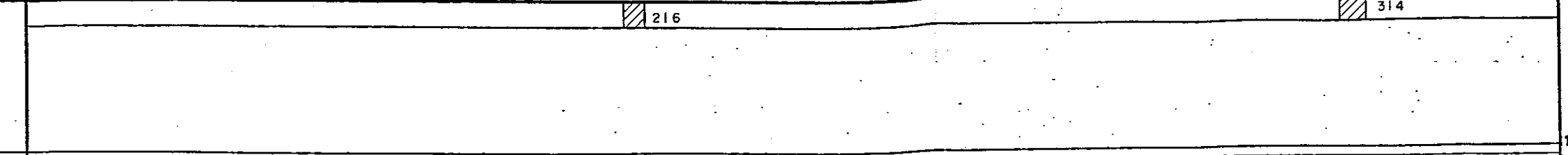
ROCK CLASSIFICATION

HARDNESS

RELATIVE DENSITY

CONSISTENCY

CORE BARREL



10
5
0

D CL CH CM CH C_M near CH

H A R D

SOFT FIRM STIFF TO HARD

S.T.C.B S.T.C.B

T.T.C.B / STEEL BITS T.T.C.B / DIAMOND BITS

100
50
0

75
25

100
50
0

75
25

100
50
0

75
25

20
10
4
1

50
10
2

CW
MW
F

D
HW
SW

STRUCTURES

DIAGRAM

LAYER TYPE

GEOLOGICAL DESCRIPTION

DRILLED LENGTH (m)

R.L (m.a.s.l)

WATER LEVEL AND DATE

CEMENTED CLEANED OUT

CASING DURING DRILLING

Ø OF CORE

DRILLING METHOD

RESIDUAL SOIL DACITIC TUFF

TOP SOIL, Silty clay, dark brown, soft plastic, with some root fragments.
Completely weathered dacitic tuff represents of silty clay, light brown to brown, firm, plastic.
Highly weathered dacitic tuff represents of clayey silt brown, grey rather cemented, stiff to hard, slightly plastic to hard.
Moderately weathered dacitic tuff grey and brown, weakly cemented, hard, fractured, broken core, and mostly limonitic infilled (iron oxide).
Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed with abundant small amount of pumice, inclined joint shown on depth: (13.60, 15.80, 15.90, 29.70;) m

0.00 0.50 1.00 1.50 2.00 2.35 2.75 3.00 3.70 4.00 4.30 4.80 5.00 5.40 5.75 6.00 6.40 6.85 7.45 8.00 8.80 9.75 10.50 11.20 12.75 14.30 15.75 17.25 18.75 20.25 21.75 23.25 24.80 26.20 27.70 29.20 30.00

-62.20 -61.80 -59.00 -55.85 -50.85

22.9.82 23.9.82 26.9.82 25.9.82 9.11.82 23.9.82 24.9.82

Ø 59.2mm Ø 89mm Ø 52mm

DRY DRILLING WATER FLUSH

DRILLING REPORT

HOLE No: B.24

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR-II)

CO-ORDINATES : N 703.108,08
E 31.544,98

R.L GROUND SURFACE (m.a.s.l) : +85.75 m

DEVIATION FROM VERTICAL: 0°

R.L BOTTOM OF HOLE (m.a.s.l) : +60.75 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 25.00 m

SCALE : 1 : 100

Contractor : PT WIRATMAN & Ass Driller : OHEN.

Drilling rig : YBM YSO 1. Started : SEPTEMBER 26.1982.

Finished : SEPTEMBER 30.1982. Logged by :

Checked by :

Date : OCTOBER 1.1982.

Remark :

TESTS	WATER PRESSURE	LENGTH OF SECTIONS TESTED : 3m	L/min/m
	LUGEON UNITS		
ROCK CLASSIFICATION	D		
HARDNESS	HARD HARD HARD HARD		
RELATIVE DENSITY			
CONSISTENCY	SOFT FIRM TO STIFF HARD STIFF TO HARD STIFF TO HARD STIFF TO HARD		
CORE BARREL	S.T.C.B	S.T.C.B	
	D.T.C.B	SICB	
	T.T.C.B	T.T.C.B	T.T.C.B / STE
DRILL WATER LOSS %	100 50 0		
CORE LOSS %	100 50 0		
R Q D %	100 50 0		
FRACTURE LOG	20 4 1		
WEATHERING	CW MW F		
STRUCTURES			
DIAGRAM			
LAYER TYPE	TOP SOIL		

DRILLED LENGTH (m)	R L (masl)	WATER LEVEL AND DATE	CEMENTED CLEANED OUT	CASING DURING DRILLING	Ø OF CORE	DRILLING METHOD	GEOLOGICAL DESCRIPTION
0.00	+85.75						
0.25	+85.50						Top Soil, silty clay with some root fragments, dark brown, soft, plastic, moist.
1.00							Completely weathered phyllitic rock represents of silty clay, light grey, light brown, firm to stiff, plastic, moist.
1.40							Highly weathered phyllitic rock represents of clayey silt, gravelly, sandy, reddish brown, stiff to hard, slightly plastic.
1.70							
2.00							
2.20							
2.60	+83.75						
2.85							
3.10							
3.40							
3.70		26.9.82					
4.00							
4.25							
5.00							Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.
5.40		27.9.82					
5.80							
6.10	+79.45						
6.30	+79.35						
6.75							
7.20							
7.65		29.9.82					
8.15		27.9.82					
8.60		29.9.82					
8.80		30.9.82					
9.20	+76.55						
9.50	+76.15						
9.85							
10.50							
11.00							
11.40	+74.25						
11.85							
12.45							
12.85							
13.25							
13.90							
14.40							
14.65							
15.00							
15.35							
16.25		30.9.82					
16.60	+68.75						
17.00							
18.00							
19.20							
20.00							
20.30							
21.40							Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.

DRY DRILLING

Ø 52 mm WATER FLUSH
Ø 59.2 mm DRY
Ø 52 mm WATER FLUSH
Ø 59.2 mm DRY
Ø 52 mm WATER

R.L BOTTOM OF HOLE (m.a.s.l) : +60.75 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 25.00 m

SCALE : 1 : 100

Contractor : PT WIRATMAN & Ass Driller : OHEN Started : SEPTEMBER 26.1982.

Finished : SEPTEMBER 30.1982. Logged by :

Date : OCTOBER 1.1982. Checked by :

Remark :

TESTS		WATER PRESSURE TESTS	LENGTH OF SECTIONS TESTED : 3m	L/min/m
LUGEON UNITS				
ROCK CLASSIFICATION		D		
HARDNESS		HARD HARD HARD HARD		
RELATIVE DENSITY				
CONSISTENCY		SOFT FIRM TO STIFF HARD STIFF TO HARD STIFF TO HARD STIFF TO HARD		
CORE BARREL	S.T.C.B	S.T.C.B		
	D.T.C.B			
	T.T.C.B	T.T.C.B		
DRILL WATER LOSS %		75		
CORE LOSS %		75		
R Q D %		75		
FRACTURE LOG		20 10 4 1		
WEATHERING		D HW SW		
STRUCTURES				
DIAGRAM				
LAYER TYPE		TOP SOIL		
GEOLOGICAL DESCRIPTION		<p>Top Soil, silty clay with some root fragments, dark brown; soft, plastic, moist.</p> <p>Completely weathered phyllitic rock represents of silty clay, light grey, light brown, firm to stiff, plastic, moist.</p> <p>Highly weathered phyllitic rock represents of clayey silt, gravelly, sandy, reddish brown, stiff to hard, slightly plastic.</p> <p>Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.</p> <p>Highly weathered phyllitic rock represents of clayey silt, gravelly, sandy, reddish brown, stiff to hard, slightly plastic.</p> <p>Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.</p> <p>Highly weathered phyllitic rock represents of clayey silt, gravelly, sandy, reddish brown, stiff to hard, slightly plastic.</p> <p>Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.</p> <p>Highly weathered phyllitic rock represents of clayey silt, gravelly, sandy, reddish brown, stiff to hard, slightly plastic.</p> <p>Moderately weathered phyllitic rock, reddish grey, weakly cemented, hard, limonitic infilled, broken core.</p>		
DRILLED LENGTH (m)		0.00 0.25 0.50 1.00 1.40 1.70 2.00 2.20 2.60 2.85 3.10 3.40 3.70 4.00 4.25 5.00 5.40 5.80 6.10 6.30 6.50 6.75 7.20 7.65 8.15 8.60 8.80 9.20 9.50 9.85 10.50 11.00 11.40 11.85 12.45 12.85 13.25 13.90 14.40 14.65 15.00 15.35 16.25 16.60 16.90 17.00 18.00 19.20 20.00 20.30 21.40 23.00 24.20 25.00		
R L (m a s l)		+85.75 +85.50 +83.75 +81.00 +79.45 +79.35 +77.15 +76.55 +76.15 +74.25 +68.75 +60.75		
WATER LEVEL AND DATE		26.9/82 27.9/82 29.9/82 27.9/82 29.9/82 30.9/82 30.9/82		
CEMENTED CLEANED OUT				
CASING DURING DRILLING				
Ø OF CORE		Ø 59.2 mm. Ø 52 mm. Ø 59.2 mm. Ø 52 mm. Ø 52 mm.		
DRILLING METHOD		DRY DRILLING WATER FLUSH DRY WATER FLUSH DRY WATER FLUSH		

DRILLING REPORT

HOLE No.: B.25

PROJECT : KOTAPANJANG H.E.P.P

LOCALITY : QUARRY SITE (QR-II)

CO-ORDINATES : N 703.248,90.
E 31.448,78.

R.L. GROUND SURFACE (m.a.s.l) : +85.24 m.

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.a.s.l) : +54.74 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 30.50 m.

SCALE : 1:100

Contractor : PT. WIRATMAN & Ass. Driller : OHEN.

Drilling rig : YBM-YSO 1

Started : SEPTEMBER 20. 1982.

Finished : SEPTEMBER 24. 1982. Logged by:

Checked by:

Date :

Remarks :

TESTS		WATER PRESSURE	LENGTH OF SECTIONS TESTED: 3m.	L/min/m.
LUGEON UNITS		10	4	8
ROCK CLASSIFICATION		D		
HARDNESS				
RELATIVE DENSITY				
CONSISTENCY		SOFT	FIRM TO STIFF	STIFF TO HARD
CORE BARREL	STCB	ST	ST	ST
	DTCB			
	TTCB	TT	TT	TT
DRILL WATER LOSS %	100	50	0	
CORE LOSS %	100	50	0	
R. Q. D. %	100	50	0	
FRACTURE LOG	20	4	1	
WEATHERING	CW	[REDACTED]		
STRUCTURES	MW			
DIAGRAM	F			
LAYER TYPE	TOP SOIL	RESIDUAL SOILS		
GEOLOGICAL DESCRIPTION	Top Soil, Silty Clay with some roots, dark brown, soft, plastic, moist.			
	Completely weathered phyllitic rock represent of silty clay, brown, firm to stiff, plastic, moist.			
DRILLED LENGTH (m)	Highly weathered phyllitic rock represent of clayey silt, gravely, sandy, brown, reddish brown and light grey, stiff to hard, slightly plastic.			
	0.00	0.50	1.00	1.50
R.L (m. a.s.l)	+85.24	+85.04	+81.54	
WATER LEVEL AND DATE	20.9/82	21.9/82	23.9/82	22.9/82
CEMENTED CLEANED OUT CASING DURING DRILLING	Ø 89 mm.			
Ø OF CORE	Ø 59.2 mm	Ø 52mm	Ø 59.2 mm	Ø 52mm Ø 59.2mm Ø 52mm
DRILLING METHOD	DRY DRILLING	WATER FLUSH	DRY DRILLING	WATER FLUSH DRY WATER FLUSH DRY DRILLING

TESTS			
WATER PRESSURE	LENGTH OF SECTIONS TESTED: 3m.	L/min/m.	
TESTS	LUGEON UNITS	10	7.5
		5	2.5
		0	
ROCK CLASSIFICATION		D	
HARDNESS			
RELATIVE DENSITY			
CONSISTENCY		SOFT FIRM TO STIFF STIFF TO HARD	
CORE BARREL	STCB	ST	ST
	DTCB		ST
	TTCB	TT	TT
			TT
			TT
			TT
			TT
			TTCB / STEEL BITS
DRILL WATER LOSS %			
CORE LOSS %			
R.Q.D. %			
FRACTURE LOG			
WEATHERING	CW		
	MW		
	F		
STRUCTURES			
DIAGRAM			
LAYER TYPE	TOP SOIL	RESIDUAL SOILS	
GEOLOGICAL DESCRIPTION	Top Soil, Silty Clay with some roots, dark brown, soft, plastic, moist. Completely weathered phyllitic rock represent of silty clay, brown, firm to stiff, plastic; moist. Highly weathered phyllitic rock represent of clayey silt, gravelly, sandy, brown, reddish brown and light grey, stiff to hard, slightly plastic. Moderately weathered phyllitic rock, grey, brown, weakly cemented, fractured, jointed, ironitic infilled, mostly broken core.		
DRILLED LENGTH (m)	0.00 0.50 1.00 1.50 2.50 3.00 3.25 3.40 3.70 5.00 5.80 6.15 6.45 6.70 7.00 7.70 8.25 8.70 9.25 9.60 10.00 10.50 10.70 11.25 11.60 11.90 12.15 12.75 13.00 14.10 14.50 15.00 15.50 17.00 17.30 18.00 18.45 18.70 18.90 19.70 20.00 20.30 20.60 21.00 21.35 23.00 26.45 26.80 27.45 27.80 28.50 30.50		
R.L (m. a.s.l)	+85.24 +85.04 +81.54	+21.9/82	+54.74
WATER LEVEL AND DATE			
CEMENTED CLEANED OUT CASING DURING DRILLING			
Ø OF CORE	Ø 59.2 mm	Ø 52mm	Ø 59.2mm
DRILLING METHOD	DRY DRILLING	WATER FLUSH	DRY DRILLING

12.5
7.5
2.5
75
25
75
25
75
25
50
10
2
D
HW
SW
D
HW
SW

Remarks:

DRILLING REPORT

HOLE No.: B.26

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR - III)

CO-ORDINATES : N 708.191,07
E 30.681,26

R.L. GROUND SURFACE (m. a. s. l.) : +159.61 m.

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m. a. s. l.) : +119.61 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller : DJEMINGAN.

Started : OCTOBER 21, 1982.

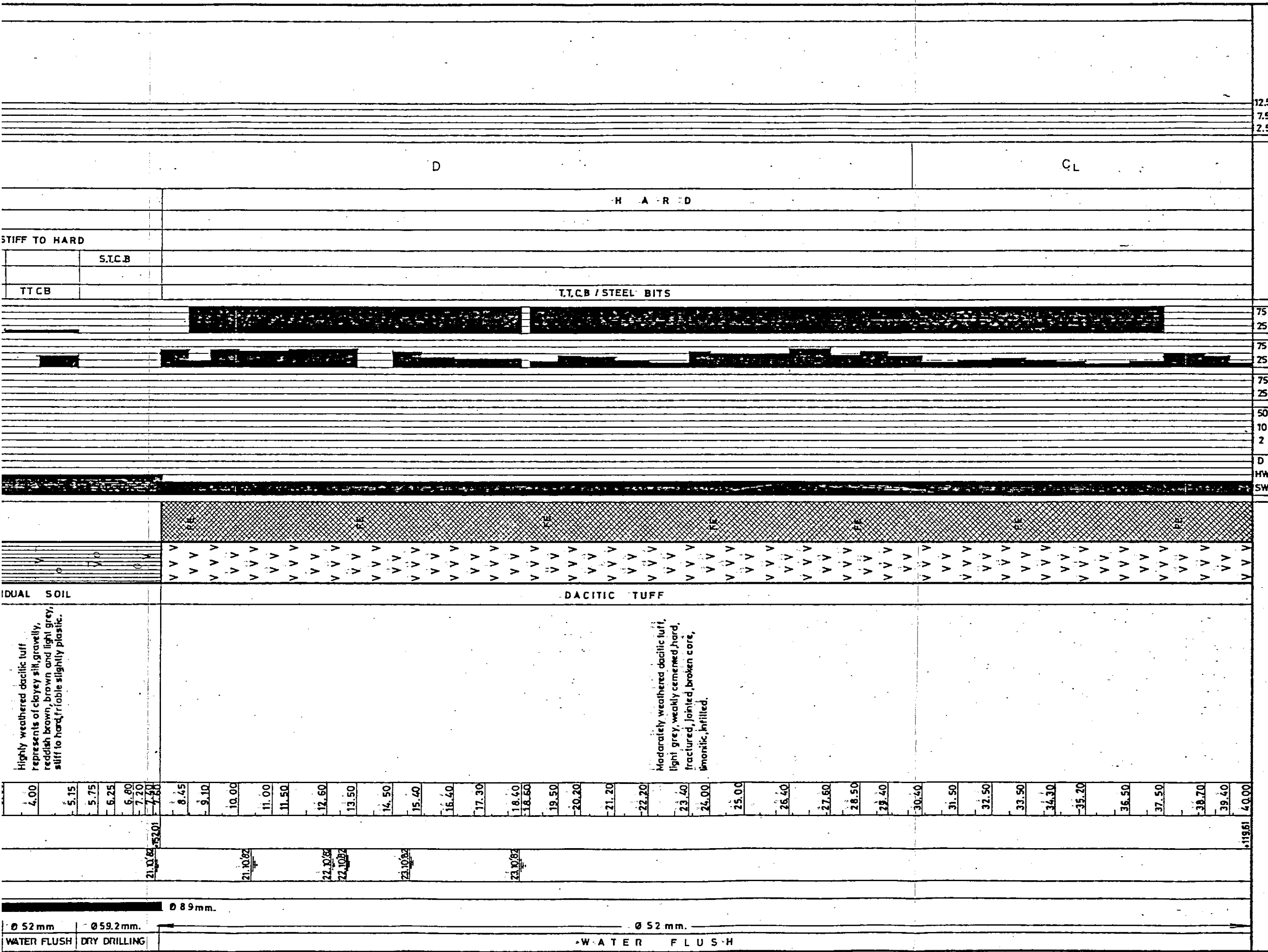
Finished : OCTOBER 23, 1982. Logged by :

Checked by :

Date : OCTOBER 24, 1982

Remarks :

TESTS		WATER PRESSURE TESTS		LENGTH OF SECTIONS TESTED: 3m.		
LUGEON UNITS		L/min/m.		6 4 2		
ROCK CLASSIFICATION		D				
HARDNESS		H A R D				
RELATIVE DENSITY						
CONSISTENCY		SOFT TO FIRM		STIFF TO HARD		
CORE BARREL	S.T.C.B	S.T.C.B		S.T.C.B		
	D.T.C.B					
	T.T.C.B	T.T.C.B		T.T.C.B / STEEL BITS		
DRILL WATER LOSS %	100		50		0	
CORE LOSS %	100		50		0	
R Q D %	100		50		0	
FRACTURE LOG	20		4		1	
WEATHERING	CW		MW		F	
STRUCTURES			FE		FE	
DIAGRAM						
LAYER TYPE	RESIDUAL SOIL		DACITIC TUFF			
GEOLOGICAL DESCRIPTION	Completely weathered dacitic tuff represents of silty clay, brown, soft to firm, plastic the upper part up to 0.60 m containing roots fragments.		Highly weathered dacitic tuff represents of clayey silt, gravelly, reddish brown, brown and light grey, stiff to hard, friable slightly plastic.		Moderately weathered dacitic tuff, light grey, weakly cemented, hard, fractured, jointed, broken core, arenaceous, infilled.	
DRILLED LENGTH (m)	0.00	0.50	0.90	1.00	1.50	1.85
R.L (m. a. s. l)	+159.61	+158.61	+157.61	+156.61	+155.61	+154.61
WATER LEVEL AND DATE			21.10.82	21.10.82	22.10.82	22.10.82
CEMENTED CLEANED OUT CASING DURING DRILLING			Ø 89 mm.			
Ø OF CORE	Ø 72 mm	Ø 59.2 mm	Ø 52 mm	Ø 59.2 mm.	Ø 52 mm.	
DRILLING METHOD.	DRY DRILLING	WATER FLUSH	DRY DRILLING	WATER FLU		



12.5
7.5
2.5
75
25
75
25
75
25
50
10
2
D
HW
SW

DRILLING REPORT

HOLE No : B.27

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR - III)

CO-ORDINATES : N 708.300,58
E 30.679,19

R.L. GROUND SURFACE (m.d.s.l) : +202.40 m

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.d.s.l) : +162.40 m

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 40.00 m

SCALE : 1 : 100

Contractor : PTWIRATMAN & Ass. Driller : DJEMINGAN.

Drilling rig : TONE TDC. Started : OCTOBER 16, 1982.

Finished : OCTOBER 19, 1982. Logged by :

Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)	
WATER PRESSURE	
LENGTH OF SECTIONS TESTED: 3 m	
TESTS	LUGEON UNITS
ROCK CLASSIFICATION	D
HARDNESS	
RELATIVE DENSITY	
CONSISTENCY	FIRM TO HARD
CORE BARREL	S.T.C.B D.T.C.B T.T.C.B
DRILL WATER LOSS %	
CORE LOSS %	
R Q D %	
FRACTURE LOG	
WEATHERING	CW MW F
STRUCTURES	
DIAGRAM	
LAYER TYPE	RESIDUAL SOIL
GEOLOGICAL DESCRIPTION	Highly weathered dacitic tuff represents of clayey silt, gravelly, light grey and brown, firm to hard, friable; rather cemented.
DRILLED LENGTH (m)	0.70 1.30 1.35 1.50 1.68 1.85 2.00 2.30 2.50 2.80 3.00 3.50 4.00 4.75 5.50 6.00 6.80 7.60 8.30 10.00 11.20 12.30 13.20 14.30 15.75 17.30 18.50 19.00 19.65 21.10 22.50
R.L (m.d.s.l)	+202.40 201.70 200.35 188.85 187.18 185.50 183.20 180.90 178.60 175.80 172.30 168.80 164.10 159.35 154.60 149.85 145.10 140.35 135.60 130.85 126.10 121.35 116.60 111.85 107.10 102.35 97.60 92.85 88.10 83.35 78.60 73.85 69.10 64.35 59.60 54.85 50.10 45.35 40.60 35.85 31.10 26.35 21.60 16.85 12.10 7.35 2.60
WATER LEVEL AND DATE	16.10/82 17.10/82 16.10/82 17.10/82 18.10/82 19.10/82 17.10/82 19.10/82 18.10/82
CEMENTED CLEANED OUT	
CASING DURING DRILLING	Ø 89 mm.
Ø OF CORE	Ø 72. Ø 59.2 mm.
DRILLING METHOD	DRY DRILLING

TESTS : σ_c (Kg/cm ²)				
WATER PRESSURE				
LENGTH OF SECTIONS TESTED: 3 m				
TESTS				
LUGEON UNITS				
ROCK CLASSIFICATION				
HARDNESS				
RELATIVE DENSITY				
CONSISTENCY				
CORE BARREL				
DRILL WATER LOSS %				
CORE LOSS %				
R Q D %				
FRACTURE LOG				
WEATHERING				
STRUCTURES				
DIAGRAM				
LAYER TYPE				
GEOLOGICAL DESCRIPTION				
DRILLED LENGTH (m)				
R.L (m.d.s.l)				
WATER LEVEL AND DATE				
CEMENTED CLEANED OUT				
CASING DURING DRILLING				
Ø OF CORE				
DRILLING METHOD				

12.5
7.5
2.5

D CL D CL D CL

H A R D

TTCB / STEEL BITS

TTCB/DIAMOND BITS

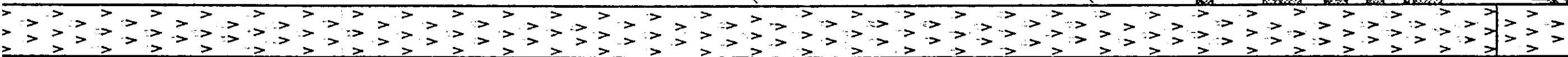
75
25

75
25

75
25

50
10
2

D
HW
SW



D A C I T I C T U F F

Moderately weathered dacitic tuff, light grey, grey and light brown, fractured, jointed, weakly cemented, hard, mostly broken core except on depth: (31.5-31.60; 32.80-33.70; 34.20-34.80; 35.20-35.60; 36.10-36.20; 36.30-37.00) m inclined joint shown on depth: (20.80; 28.70; 31.30; 33.00; 33.20; 34.50; 34.70) m

Slightly weathered dacitic tuff, grey, strongly cemented, hard, fractured, jointed, broken core, vertical jointed shown on depth: (39.10-39.50) m limonitic infilled shown on depth: (38.45-39.70; 39.80-39.90) m

3.50	4.00	4.75	5.50	6.00	6.80	7.60	8.30	10.00	11.20	12.30	13.20	14.30	15.75	17.30	18.50	19.00	19.85	21.10	22.50	23.40	25.10	26.00	27.30	28.15	29.10	30.00	31.15	32.50	34.00	35.25	36.35	37.70	38.30	39.00	40.00
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17.10.82	16.10.82	17.10.82	18.10.82	19.10.82	17.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82	18.10.82	19.10.82
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Ø 89 mm.

Ø 52 mm.

W A T E R F L U S H .

DRILLING REPORT

HOLE No.: B 28

PROJECT : KOTAPANJANG H.E.R.P.

LOCALITY : QUARRY SITE (QR-III)

CO-ORDINATES : N 708.389,67
E 30730,08

R.L GROUND SURFACE (m.d.s.l) : +223.01 m.

DEVIATION FROM VERTICAL : 0°

R.L BOTTOM OF HOLE (m.d.s.l) : +163.01 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 60.00 m.

SCALE : 1:100.

Contractor : PT.WIRATMAN & Ass. Driller : DJEMINGAN.

Drilling rig : TONE-TDC. Started : OCTOBER 2. 1982.

Finished : OCTOBER 12. 1982. Logged by :

Date : OCTOBER 13. 1982. Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)		WATER PRESSURE TESTS		LUGEON UNITS		LENGTH OF SECTIONS TESTED: 3m.		L/min/m.																													
ROCK CLASSIFICATION	D	CL	CM																																		
HARDNESS									H-A-R-D																												
RELATIVE DENSITY																																					
CONSISTENCY									STIFF TO HARD																												
CORE BARREL	S.T.C.B	D.T.C.B	T.T.C.B						S.T.C.B																												
DRILL WATER LOSS %									T.T.C.B / STEEL BR																												
CORE LOSS %																																					
R.Q.D %																																					
FRACTURE LOG																																					
WEATHERING	CW	MW	F																																		
STRUCTURES																																					
DIAGRAM																																					
LAYER TYPE	RESIDUAL SOIL								DACITIC TUFF																												
GEOLOGICAL DESCRIPTION	Highly weathered dacitic tuff represents of clayey silt, gravelly, grey, stiff to hard, rather cemented with limonitic infilled.								Moderately weathered dacitic tuff, grey spotted, brown, weakly cemented, hard, fractured, jointed, broken core. Inclined joint shown on depth: (11.10, 11.25, 11.30, 11.50, 11.60, 11.70, 15.30, 15.50, 15.70, 17.80, 19.80, 27.80, 30.00, 30.30, 30.70, 36.50) m. Vertical joint shown on depth: (23.30-23.40, 28.20-28.40, 40.80-41.00) m. Broken core shown on depth: (16.00-16.20, 18.40-18.90, 19.60-19.80, 20.00-21.00, 21.70-22.00, 23.00-23.10, 26.60-27.50, 32.00-32.40, 33.00-33.20, 33.40-33.60, 33.80-34.00, 37.00-42.20) m.																												
DRILLED LENGTH (m)	0.00	0.50	1.00	1.60	1.85	2.10	2.30	2.50	2.70	2.90	3.10	3.30	3.50	3.70	3.90	4.10	4.30	4.50	4.70	4.90	5.00	6.50	9.50	11.50	12.50	13.75	15.70	16.20	17.00	19.00	20.20	21.30	22.70				
R.L (m. a.s.l)	+223.01																																				
WATER LEVEL AND DATE																																					
CEMENTED CLEANED OUT CASING DURING DRILLING																																					
Ø OF CORE	Ø 76mm	Ø 59.2mm																																			
DRILLING METHOD																																					

12.5
2.5
2.5

D

CM

CL

CM

-H - A R - D

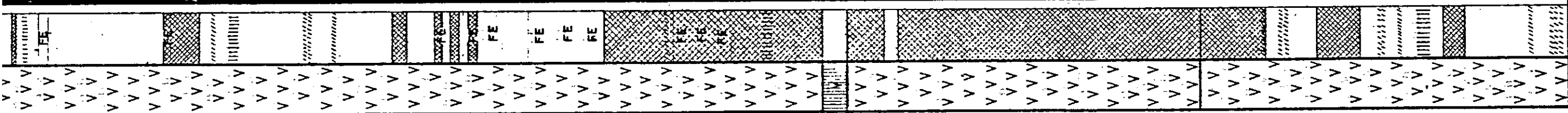
HW

T. T. C. B / STEEL BITS

T. T. C. B / DIAMOND BITS

BITS

75
25
75
25
75
25
50
10
2
D
HW
SW



RESIDUAL SOIL

DACCITIC TUFF

33.80-34.00, 37.00-42.20)m.
Limonitic vein shown on depth:
(4.55-4.65, 6.50-6.70, 8.00-8.05,
9.10-9.15, 11.50-12.05, 13.00-
13.75, 15.18-15.20, 16.40-17.00,
18.50-18.95, 19.05-19.50, 21.70-
22.70, 23.70-23.90, 26.70-26.80,
33.20-33.25, 33.70-34.60, 35.20-
37.00, 38.70-40.00)m.

Highly weathered dacitic tuff
represents of clayey silt, grey,
brown, friable, hard, rather
cemented.

Moderately weathered dacitic
tuff, brownish grey, weakly ce-
mented, hard, fractured, jointed,
mostly with limonitic infilled
and, mostly broken core except
on 43.70-44.00 m.

Slightly weathered dacitic tuff,
grey, strongly cemented, hard,
fractured, jointed, broken core,
inclined joint shown on depth:
(52.75, 53.15, 53.30, 55.50, 55.60,
56.00, 59.10, 59.60, 59.70, 59.80)m
Vertical joint shown on depth:
(56.40-56.70)m.
Broken core shown on depth:
(51.20-52.75 54.00-55.00, 57.00-
57.50)m.

24.45
26.00
27.50
28.75
31.00
32.40
34.00
34.70
36.00
37.30
39.00
40.00
41.00
42.20
42.80
44.40
46.00
47.00
47.75
48.60
50.00
51.00
51.20
52.00
53.20
54.00
56.35
57.70
60.00

8.10.82
9.10.82

11.10.82
10.10.82

12.10.82

177.81
177.81

163.01

Ø 52 mm.

WATER F L U S H

DRILLING REPORT

HOLE No : B. 29

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : BORROW AREA (MUARA MAHAT)

CO-ORDINATES : N 703.245.76
E 30.982.57

R.L GROUND SURFACE (m.a.s.l) : +48.64 m.

DEVIATION FROM VERTICAL : 0°

R.L BOTTOM OF HOLE (m.a.s.l) : +33.64 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 15.00 m.

SCALE : 1 : 100.

Contractor : PT.WIRATMAN & Ass. Driller : U.Ruswandi.

Started : October 11. 1982.

Finished : October 14. 1982. Logged by :

Date : October 15.1982

Checked by :

Remarks :

TESTS		WATER PRESSURE TESTS	
LENGTH OF SECTIONS TESTED : 3m		L/min/m	
LUGEON UNITS		4 8 12	
		10	12.5
		5	7.5
		0	2.5
HARDNESS			
RELATIVE DENSITY		VERY LOOSE TO LOOSE	LOOSE
CONSISTENCY		STIFF TO VERY HARD	
CORE BARREL	STCB	STCB	
	DTCB		
	TTCB		
DRILL WATER LOSS %	100		75
	50		25
	0		
CORE LOSS %	100		75
	50		25
	0		
R.Q. D %	100		75
	50		25
	0		
FRACTURE LOG	20		50
	4		10
	1		2
WEATHERING	CW		D
	MW		HW
	F		SW
STRUCTURES			
DIAGRAM			
LAYER TYPE	SAND	GRAVEL & SAND	
GEOLOGICAL DESCRIPTION	Sand, brown, very fine to fine grain, very loose to loose, poorly graded.	Gravel and sand mixture, greyish brown to brown, fine to coarse grain, well graded, loose. Gravel: ± 60%, subrounded, hard, average φ: ± 2-3cm, maximum φ: 5cm. Sand: ± 40%, very fine to coarse grain, well graded, mostly quartz fragments.	
DRILLED LENGTH (m)	0.50	2.70	10.10
	1.00	3.00	10.10
	1.50	3.50	10.10
	2.00	4.00	10.10
	2.50	4.50	10.10
	3.00	5.00	10.10
	3.50	5.50	10.10
	4.00	6.00	10.10
	4.50	6.50	10.10
	5.00	7.00	10.10
	5.50	7.50	10.10
	6.00	8.00	10.10
	6.50	8.50	10.10
	7.00	9.00	10.10
	7.50	9.50	10.10
	8.00	10.00	10.10
	8.50	10.50	10.10
	9.00	11.00	10.10
	9.50	11.50	10.10
	10.00	12.00	10.10
	10.50	12.50	10.10
	11.00	13.00	10.10
	11.50	13.50	10.10
	12.00	14.00	10.10
	12.50	14.50	10.10
	13.00	15.00	10.10
	13.50		10.10
	14.00		10.10
	14.50		10.10
	15.00		10.10
R.L (m.a.s.l)	-48.64	-46.24	+33.64
WATER LEVEL AND DATE	10.11.82	10.12.82	10.13.82
CEMENTED CLEANED OUT CASING DURING DRILLING			
Ø OF CORE	Ø 59.2mm Ø 89mm		
DRILLING METHOD	DRY DRILLING		

DRILLING REPORT

HOLE No : B.30.

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : BORROW AREA (NEW M. MAHAT)

CO-ORDINATES : N - 261.75.
E + 407.16.

R.L GROUND SURFACE (m.a.s.l) : +47.65 m.

DEVIATION FROM VERTICAL : 0°.

R.L BOTTOM OF HOLE (m.a.s.l) : +42.65 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 5.00 m.

SCALE : 1 : 50.

Contractor : PT. WIRATMAN & Ass. Driller : Wakin.

Drilling rig : YBM - YS01 Started : October. 21 .1982.

Finished : October 22 .1982. Logged by :

Checked by :

Remarks :

TESTS		WATER PRESSURE	LENGTH OF SECTIONS TESTED: 3m
LUGEON UNITS		10	
		5	
		0	
		0	
HARDNESS			
RELATIVE DENSITY		VERY LOOSE TO LOOSE	VERY DENSE
CONSISTENCY			
CORE BARREL	S.T.C.B	S T C B	
	D.T.C.B		
	T.T.C.B		
DRILL WATER LOSS %	100	75	
	50	25	
	0		
CORE LOSS %	100	75	
	50	25	
	0		
R.Q.D %	100	75	
	50	25	
	0		
FRACTURE LOG	20	50	
	4	10	
	1	2	
WEATHERING	CW	D	
	MW	HW	
	F	SW	
STRUCTURES			
DIAGRAM			
LAYER TYPE		GRAVEL & SAND	
GEOLOGICAL DESCRIPTION		<p>Gravel and Sand mixture, brown, fine to coarse grain, well graded, very loose to loose, on the upper part mostly gravels.</p> <p>Gravel: ±80%, subrounded hard. Average Ø ±0.02 up to 0.05 m. Maximum Ø ±0.10 m.</p> <p>Sand : ±20%, fine to coarse, well graded, mostly quartz fragments.</p> <p>Highly weathered Sandstone, silty represent of very dense sand, rather cemented very fine to fine grain, poorly graded.</p>	
DRILLED LENGTH (m)	0.00	0.50	1.10
		1.70	2.50
		3.00	3.20
		3.35	3.70
		3.90	4.10
		4.30	4.50
		4.70	5.00
R.L (m.a.s.l)	+47.65	+43.95	+42.65
WATER LEVEL AND DATE			
CEMENTED CLEANED OUT			
CASING DURING DRILLING Ø OF CORE			
DRILLING METHOD		DRY DRILLING	

DRILLING REPORT

HOLE No : B.31

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR-IV)

CO-ORDINATES : N 1522.78
E 2143.69

R.L. GROUND SURFACE (m.d.s.l) : 114.77 m

DEVIATION FROM VERTICAL : 0°

R.L. BOTTOM OF HOLE (m.d.s.l) : 64.77 m

DIRECTION : VERTICAL

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m

SCALE : 1 : 100

Contractor : PT. WIRATMAN & Ass. Driller : WAKIN

Drilling rig : YBM-Y SO 1 Started : OCTOBER 14. 1982

Finished : OCTOBER 16. 1982 Logged by:

Date : OCTOBER 17. 1982 Checked by:

Remarks :

TESTS : σ_c (Kg/cm ²)		64	
WATER PRESSURE TESTS	LENGTH OF SECTIONS TESTED: 3m.	L/min 12	
LUGEON UNITS	10	0	
ROCK CLASSIFICATION	D	CL	CM
HARDNESS		CH	CL
RELATIVE DENSITY		CM	CL
CONSISTENCY	SOFT	VERY STIFF TO HARD	
CORE BARREL	STCB	ST.C.B	
	DTCB		
	TTCB		
DRILL WATER LOSS %	100		
	50		
	0		
CORE LOSS %	100		
	50		
	0		
R.Q.D %	100		
	50		
	0		
FRACTURE LOG	20		
	4		
	1		
WEATHERING	CW		
	MW		
	F		
STRUCTURES			
DIAGRAM			
LAYER TYPE	RESIDUAL SOIL		D A C
GEOLOGICAL DESCRIPTION	Completely weathered dacitic tuff represents of silty clay, brown, soft, firm, plastic.		
	Highly weathered dacitic tuff represents of clayey silt, brownish grey to grey and brown, very stiff to hard, rather cemented, slightly to non plastic.		
DRILLED LENGTH (m)	0.00		
	0.50		
	1.00		
	1.70		
	2.30		
	2.80		
	3.50		
	5.00		
	6.50		
	8.00		
	9.20		
	10.80		
	12.40		
	13.70		
	15.30		
	15.50		
	17.00		
	18.50		
	20.00		
	21.30		
	22.70		
R.L (m.d.s.l)	114.77		
	112.07		
	111.97		
WATER LEVEL AND DATE	14.10.82		
	15.10.82		
	15.10.82		
	15.10.82		
	15.10.82		
	15.10.82		
	16.10.82		
	16.10.82		
	16.10.82		
CEMENTED CLEANED OUT CASING DURING DRILLING			
Ø OF CORE	Ø 59.2 mm	Ø 89 mm	Ø 55 mm
DRILLING METHOD	DRY DRILLING		- WATER FLUSH

125
7.5
2.5

CM CL CM CL CM CL CM CL CM CL CM

HARD

T.T.C.B / STEEL BITS

75
25
75
25
75
25
50
10
2
D
HW
SW

DACITIC TUFF

Moderately weathered dacitic tuff, grey, weakly cemented, hard, jointed, fractured broken core, mostly with limonitic (iron oxide) infilled. Inclined joint shown on depth: (2.90-3.20; 9.65; 11.30-13.70; 15.60; 15.70; 15.85; 16.00; 16.30; 16.50; 16.85; 17.00; 17.10; 17.40; 17.75; 19.10; 19.30; 19.40; 19.60; 20.30; 20.40; 21.00; 21.20; 21.70; 22.00; 22.70; 25.75; 26.00; 27.10; 30.45; 30.65; 31.00; 32.30; 32.50; 32.80; 33.20; 33.30; 33.70; 33.80; 34.00; 34.50; 35.20; 35.80; 40.35; 40.50; 41.35; 41.75; 43.90; 44.50; 45.85; 46.35; 46.90; 47.40; 47.50; 48.75; 49.10; 49.45) m
Vertical joint shown on depth: (18.45-18.80; 32.70-33.00; 37.70-38.00) m
Broken core shown on depth: (9.00-9.20; 17.10-17.20; 24.00-24.55; 31.35-31.45; 32.70-33.00; 34.20-34.60; 37.00-37.20; 37.65-38.00; 38.50-38.70; 41.75-42.00; 43.00-43.40; 49.70-49.80) m
Limonitic vein shown on depth: (8.25-8.65; 24.00-24.70; 37.20-37.60; 38.20-39.60.) m

13.70 15.30 15.50 17.00 18.50 20.00 21.30 22.70 24.30 25.90 27.30 28.00 28.70 29.60 31.00 31.40 33.00 34.40 35.00 36.00 37.30 37.90 38.75 40.00 40.35 41.00 42.00 42.80 44.30 45.90 47.45 48.85 50.00

64.77

15.10.82 15.10.82 15.10.82

Ø 55 mm Ø 592 mm Ø 55 mm Ø 592 mm Ø 55 mm Ø 592 mm

WATER FLUSH DRY WATER FLUSH DRY DRILLING WATER FLUSH DRY DRILLING

DRILLING REPORT

HOLE No.: B.32

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR-IV)

CO-ORDINATES : N 1465.26
E 2200.10

R.L GROUND SURFACE (m.d.s.l) : +147.71 m.

DEVIATION FROM VERTICAL : 0°

R.L BOTTOM OF HOLE (m.d.s.l) : +97.71 m.

DIRECTION : VERTICAL.

TOTAL LENGTH OF DRILL HOLE (m) : 50.00 m.

SCALE : 1 : 100.

Contractor : PT. WIRATMAN & Ass. Driller: WAKIN.

Started: OCTOBER 10. 1982.

Finished : OCTOBER. 13. 1982. Logged by:

Date : OCTOBER 14. 1982

Checked by:

Remarks :

DRILLING METHOD : CITY DRILLING

Ø OF CORE : Ø 59.2 mm

CEMENTED CLEANED OUT CASING DURING DRILLING

WATER LEVEL AND DATE

R.L (m.d.s.l)

DRILLED LENGTH (m)

GEOLOGICAL DESCRIPTION

LAYER TYPE

DIAGRAM

STRUCTURES

WEATHERING

FRACTURE LOG

R.Q.D %

CORE LOSS %

DRILL WATER LOSS %

CORE BARREL S.T.C.B
D.T.C.B
T.T.C.B

CONSISTENCY FIRM → HARD

RELATIVE DENSITY

HARDNESS

ROCK CLASSIFICATION

WATER PRESSURE TESTS LUGEON UNITS

TESTS: σ_c (Kg/cm²)
LENGTH OF SECTIONS TESTED: 3m.
L/min/m.

Ø 89 mm

Ø 59.2 mm

12.5
7.5
2.5

CM

CL

CM

CL

CM

CL
S
D

CM

CL

CM

H A R D

T.T.C.B / STEEL BITS

75
25

75
25

75
25

50
10
2

D

HW

SW

DACITIC TUFF

Moderately weathered dacitic tuff, grey spotted brown, fractured, jointed, broken core, mostly with limonitic infilled (iron oxide) inclined joint shown on depth: (15.10; 15.0; 15.50; 15.60; 16.10; 16.50; 17.15; 17.65; 17.85; 18.50; 18.80; 18.90; 19.2; 19.40; 21.60; 22.40; 23.20; 25.0; 29.80; 40.50; 40.80; 43.80; 44.0; 45.05; 45.60; 46.20; 46.70; 47.05; 47.40; 47.50; 48.30; 49.10; 49.89)m

Vertical joint shown on depth: (2.5.30 - 25.60; 45.75 - 46.10; 47.60 - 48.60) m

Broken core shown on depth: (23.10 - 23.60; 23.90 - 24.15; 25.60 - 26.15; 27.00 - 27.40; 28.55 - 28.70; 30.01 - 30.10; 30.55 - 31.10; 32.00 - 32.20; 32.80 - 33.10; 35.40 - 36.00)m

Limonitic vein on depth: (30.70 - 30.80; 47.60 - 48.10)m.

13.50
14.00
15.00
16.00
17.15
18.70
20.25
21.00
22.55
23.50
24.50
26.00
27.50
29.00
30.55
31.05
32.50
34.00
35.00
36.00
37.50
38.00
39.50
41.00
42.50
44.00
45.55
47.00
48.50

494.71 50.00

12.10.82

13.07.82

Ø 52 mm
WATER FLUSH

DRILLING REPORT

HOLE No : **B.33**

PROJECT : KOTAPANJANG H.E.P.P.

LOCALITY : QUARRY SITE (QR-I)

R.L GROUND SURFACE (m.a.s.l) : +79.01 m.

R.L BOTTOM OF HOLE (m.d.s.l) : +54.51 m.

TOTAL LENGTH OF DRILL HOLE (m) : 24.50 m.

CO-ORDINATES : N 701.824,19
E 31.031,18

DEVIATION FROM VERTICAL : 0°

DIRECTION : VERTICAL.

SCALE : 1 : 100.

Contractor : PT WIRATMAN & Ass. Driller : U.Ruswandy

Drilling rig : YBM-YSO 1 Started : October 2, 1982.

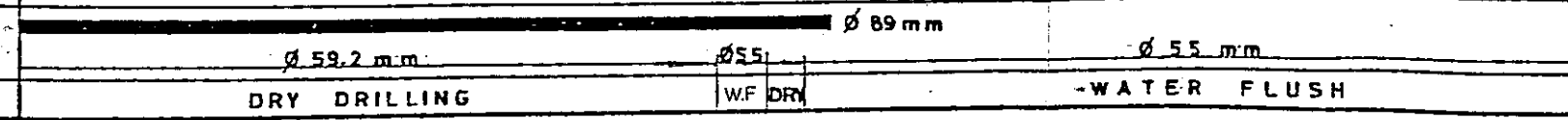
Finished : October 6, 1982. Logged by :

Date : Checked by :

Remarks :

TESTS : σ_c (Kg/cm ²)				
WATER PRESSURE	LENGTH OF SECTIONS TESTED : 3m.	4	8	12
TESTS	LUGEON UNITS	10	5	0
ROCK CLASSIFICATION			D	C _M
HARDNESS			HARD	
RELATIVE DENSITY			DENSE	
CONSISTENCY	SOFT	FIRM TO STIFF	HARD	
CORE BARREL	STCB	STCB		STCB
	DTCB			
	TTCB		TTCB	TTCB
DRILL WATER LOSS %	100	50	0	
CORE LOSS %	100	50	0	
R.Q.D %	100	50	0	
FRACTURE LOG	20	4	1	
WEATHERING	CW	[Weathering patterns]		
	MW			
	F			
STRUCTURES				
DIAGRAM	[Geological diagram]			
LAYER TYPE	RESIDUAL SOIL	SILTY CLAY	SILTY SAND	CLAY
GEOLOGICAL DESCRIPTION	Humus, brownish black, soft, slightly plastic.			
	Completely weathered sandstone represents of silty clay, brown, firm to stiff, plastic.			
GEOLOGICAL DESCRIPTION	Highly weathered sandstone represents of silty sand, reddish brown, to brown, fine grain, poorly graded, dense, rather cemented.			
	Clay, grey to blackish grey, stiff to hard, plastic.			
GEOLOGICAL DESCRIPTION	Moderately weathered sandstone, light grey with some spotted brown, poor fractured, strongly cemented, hard, on crack at 20.80 m depth limonitic infilled (iron oxide)			

DRILLED LENGTH (m)	0.00	0.75	0.50	1.00	1.70	2.25	3.00	3.50	4.00	4.50	5.00	5.45	5.70	6.10	6.50	7.00	7.85	8.60	8.90	9.80	10.70	10.23	10.75	12.60	14.50	14.70	17.15	18.60	17.86	19.90	20.52	
R.L (m.a.s.l)	+79.01	+78.76							+75.01									+70.16				+68.81										
WATER LEVEL AND DATE											10.3.82		10.5.82			10.4.82								10.5.82		10.6.82						
CEMENTED CLEANED OUT CASING DURING DRILLING																																
Ø OF CORE																																
DRILLING METHOD																																



R.L BOTTOM OF HOLE (m.d.s.l) : 54.51 m.
 TOTAL LENGTH OF DRILL HOLE (m) : 24.50 m.

DIRECTION : VERTICAL.
 SCALE : 1 : 100.

Contractor : PT WIRATMAN & Ass. Driller : U. Ruswandy
 Finished : October 6, 1982. Logged by :

Drilling rig : YBM-YSO 1 Started : October 2, 1982.
 Checked by :

Remarks :

TESTS: σ_c (Kg/cm ²)		407	397
WATER PRESSURE TESTS	LENGTH OF SECTIONS TESTED: 3m.		
	LUGEON UNITS	10	12.5
		5	7.5
		0	2.5
ROCK CLASSIFICATION		D	C _M C _H C _M C _H
HARDNESS		HARD	
RELATIVE DENSITY		DENSE	
CONSISTENCY		SOFT FIRM TO STIFF	HARD
CORE BARREL	STCB	STCB	
	DTCB		STCB
	TTCB	TTCB	TTCB
DRILL WATER LOSS %			75 25
CORE LOSS %			75 25
R.Q.D %			75 25
FRACTURE LOG			50
			10
			2
WEATHERING	CW		D
	MW		HW
	F		SW
STRUCTURES			
DIAGRAM			
LAYER TYPE	RESIDUAL SOIL SILTY CLAY	SILTY SAND	CLAY SANDSTONE
GEOLOGICAL DESCRIPTION	Humus, brownish black, soft, slightly plastic. Completely weathered sandstone represents of silty clay, brown, firm to stiff, plastic.	Highly weathered sandstone represents of silty sand, reddish brown, to brown, fine grain, poorly graded, dense, rather cemented.	Clay grey to blackish grey, silt to hard, plastic. Moderately weathered sandstone, light grey with some spotted brown, poor fractured, strongly cemented, hard, on crack at 20.80 m depth limonitic infilled (iron oxide)
DRILLED LENGTH (m)	0.00 0.25 0.50 1.00 1.70 2.25 3.00 3.50 4.00 4.50 5.00 5.45 5.70 6.10 6.50 7.00 7.85 8.60 8.95 9.30 9.80 10.20 10.75 12.50 14.50 14.70 17.15 18.80 18.88 19.30 20.52 23.00 24.50		
R.L (m.a.s.l.)	79.01 78.75 75.01	70.16 68.81	54.51
WATER LEVEL AND DATE		10.3.82 10.5.82 10.4.82	10.5.82 10.6.82 10.6.82
CEMENTED CLEANED OUT CASING DURING DRILLING			
Ø OF CORE		Ø 59.2 mm	Ø 89 mm Ø 55 mm
DRILLING METHOD		DRY DRILLING	W.F DRY WATER FLUSH

DRILLING REPORT

HOLE No. B-34

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : DAM AXIS - 4

ELEVATION OF GROUND SURFACE : 105.92 m

TOTAL LENGTH OF DRILL HOLE : 50.0 m

DIRECTION : 90°

COORDINATES : X = 2081.84
Y = 2124.12

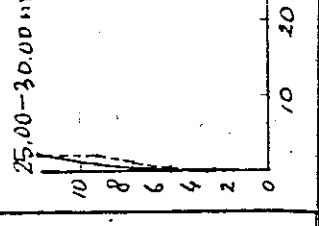
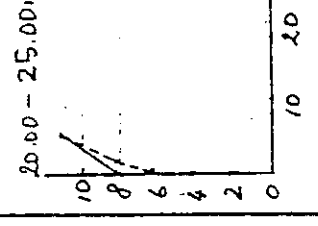
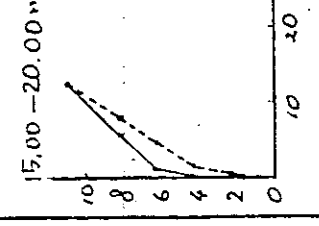
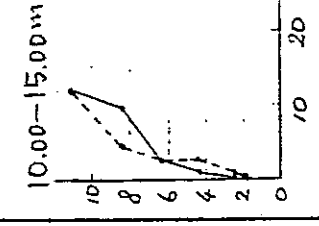
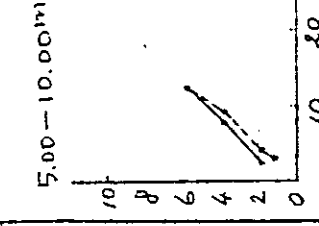
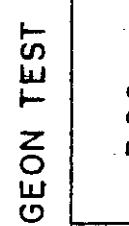
DATE : BEGINNING : 7 Dec, '83
ENDING : 22 Dec, '83

DRILLING RIG : Y50-1

OPERATOR : SUPARMAJI
SUPERVISOR : NAKAMATA

G.W.L.:

CORE BARREL	STCB	DTCB	TTCB	CASING DURING DRILLING DIAMETER OF CORE	DRILLING METHOD	WATER LEVEL AND DATE	DEPTH (m)	COLUMN SECTION	LAYER TYPE	COLOUR	HARDNESS	SHAPE OF CORE	GEOLOGICAL DESCRIPTION	DRILL WATER LOSS (%)	R. Q. D. RECOVERY (%)	ROCK CLASSIFICATION	LUGEON UNITS	LUGEON TEST	TESTS
					Dry drilling	1.00 7-12-83	2.50	Soil	Soil	Light brown	Soft	Sand and gravel	Top soil Clayey material						
						1.65 8-12-83	3.60	VVV		Light grey ~ Grey	Soft	Short Column	Highly weathered rock as clayey soil						
							5.10	VVV			Hard	Broken	Soft and porous rock Put iron oxide vein Thickness 5mm						
							6.60	VVV		Brownish	Hard	Broken	Highly weathered as clayey soil						
								VVV		Light grey ~ Grey	Soft	Short Column	Porous rock Crack has a fresh face and contact						
								VVV		Light brown	Medium hard	Column	Harden by the pollution of iron oxide vein Mostly high angle crack						
						5.66 10-12-83		VVV		Light brown	Soft	Splinter	Mostly high angle crack (70°) The face is polluted by iron oxide to brown colour						
						4.85 13-12-83		VVV		Brownish grey	Soft	Short Column	Put Quartz vein combined with iron oxide Core samples are easily crushed by hammer. The colour of crack fresh						
						11.20 14-12-83	14.70	VVV		Brownish grey	Soft	Short Column	Many Calcite vein (T=1mm) is penetrated in small faults. 16.30-16.80m harden by the pollution of iron oxide vein 60° joints are found at the interval of 5cm						
								VVV		Light Brown		Short Column							
								VVV		Grey		Short Column							
								VVV		Brownish Grey		Club Short Column	Harden spread 3-5cm by the pollution / penetration of iron oxide vein (T=2-3mm)						
								VVV		Grey-Brown		Column	23.30-23.40m Cleavage (T=0.3cm) Crushed easily by the strike of hammer						
								VVV		Grey		Club Short Column	Put very thin Calcite film. cracks are contact, but polluted (3mm)						
								VVV		Grey ~ Brownish grey		Column	Sandy rock Calcite veins are few. 26.80m Fe vein T=1cm open 1mm 27.35m Fe vein T=0.5cm open 0.5mm 27.71-27.77m. Polluted by the presence of iron oxide vein 28.30-28.70m High angle cracks	15					
						9.01 17-12-83	25.00	VVV				Medium							



Depth (m)	Interval (m)	Core Description	Sample Type	Color	Hardness	Notes	Diagrams	Other
10-12-83	9.7	by iron oxide to brown colour Put Quartz vein combined with iron oxide Core samples are easily crushed by hammer. The colour of crack fresh	Short Column	Brownish grey	Soft			
13-12-83	10.0	Many Calcite veins (T=1mm) is penetrated in small faults. 14.30-16.80m harden by the pollution of iron oxide vein 60° joints are found at the interval of 5cm	Short Column Column	Light Brown				
14-12-83	3.5	Harden spread 3-5cm by the pollution / penetration of iron oxide vein (T=2-3mm) 23.30-23.40m Cleavage (T=0.3cm) Crushed easily by the strike of hammer	Short Column Column	Grey				
16-12-83	1.6	Put very thin Calcite film, cracks are contact, but polluted (3mm) Sourdy rock Calcite veins are few. 26.80m Fe vein T=1cm open 1mm 27.35m Fe vein T=0.5cm open 0.5mm 27.71-27.77m Polluted by the penetration of iron oxide vein 28.30-28.70m High angle cracks are found at the interval of 1-2cm 29.28-29.36m Iron oxide veins are penetrated in all directions	Club short Column Column Short Column Column	Brownish Grey				
18-12-83	4.1		Column	Grey ~ Brownish grey	Medium hard			
19-12-83	5.0		Short Column	Grey				
20-12-83	14.6		Short Column Splinter Broken	Light Brown Grey Light Brown Dark Brown				
21-12-83	18.5		Short Column Splinter	Grey Light brown				
22-12-83								
23-12-83								

Water flush drilling

DRILLING REPORT

HOLE No. B-35

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : DAMAKS - 4

ELEVATION OF GROUND SURFACE : 66.73 m

TOTAL LENGTH OF DRILL HOLE : 500 m

DIRECTION : 90°

COORDINATES : X = 2096.79
Y = 2042.89

DATE : BEGINNING : 5 Dec. '83
ENDING : 28 Dec. '83

DRILLING RIG :

OPERATOR : MEDIK
SUPERVISOR : NAKAMATA

G.W.L. :

TESTS	LUGEON TEST		ROCK CLASSIFICATION	R. Q. D. RECOVERY (%)	DRILL WATER LOSS (%)	GEOLOGICAL DESCRIPTION	SHAPE OF CORE	HARDNESS	COLOUR	LAYER TYPE	COLUMN SECTION	DEPTH (m)	WATER LEVEL AND DATE	CORE BARREL	CASING DURING DRILLING DIAMETER OF CORE	DRILLING METHOD
	P-Q Curve	LUGEON UNITS														
		57.0	D.			Top Soil Clayey material Very Soft rock Sunked by finger Broken by nail easily The characteristic is clayey Crushable by hand	Short Column	Hard ~ Soft	Light Brown	Soil		1.50				
		180	CL		10	Shaved by nail Cracks angle 60~45° Put. Fe-vein (thickness 3~5mm) Cracks to every-where 13.50m gets a little hard but, broken by finger pressure	Broken Column	Soft	Brownish grey			2.50	0.09 7.12.83			
		3.0	CM		25	Rock cores are separated by the low angle crack (15°) 17.55~18.00m porous Quartz vein T=1.5cm 18.70~18.80m Polluted 19.15~19.30m to brown colour	Short Column	Medium hard	Brown			8.50	0.37 8.12.83			
		2.6	CH		10	Cracks are contact 19.95~20.30m Put thin quartz-vein to every where The length of the longest core is 165 cm	Column	Hard	Dark grey			9.60	10.46 14.12.83			
		11.0	CH near B		5	The change of colours are distinct Cracks are stained to dark brown. Rock characteristic is fresh and hard	Club	Very hard	Brown-Grey			14.50	10.07 14.12.83			
			CL S CM				Club-Column	Soft	Dark grey			19.30	18.80 22.12.83			
			CH near CM				Spinter-Column	Very hard	Dark grey			20.50	18.80 22.12.83			
							Short Column					28.35				
							Short Column					29.80				

Dry drilling

Water flush

Time	Depth (m)	Remarks	Core Type	Interval (m)	Notes
8.37 8.12.83	14.50	Cracks to every- where 13.50m gets a little hard but broken by finger pressure	CL	18.0	
11.46 14.12.83	19.30	Rock Cores are separated by the low angle crack (15°) 17.55-18.00m porous Quartz vein T=1.5cm 18.70-18.80m Polyluted 19.15-19.30m to brown colour	CM	3.0	
	20.50		CH	2.6	
12.47 14.12.83	25.35	Put thin quartz-vein to every where The length of the longest core is 16.5 cm	CH	2.6	
			CH near B	11.0	
18.00 22.12.83	28.35	The change of colours are distinct Cracks are stained to dark brown.	CL	11.0	
			S CM	5.7	
16.70 24.12.83	31.20	Rock characteristic is fresh and hard Cracks are stained to brownish colour	CH near CM	4.0	
			CM	31.0	
16.70 25.12.83	36.80	Put quartz vein at high angle cracks (45°) interval 3-5cm Locally the shape of core is splinter.	CH	5.7	
			CM	4.0	
24.12.83	42.50	33.40-33.50m } Cracks 34.20-34.30m } are 34.90-35.00m } Stained 36.75-36.80m } Very soft rock as clay	CM	4.0	
			CH near CM	31.0	
24.12.83	43.20	42.50-42.80m Put quartz vein Soften to clayey materials Put calcite crystals in the cracks (low angle) much contact faults are found.	CH	31.0	
			CL	0.3	
27.12.83	45.10		CH	0.3	
			S B		
28.12.83	50.00				

Dacitic Tuff

Water flush drilling

DRILLING REPORT

HOLE No. B-36

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : DAM AXIS-4

ELEVATION OF GROUND SURFACE : 105.92 m

TOTAL LENGTH OF DRILL HOLE : 65.0 m

COORDINATES : X = 2097.33
Y = 1990.99

DIRECTION : 45°

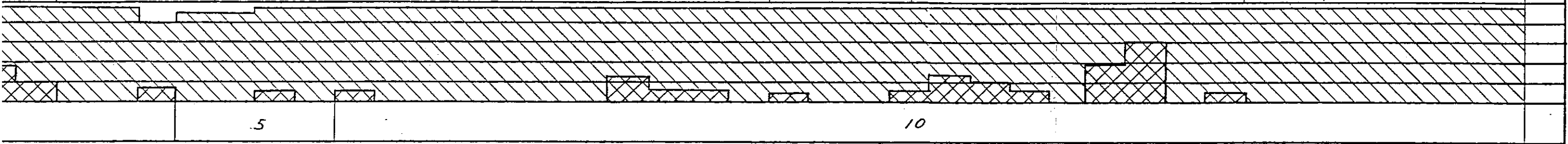
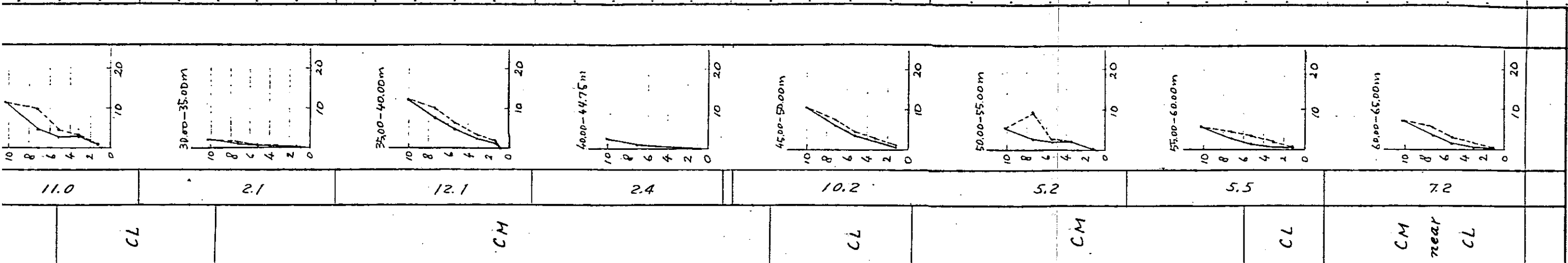
DATE : BEGINNING : 24 Nov. '83
ENDING : 24 Jan. '84

OPERATOR : MEDIK
SUPERVISOR : IMAM S.

G.W.L.:

TESTS		LUGEON TEST	
		P-Q Curve	LUGEON UNITS
		17.7	3.3
ROCK CLASSIFICATION		D	CL near CM
R. Q. D. RECOVERY (%)		20	70
DRILL WATER LOSS (%)		50	20
GEOLOGICAL DESCRIPTION		20	50
SHAPE OF CORE		40	60
HARDNESS		40	40
COLOUR		40	40
LAYER TYPE		40	40
COLUMN SECTION		40	40
DEPTH (m)		40	40
WATER LEVEL AND DATE		40	40
CORE BARREL	STCB	40	40
	DTCB	40	40
	TTCB	40	40
CASING DURING DRILLING		40	40
DIAMETER OF CORE		40	40
DRILLING METHOD		40	40

Water flush drilling

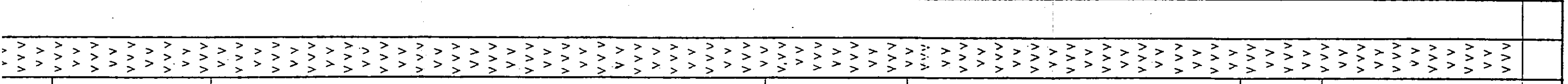


rock is hard, but mostly the cores are broken as splinter.

Lower part from dep. 44.00m, the quality of rock is Medium hard to soft. Shape of cores are mostly short columnar, due to the hard-ness. It's not stained with grey to greenish grey.

Short Column	Broken	Short Column	Broken	Short Column	Broken	Short Column	Broken
Hard	Soft	Hard		Soft		Medium hard	

Grey



28.00	32.00	44.00	48.50	58.00	60.00	65.00
1.75 23-1-84	1.60 24-1-84	1.50 25-1-84	1.40 27-1-84	1.35 30-1-84	1.25 3-2-84	1.35 4-2-84
			1.25 3-2-84	1.35 4-2-84	1.45 3-2-84	1.35 9-2-84
				1.75 10-2-84	1.05 12-2-84	1.25 13-2-84
				1.85 17-2-84		1.25 18-2-84
						1.85 19-2-84
						1.35 20-2-84

DRILLING REPORT

HOLE No. B-38

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : DAM AXIS - 4

ELEVATION OF GROUND SURFACE : 90.34 m

TOTAL LENGTH OF DRILL HOLE : 50.0 m

DIRECTION : 90°

COORDINATES: X = 2124.63
Y = 1853.66

DATE BEGINNING : 29 Dec. - 83
ENDING : 23 Jan. - 84

DRILLING RIG :

OPERATOR : SUDARMAJI
SUPERVISOR : IMAM S.

G.W.L.:

TESTS	LUGEON TEST		ROCK CLASSIFICATION	R.O.D. RECOVERY (%)	DRILL WATER LOSS (%)	GEOLOGICAL DESCRIPTION	SHAPE OF CORE	HARDNESS	COLOUR	LAYER TYPE	COLUMN SECTION	DEPTH (m)	WATER LEVEL AND DATE	CORE BARREL	CASING DURING DRILLING	DIAMETER OF CORE	DRILLING METHOD
	P-Q Curve	LUGEON UNITS															
		23.7	D		30	The core is gravelly includes clayey materials	Short Column ~ Broken	Soft	Light brown		VVV	1.45	30-12-83	STCB			
		1.0	CL		30	Stained by iron oxides, and easy to smash by hammer	Column ~ Short Column	Medium hard	Brownish Grey		VVV	5.00	31-12-83	DTCB			
		1.5	CM		40	5.20 ~ 6.30 m Stained by iron oxides. Harder by the pollution of iron oxides 1cm thickness.	Column	Hard	Brownish Grey		VVV	11.00	7.90 2-1-84	TTCB			
		3.4	near CH		?	10.00 ~ 10.50 m Stained by iron oxides 13.10 ~ 13.20 m 16.30 ~ 16.50 m 18.30 ~ 18.40 m The shape of core is mainly columnar and the quality is fresh with greyish colour.	Club Column	Hard	Brownish Grey		VVV	19.60	14.30 2-1-84				
		27	CH			13.0 ~ 13.5 m Clear joints 10 pcs. intervals of 5 cm. 16.0 ~ 16.6 m Polluted by iron oxides. 19.60 ~ 21.00 m Put iron oxide vein thickness 1cm Hard and fresh excellent quality	Club Column	Hard	Brownish Grey		VVV	21.00	17.30 5-1-84 17.30 17-1-84				Water flush drilling

Core No.	Interval (m)	Core Type	Quality	Notes	Iron Content (g/t)
10	1.0	CM	Hard	Shape of core is mainly columnar and the quality is fresh with greyish colour.	1.0
15	1.5	near CH	Hard	13.0-13.5 m Clear joints 10 pcs. intervals of 5 cm.	1.5
34	3.4	CM	Medium hard	16.0-16.6 m Polluted by iron oxides.	3.4
27	2.7	near CH	Hard	19.60-21.00 m Put iron oxide vein thickness 1 cm Hard and fresh excellent quality	2.7
6.7	6.7	CM	Medium hard	32.30 m, 34.70 m Stained by iron oxides. Thickness of pollution is 1 cm.	6.7
3.6	3.6	CM near CH	Hard	Hard and fresh excellent quality	3.6
4.4	4.4	CM	Medium hard	41.60-41.70 m 42.00-42.20 m 43.30 m 43.50-43.80 m 44.00-44.05 m 45.00-45.05 m Stained by iron oxides softly	4.4
3.2	3.2	CM near CH	Hard		3.2

Water flush drilling

DRILLING REPORT

HOLE No. B - 39

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : QR - IV

ELEVATION OF GROUND SURFACE : 77.03 m

TOTAL LENGTH OF DRILL HOLE : 35.0 m

DIRECTION : 90°

COORDINATES: X = 1557.311
Y = 2175.351

DATE BEGINNING : Nov. 2 '83
ENDING : Nov. 14 '83

DRILLING RIG: YSO - I

OPERATOR : DARWANTO
SUPERVISOR : NAKA MATA

G.W.L.: GL - 0.40 m
(EL. 7663m)

TESTS	LUGEON TEST	
	P-Q Curve	LUGEON UNITS
ROCK CLASSIFICATION		
	CL	CM
R. Q. D. RECOVERY (%)		
DRILL WATER LOSS (%)	20	10
GEOLOGICAL DESCRIPTION	20	10
	10	0
SHAPE OF CORE	Broken	Cutting
HARDNESS	Medium hard	Soft
COLOUR	Brown/Grey	Grey
LAYER TYPE	Sand and gravel	Tuff
COLUMN SECTION		
DEPTH (m)	2.50	6.50
WATER LEVEL AND DATE	0.426 / 2-11-83	0.465 / 6-11-83
CORE BARREL	STCB	STCB / DTCB
	DTCB	
	TTCB	
CASING DURING DRILLING	Dry drilling / Water flush drilling	
DRILLING METHOD	Dry drilling	Water flush drilling

		Kg/cm ²		l/min/m									
GEOLOGICAL UNITS													
CLASSIFICATION													
		CL	CM	D	CL	CM	CL	CM	CH				
WATER LOSS (%)			20	10	20	10		0					
GEOLOGICAL DESCRIPTION		River deposits Boulder and sand mixture	Mainly medium hard rock, locally hard. Stained by iron- oxides.	6.60-18.00 m No recovery Colour of returning water is white. Put quartz-vein (thickness 1cm)	Shape of core is sand and gravel. Got by dry drilling. Including hard piece	Full recovery Rock characteristic is fresh and hard to medium hard.							
RECOVERY OF CORE			Broken	Cutting	Sand and gravel	Short column	Column	~	Club				
FIRMNESS			Medium hard	Soft	Medium hard	Hard							
COLOUR			Brown/Grey	Grey									
LITHOLOGICAL TYPE		Sand and gravel	Tuff										
LITHOLOGICAL SECTION													
DEPTH (m)		2.50	6.50	16.50	23.00	25.00	26.00	29.00	35.00				
DRILLING LEVEL AND DATE		0.26 2-11-83	0.385 3-11-83	0.462 4-11-83	0.420 5-11-83	0.465 6-11-83	0.43/0.45 7-11-83	0.48/0.49 8-11-83	0.95/0.90 9-11-83	2.21/1.49 10-11-83 2.23 11-11-83	1.45/1.62 12-11-83	1.30/1.625 13-11-83	0.64/0.43 14-11-83
RECOVERY METHOD		STCB	DTCB	STCB / DTCB				TTCB					
REMARKS DURING DRILLING		DRILLING METHOD											
DRILLING METHOD		Dry drilling	Water flush drilling	Dry drilling / Water flush drilling			Water flush drilling						

DRILLING REPORT

HOLE No. B - 40

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : QR - IV

ELEVATION OF GROUND SURFACE : 90.13 m

TOTAL LENGTH OF DRILL HOLE : 44.0 m

DIRECTION : 90°

COORDINATES: X = 1583.180
Y = 2065.094

DATE

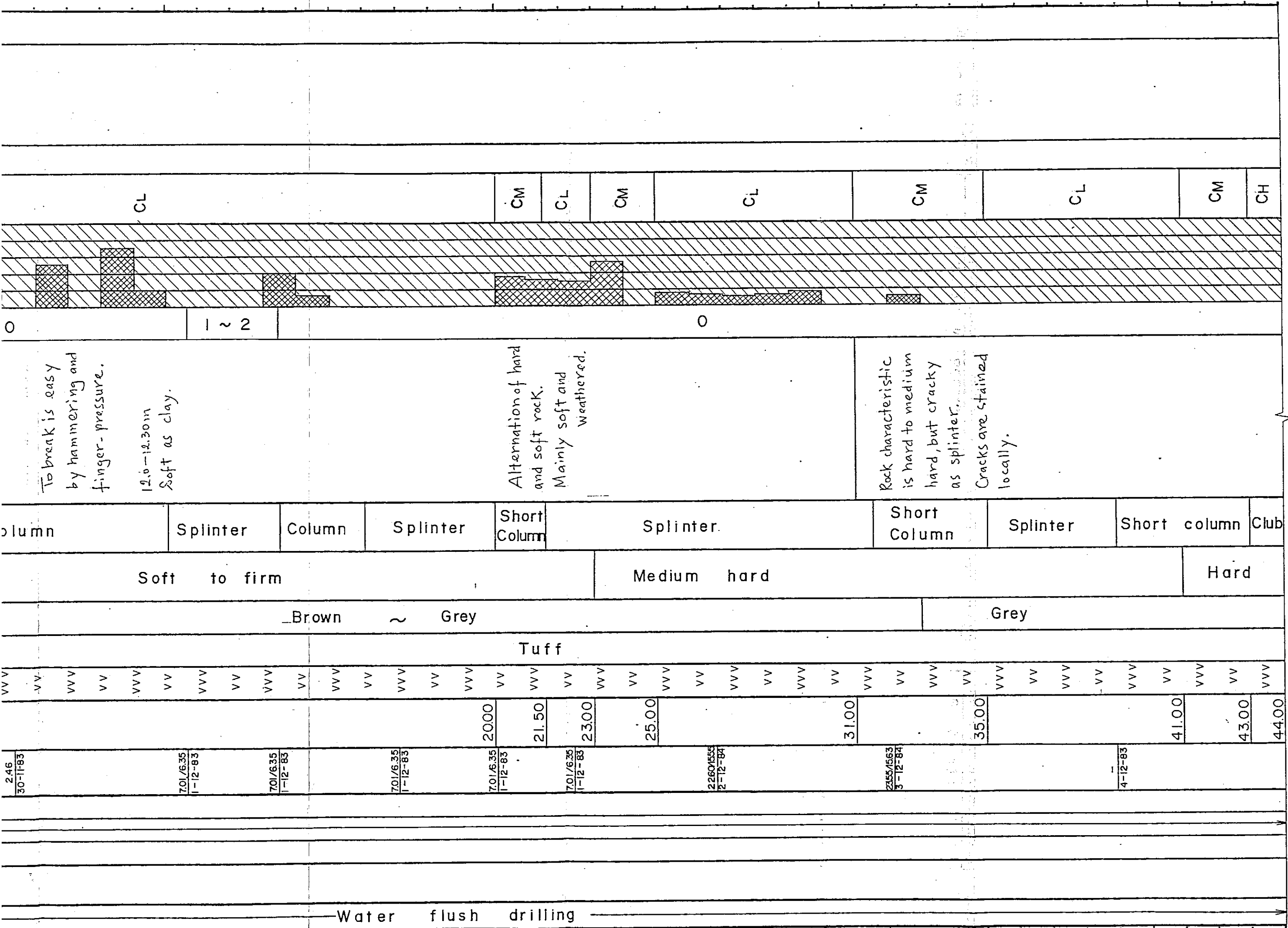
BEGINNING : Nov. 30 '83
ENDING : Dec. 4 '83

DRILLING RIG: YS 0-1

OPERATOR : DARWANTO
SUPERVISOR : NAKAMATA

G.W.L.: GL - 25.16 m
(EL. 64.97 m)

TESTS																																																																																																																	
LUGEON TEST	LUGEON UNITS																																																																																																																
ROCK CLASSIFICATION	CL CM CL CM CL																																																																																																																
R. Q. D. RECOVERY (%)																																																																																																																	
DRILL WATER LOSS (%)	0 1 ~ 2 0																																																																																																																
GEOLOGICAL DESCRIPTION	<p>Generally the rock characteristic is soft. Cracks are stained by iron oxides.</p> <p>To break is easy by hammering and finger-pressure.</p> <p>12.0 - 12.30 m Soft as clay.</p> <p>Alternation of hard and soft rock. Mainly soft and weathered.</p>																																																																																																																
SHAPE OF CORE	<table style="width: 100%; text-align: center;"> <tr> <td>Column</td> <td>Broken</td> <td>Column</td> <td>Splinter</td> <td>Column</td> <td>Splinter</td> <td>Short Column</td> <td>Splinter.</td> </tr> </table>	Column	Broken	Column	Splinter	Column	Splinter	Short Column	Splinter.																																																																																																								
Column	Broken	Column	Splinter	Column	Splinter	Short Column	Splinter.																																																																																																										
HARDNESS	Soft to firm Medium hard																																																																																																																
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DRILLING METHOD	← Water flush drilling →																																																																																																																



DRILLING REPORT

HOLE No. B - 41

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : QR - IV

ELEVATION OF GROUND SURFACE : 70.63 m

TOTAL LENGTH OF DRILL HOLE : 35.0 m

DIRECTION : 90°

COORDINATES: X = 1519.933
Y = 2016.120

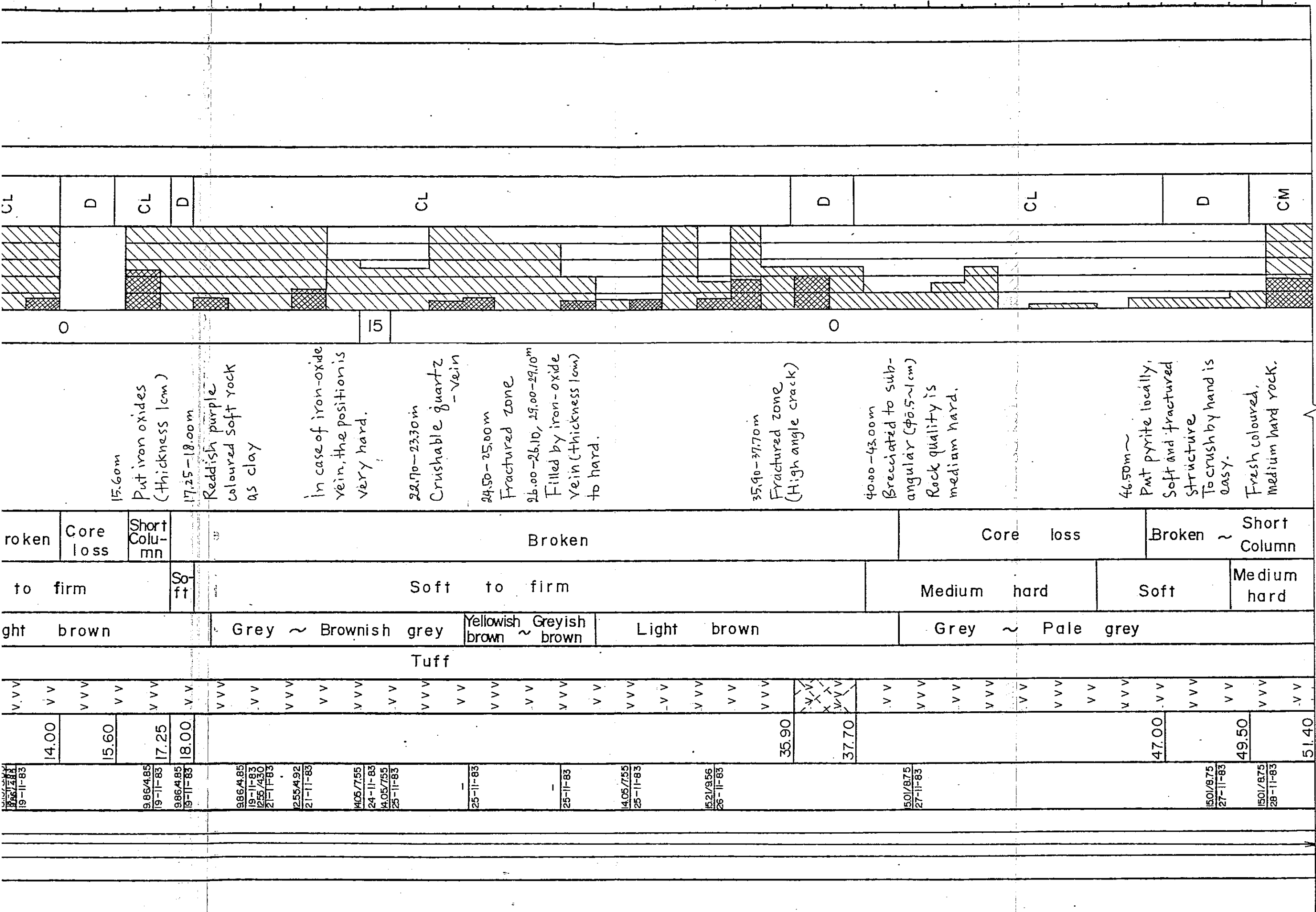
DATE : BEGINNING : Nov. 17 '83
ENDING : Nov. 22 '83

DRILLING RIG: YSO - 1

OPERATOR : DARWANTO
SUPERVISOR : NAKAMATA

G.W.L.: GL - 800 m
(EL. 62.63 m)

TESTS	
LUGEON TEST	LUGEON UNITS
ROCK CLASSIFICATION	CL
R. Q. D. RECOVERY (%)	
DRILL WATER LOSS (%)	10
DRILL WATER LOSS (%)	75
GEOLOGICAL DESCRIPTION	<p>Talus material Clayey soil including small gravel (φ 2~5mm)</p> <p>Part weathered quartz-vein.</p> <p>Shape of core is gravelly (φ 1~3cm)</p> <p>Put reddish brown coloured iron oxides.</p> <p>Mainly sub-angular gravelly core (φ 3~5cm), 10 pcs/m.</p> <p>Faces of crack are stained to brown colour.</p>
SHAPE OF CORE	Gravel ~ Short Column
HARDNESS	Medium hard
HARDNESS	Hard
HARDNESS	Medium hard
HARDNESS	H
COLOUR	Grey
LAYER TYPE	Soil
LAYER TYPE	Tuff
COLUMN SECTION	
DEPTH (m)	2.60
DEPTH (m)	25.00
DEPTH (m)	29.50
WATER LEVEL AND DATE	<p>6.30 17-11-83</p> <p>6.75 18-11-83</p> <p>6.5 19-11-83</p> <p>6.5 20-11-83</p>
CORE BARREL	<p>STCB</p> <p>DTCB</p> <p>TTCB</p>
CASING DURING DRILLING DIAMETER OF CORE	<p>←</p>
DRILLING METHOD	<p>Dry drilling</p> <p>Water flush drilling</p>



15.60m Put iron oxides (thickness 1cm)
 17.25-18.00m Reddish purple coloured soft rock as clay
 In case of iron-oxide vein, the position is very hard.
 22.70-23.30m Crushable quartz - Vein
 24.50-25.00m Fractured zone
 26.00-26.10, 29.00-29.10m Filled by iron-oxide vein (thickness 1cm) to hard.
 35.90-37.70m Fractured zone (High angle crack)
 40.00-43.00m Brecciated to sub-angular ($\phi 0.5-1$ cm) Rock quality is medium hard.
 46.50m ~ Pmt pyrite locally, Soft and fractured structure To crush by hand is easy. Fresh coloured, medium hard rock.

Broken	Core loss	Short Column	Broken	Core loss	Broken	Short Column
to firm	Soft	Soft to firm	Medium hard	Soft	Medium hard	
light brown	Grey ~ Brownish grey	Yellowish brown ~ Greyish brown	Light brown	Grey ~ Pale grey		
V.VV	VV	VV	VV	VV	VV	VV
14.00	15.60	17.25	18.00	35.90	37.70	47.00
9.86/4.85 19-11-83	9.86/4.85 19-11-83	9.86/4.85 19-11-83	9.86/4.85 19-11-83	9.86/4.85 19-11-83	9.86/4.85 19-11-83	9.86/4.85 19-11-83
14.05/7.55 24-11-83	14.05/7.55 24-11-83	14.05/7.55 24-11-83	14.05/7.55 24-11-83	14.05/7.55 24-11-83	14.05/7.55 24-11-83	14.05/7.55 24-11-83
15.21/9.56 26-11-83	15.21/9.56 26-11-83	15.21/9.56 26-11-83	15.21/9.56 26-11-83	15.21/9.56 26-11-83	15.21/9.56 26-11-83	15.21/9.56 26-11-83
15.01/8.75 27-11-83	15.01/8.75 27-11-83	15.01/8.75 27-11-83	15.01/8.75 27-11-83	15.01/8.75 27-11-83	15.01/8.75 27-11-83	15.01/8.75 27-11-83
15.01/8.75 28-11-83	15.01/8.75 28-11-83	15.01/8.75 28-11-83	15.01/8.75 28-11-83	15.01/8.75 28-11-83	15.01/8.75 28-11-83	15.01/8.75 28-11-83

Water flush drierling

DRILLING REPORT

HOLE No. B-43

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : QR - I

ELEVATION OF GROUND SURFACE : 64.80 m

TOTAL LENGTH OF DRILL HOLE : 19.8 m

DIRECTION : 90°

COORDINATES: X = —
Y = —

DATE
BEGINNING: 6 Dec. '83
ENDING : 17 Dec. '83

DRILLING RIG: YSO - I

OPERATOR : ANTON / DARWANTO
SUPERVISOR : NAKAMATA

G.W.L.: GL+0.1 m
(EL. 64.90 m)

TESTS		LUGEON TEST	
		P-Q Curve	
		Kg/cm ²	l/min/m
		LUGEON UNITS	
ROCK CLASSIFICATION		CL	CM
R. Q. D. RECOVERY (%)		CL	CM
DRILL WATER LOSS (%)		0	
GEOLOGICAL DESCRIPTION		<p>Fine sand. Put some organic materials. Rock quality is hard but to destroy by hammer is easy. 2.50-3.00m Partially very hard. Generally the rock characteristic is porous and soft as pumice.</p> <p>Shape of core is columnar, but easy to break by hammer.</p> <p>13.00-15.00m Characteristic of rock is fragile Medium hard to hard Cracks are stained by iron oxides.</p>	
SHAPE OF CORE		Column	Splinter Broken Short Column ~ Club Club ~ Column
HARDNESS		Medium hard.	
COLOUR		Brownish grey ~ Brown ~ Gorey.	
LAYER TYPE		Soil Sand stone	
COLUMN SECTION		[Patterned representation of column section]	
DEPTH (m)		0.34	3.50
WATER LEVEL AND DATE		0.00 7-12-83	0.00 9.00 11-12-83 12-12-83
CORE BARREL		STCB DTCB TTCB	
CASING DURING DRILLING DIAMETER OF CORE		0.50	
DRILLING METHOD		Water flush drilling	

DRILLING REPORT

HOLE No. B-44

PROJECT : KOTAPANJANG HYDRO-ELECTRIC POWER DEVELOPMENT PROJECT

LOCATION : QR - I

ELEVATION OF GROUND SURFACE : 64.41 m

TOTAL LENGTH OF DRILL HOLE : 20.0 m

DIRECTION : 90°

COORDINATES: X = — Y = —

DATE : BEGINNING : 2 Jan. '84
ENDING : 6 Jan. '84

DRILLING RIG: YSO - I

OPERATOR : DARWANTO / SUNARIO
SUPERVISOR : IMAM S.

G.W.L.:

TESTS			
LUGEON TEST	P-Q Curve		
LUGEON UNITS			
ROCK CLASSIFICATION		D	CL
R. Q. D. RECOVERY (%)			
DRILL WATER LOSS (%)		10	100
GEOLOGICAL DESCRIPTION		<p>Top soil Silty materials.</p> <p>Hard, but poor recovery. 5.00-6.00m Core loss 6.00m ~ Shape of core is sandy by dry drilling.</p> <p>Cracks (mainly high angle) are stained to brown colour. Partially dark brown.</p> <p>13.00-16.50m Rock characteristic is hard, but put many high angle joints (stained to dark brown) Locally put weak zone (to damage is easy by finger-pressing) 17.00-20.00m To break by hammer is easy.</p>	
SHAPE OF CORE		Short Column	Sand and gravel
HARDNESS		Hard	
COLOUR		Reddish brown	Light greenish brown
LAYER TYPE		Soil	Sand stone
COLUMN SECTION			
DEPTH (m)		4.00	9.00
WATER LEVEL AND DATE		2.15 4-1-84	9.65 6-1-84
CORE BARREL	STCB	←————→	
	DTCB	←————→	
	TTCB	←————→	
CASING DURING DRILLING DIAMETER OF CORE			
DRILLING METHOD		Dry drilling	Water flush drilling