

GEOLOGICAL DATA

1. DRILLING LOGS

PROJECT		GEOLOGICAL AND MATERIAL INVESTIGATION				DEPTH		ELEVATION	
SITE		PROPOSED DABONG SITE				INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE		FROM TO		DRILLED		LOGGED	
DAILY PROGRESS	DEPTH (M)	REDUCED LEVEL (M)	WATER LEVEL (M)	DESCRIPTION	GRAPHIC LOG	WEATHERING GRADE	RQD (%)	CRR (%)	LUGEON TEST
	1	1.20		Weak to very weak, reddish to yellow, highly weathered QUARTZ MICA SCHIST.		IV			
	2			Pale greenish grey QUARTZ MICA SCHIST with dark greenish grey irregular bands (of biotite?) parallel to foliation dipping at 60 degrees. Trace of pyrite. Joints dip at 70 degrees and are generally fresh and have rough surfaces. Voids in rock less than 1% and show no signs of weathering.		II			
	3								
	4								
	5	5.00							
	6			This section is basically similar to the above but have weathered in part to pale red. Fresh rock/weathered rock = 75% approximately.		III			
	7								
	8		8.90						
	9								
	10	10.00							
	11			Pale greenish grey QUARTZ MICA SCHIST similar to section from 1.2 to 5.0 m.		II			
	12								
	13								
	14								
	15	15.00							
	16			Pale greenish grey QUARTZ MICA SCHIST with dark irregular streaks of biotite (?) usually 1 to 2 mm thick. All joints have strong iron stains and some surfaces are coated with clay. Those parallel to foliation, which dip at 60 degrees, are slickensided. Joints at 23.3 and 23.4 m depth cross cut foliation at 20 degree while another fracture at 23.51 m dips at 45 degrees. Intact rock is very strong with apparent abundance of quartz.		II			
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25	25.00							
	26			Light greenish to dark grey QUARTZ MICA SCHIST with calcite (replacing quartz?). Darker mineral forms thin streaks dipping at 40 degrees, and pyrite as randomly distributed trace mineral. Joints and quartz veins both parallel to foliation are undulating. Rock is fresh except for slight yellow colouration along some foliation and a particular patch on one side of the core from 33.03 to 33.13 m, probably part of a clast in the original rock.		I			
	27								
	28								
	29								
	30	30.00							

RQD (Rock Quality Designation) = (Total length of cores longer than 10cm)/1m x 100%
 CRR (Core Recovery Ratio) = (Length of cores recovered)/(core run) x 100%

PROJECT		GEOLOGICAL AND MATERIAL INVESTIGATION				DEPTH	ELEVATION		
SITE		PROPOSED DABONG DAN SITE				INCLINATION	DRILL RIG		
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED			
DAILY PROGRESS	DEPTH (M)	REDUCED LEVEL (M)	WATER LEVEL (M)	DESCRIPTION	GRAPHIC LOG	WEATHERING GRADE	RQD (%)	CRR (%)	LUGEON TEST
	31			-ditto-					
	32								
	33								
	34								
	35								
	36								
	37								
	38								
	39								
	40			END OF BOREHOLE					

RQD (Rock Quality Designation) = (Total length of cores longer than 10cm)/1m x 100%
 CRR (Core Recovery Ratio) = (Length of cores recovered)/(core run) x 100%

PROJECT		GEOLOGICAL AND MATERIAL INVESTIGATION				DEPTH	ELEVATION		
SITE		PROPOSED DABONG DAM SITE				INCLINATION	DRILL RIG		
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED			
DAILY PROGRESS	DEPTH (M)	REDUCED LEVEL (M)	WATER LEVEL (M)	DESCRIPTION	GRAPHIC LOG	WEATHERING GRADE	RQD (%)	CRR (%)	LUGEON TEST
	1			Completely weathered pale pink, light to dark brown, and yellow SCHIST with fabric visible in corestones. Occasional quartz veins.					
	2								
	3			QUARTZ MICA SCHIST strongly weathered to very pale yellow with mica to deep red. Iron stains extends up to 2 cm from fractures. Joint surfaces often coated thinly with clay. Residual metamorphic foliation dips at about 70 degrees.					
	4								
	5								
	6		2.2 CM	Pale greenish grey QUARTZ MICA SCHIST weathered deep red and yellow along joints parallel to foliation. Weathered rock/fresh rock = 50 %					
	7								
	8								
	9								
	10								
	11								
	12								
	13			Pale greenish grey QUARTZ MICA SCHIST with trace of pyrite. Joints are parallel to foliation, slickensided, and sometimes iron stained. Fractures cross cutting foliation are strongly stained. Foliation dip increases from about 40 degrees at the top to about 60 degrees at the bottom of section.					
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24			Pale to medium grey QUARTZ MICA SCHIST with dark coloured mineral forming streaks. Probably calcareous. Schistosity is less pronounced and in some sections virtually absent. Transition from quartz mica schist above are transitional. Quartz veins are irregular, 1 to 4 mm thick, vertical to steeply dipping and merge into ground mass with diffuse contacts. Weathering is confined to joints cross cutting the foliation at about 45 degrees dip.					
	25								
	26								
	27								
	28			QUARTZ MICA SCHIST as above but with no sign of weathering. A concentration of pale yellow clasts from 38.0 to 38.8 m, each less than 2 cm across and elongated parallel to the fabric is probably a primary texture.					
	29								
	30								


RQD (Rock Quality Designation) = (Total length of cores longer than 10cm)/1m x 100%
 CRR (Core Recovery Ratio) = (Length of cores recovered)/(core run) x 100%

PROJECT		GEOLOGICAL AND MATERIAL INVESTIGATION				DEPTH	ELEVATION		
SITE		DABONG DAM SITE				INCLINATION	DRILL RIG		
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED			
DAILY PROGRESS	DEPTH (M)	REDUCED LEVEL (M)	WATER LEVEL (M)	DESCRIPTION	GRAPHIC LOG	WEATHERING GRADE	RQD (%)	CRR (%)	LUGLON TEST
	31			-DITTO-					
	32								
	33								
	34								
	35								
	36								
	37								
	38								
	39								
	40			END OF BOREHOLE					

RQD (Rock Quality Designation) = (Total length of cores longer than 10cm)/1m x 100%
 CRR (Core Recovery Ratio) = (Length of cores recovered)/(core run) x 100%

SUMMARY OF DRILL LOG

HOLE NO. K-1 (Kemubu Dam)

DEPTH	ELEVATION	CLASS THICKNESS	COLUMN SECTION	ROCK TYPE OR FORMATION	DESCRIPTION	G. W. L.	CORE RECOVERY	R. Q. D.	WATER PRESSURE TEST (LUGEON VALUE)												
									50	50	10	20	30	40	50						
0.5				Top Soil	Top Soil 50 cm																
2		CL		Weathered Schist	0 - 5.5 Weathered Schist Loose and weak. Iron stained.																
4		3.8																			
5.5		CM		Schist	5.5 - 40.0 Schist Quartz-Mica Schist Calcite vein in some places. High dip schistosity (75° to 85°) Fairly hard and tight. Crack interval 30 to 50 cm. Up to 21.0 m, iron stained in crack.																
6		5.5																			
8																					
10																					
2																					
4		CM																			
6																					
8																					
20		21.0																			
2																					
4																					
6		CH																			
8																					
30		31.0																			
2																					
4		CM																			
6		to																			
8		CH																			
40		40.0																			

GOVERNMENT OF MALAYSIA
STUDY
ON
KELANTAN RIVER BASIN - WIDE FLOOD MITIGATION
JAPAN INTERNATIONAL COOPERATION AGENCY

SUMMARY OF DRILL LOG

DEPTH	PERCENTAGE	CLASSIFICATION	COLUMN SECTION	ROCK TYPE OR FORMATION	DESCRIPTION	G. W. L.	CORE RECOVERY	R. Q. D.	WATER PRESSURE TEST				
									LU'GEON VALUE				
									10	20	30	40	50
0 - 13.6				Weathered Schist	Weathered schist Loose and weak, Cracky condition Iron stained.								
2													
4		CL											
6	6.5	6.5											
8													
10		CM											
12.8 - 13.4					Fractured zone.								
13.6	13.6	13.6											
13.6 - 40.0				Schist	Schist. Muddy origin, mica bearing quartz-schist								
2													
4													
6		CM											
8													
20.0	20.0	20.0			Calcite and chlorite in some places.								
2					High dip schistosity (75° to 85°).								
4					Generally hard and tight.								
6					Crack interval 30 to 50 cm.								
8					Locally open crack and fractured.								
30		CH											
19.4					Fractured								
2					Below 25 m								
4					Very sound rock.								
40	40.0	40.0											

2. TEST-PITTING LOGS

Location : 2 km upstream of Dabong Dam site

Date : 31/10/1988

Test - Pit No : D.TP - 1

Method of Excavation : Man power

Depth to Water Level : Not reached

m Logged by :

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING		
			SAMPLE NO.	DEPTH (m)	
0m		0 - 0.75 m SAND Fine to medium, with grass roots and wood fragments; loose, dry, yellowish - brown.			
0.75m		0.75 - 0.85 m CLAY With organic matter; soft, moist, yellowish - grey.			
0.85m					
1.0m					
1.20m		0.85 - 1.20 m SAND Fine to medium, with large amount of organic matter and wood fragments; dry, yellowish - brown.			
1.60m					
1.80m		1.20 - 1.60 m SAND Fine to medium, with small amount of grass roots, dry, yellowish - brown.			
2.0m					
			1.60 - 1.80 m CLAY Medium plasticity, soft, moist, yellowish - brown.	SA - 1	2.5m
3.0m			1.80 - 3.0 m SAND Medium, well - sorted with some wood fragments; dry, scattered gravel to 3 mm maximum size.		
		Between 1.8 and 2.0 m thin layers of clay			

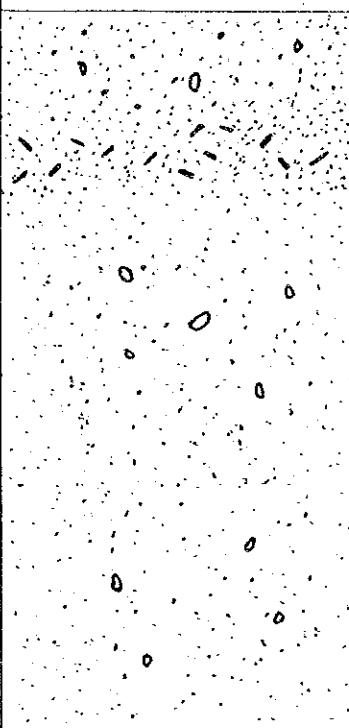
REMARKS : Ground - surface covered with grass

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 ON
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Location : 2 Km upstream of Dabong Dam site Date : 31/10/1988

Test - Pit No : D.TP - 1 Method of Excavation : Man power

Depth to Water Level : Not reached m. Logged by : _____

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING	
			SAMPLE NO.	DEPTH (m)
0m		0 - 2.00m <u>SAND</u> Medium, with many mica flakes scattered gravel up to 3 cm maximal size, well-sorted, dry, yellowish - brown	SA - 2	0.75m
0.3m 0.5m		0.30 - 0.50 m Containing approximately 10% wood fragments by volume.		
1.0m				
2.0m				

REMARKS: 5m in distance between D.TP-1 and D.TP-1
Ground - surface uncovered by plants

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Location : 7 km upstream of Dabong Damsite

Date : 31/10/1988

Test - Pit No : D.TP - 2

Method of Excavation : Man power

Depth to Water Level : -1.8 m

Logged by :

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING	
			SAMPLE NO.	DEPTH (m)
0m		<p>0 - 1.20 m SAND AND GRAVEL Medium to coarse sand and gravel, with scattered cobbles to 15cm maximum size, almost rounded but some subrounded; cobbles consist mainly of quartz, slate and schist; dry, loose, greyish-brown. very thin layers of clay around 0.9m in depth, some amount of grass root above the 0.5m depth level.</p>	SA-3	0.65m
1.2m			<p>1.20 - 1.90 m SAND Medium to coarse with gravel about 10% by volume about up to 3cm max. size. Containing many mica flakes, dry except below water level. well - sorted, greyish-brown.</p>	SA-4
1.9m				

REMARKS : River - bar deposit.

Ground surface uncovered by plants. At the pitting site, sand is very loose causing difficulty in pitting.

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Location : 7 km upstream of Dabong Dam site

Date : 31/10/1988

Test - Pit No : D.TP - 3

Method of Excavation : Man power

Depth to Water Level : Not reached m Logged by :

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING	
			SAMPLE NO.	DEPTH (m)
0 m		0 - 0.20 m SAND Fine to medium, with grass roots and wood fragments, loose, moist yellowish - brown.		
0.20		0.20 - 0.30 m SILT With organic matter; soft, moist, yellowish - grey.		
0.30		0.30 - 3.0 m SAND Fine to medium, about 70% and 30% medium sand, contain many quartz particles and mica flakes, well - sorted, with rare thin lenses of clay, dry, yellowish - brown	SA - 5	2.0 m
1.0 m		0.3 - 0.7 m Containing some wood fragment.		
2.0 m				
3.0 m				

REMARKS : River - bar deposit
Ground - surface covered with grass:

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ON
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Location : 2 downstream of Kemubu Damsite Date : 1/11/1988

Test - Pit No : K.TP - 1 Method of Excavation : Man power

Depth to Water Level : Not reached m Logged by : _____

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING	
			SAMPLE NO.	DEPTH (m)
0m		0 - 0.30 m <u>SAND</u> Fine to medium, with large amount of organic matter and some grass roots, slightly moist, brownish - black.		
0.30m		0.3 - 0.55 m <u>SAND</u> Fine, well - sorted, loose, dry, yellowish - brown		
0.55m		0.55 - 2.00m <u>SAND</u> About 20 % fine sand, 70% medium sand, 10% coarse sand, sporadically with some wood fragments, well - sorted, loose, dry, yellowish - brown.	SA - 6	1.0 m
1.0m				
2.0m				
2.5m			SA - 7	2.5 m

REMARKS : Ground - surface covered with grass
 At the pitting site, sand is loose causing difficulty in pitting

GOVERNMENT OF MALAYSIA
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 KELANTAN RIVER BASIN - WIDE FLOOD MITIGATION
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Location : 1 km upstream of Kemubu Damsite Date : 1/11/1988

Test - Pit No : K.TP - 2 Method of Excavation : Man power

Depth to Water Level : - 2.5 m Logged by :

DEPTH (METER)	GRAPHIC LOG	CLASSIFICATION AND DESCRIPTION OF MATERIAL	SAMPLES FOR TESTING	
			SAMPLE NO.	DEPTH (m)
0 m		0 - 0.30 m SAND Medium, with gravel about 10% to 20% by volume, up to 4 cm maximum size.		
0.30 m		0.3 - 1.20 m SAND Fine to medium, scattered, rounded gravel 2 to 3 cm in diameter, contains some decayed wood fragments between 0.3 m and 0.6 m in depth, well-sorted, loose, dry, yellowish-brown.	SA - 8	0.8 m
1.0 m		1.20 - 2.50 m SAND AND GRAVEL About 60 % sand mainly medium to coarse and 40 % gravel together with cobbles by volume; cobbles consist mainly of quartzite, meta-sand stones and chert, up to 15 cm maximum size; well-graded, dry except around water-table. Greyish-brown.	SA - 9	2.0 m
1.20 m				
2.0 m				
2.5 m				

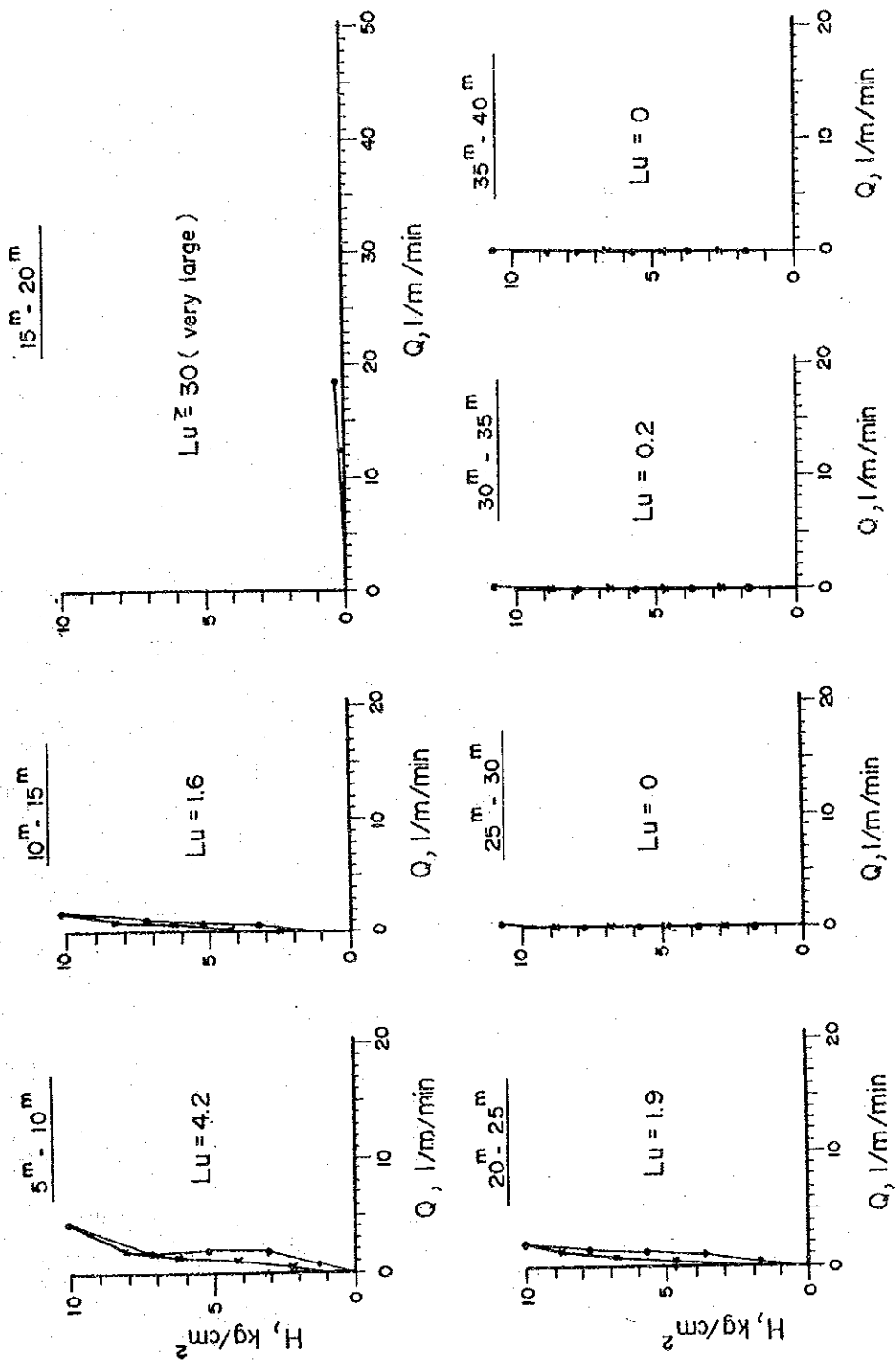
REMARKS : River - bar deposited.
Due to the presence of water, pitting is very hard below the 2.5 m depth level.

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3. P-Q CURVE OF LUGEON TEST

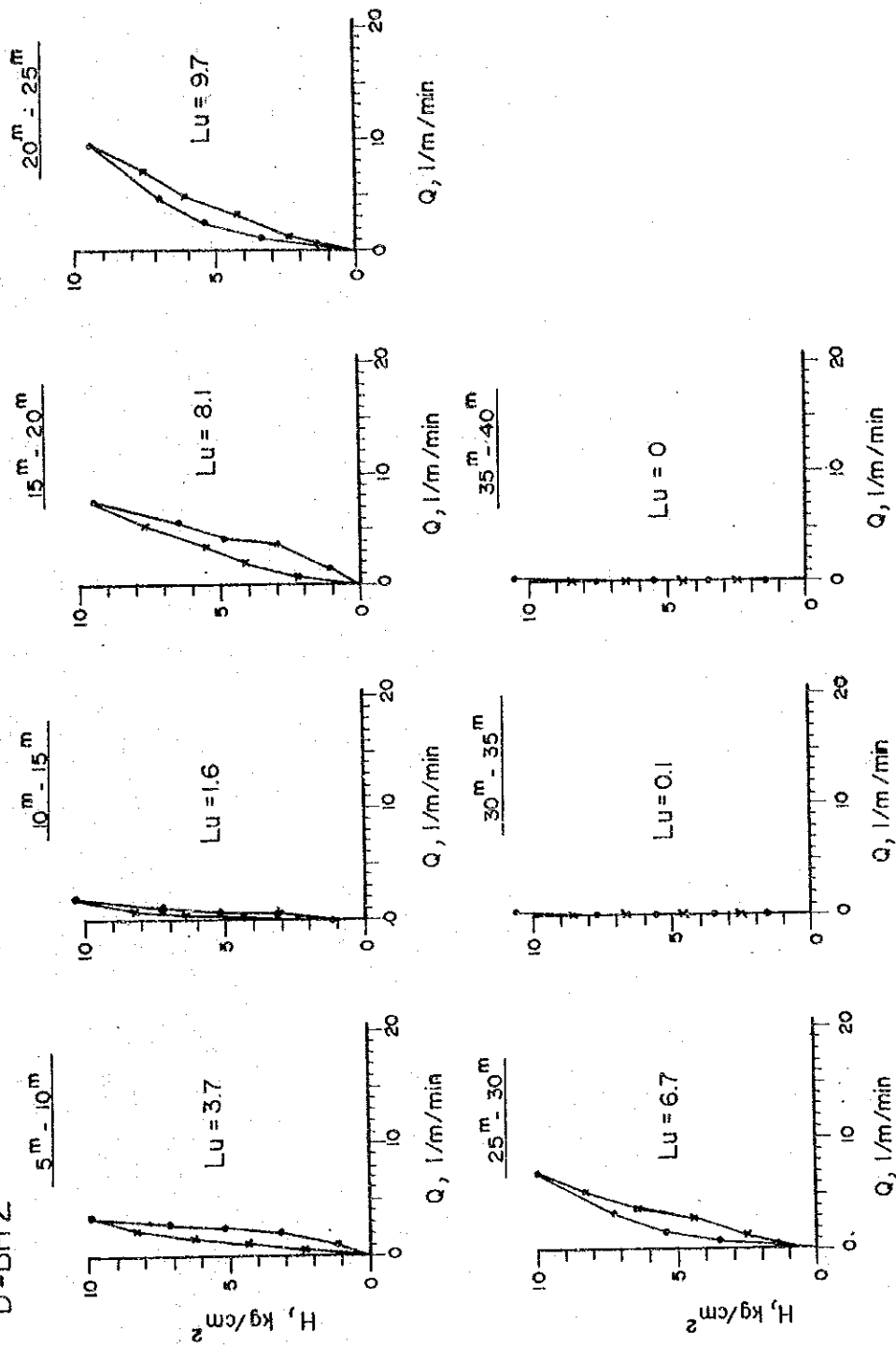
P-Q Curve of D-BH1

D-BH1



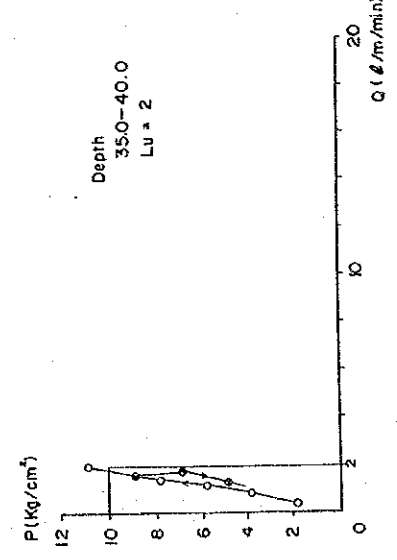
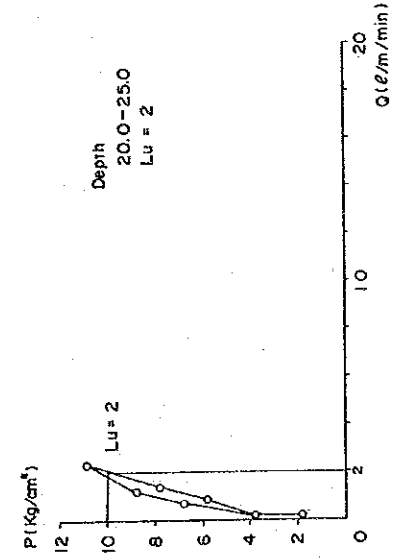
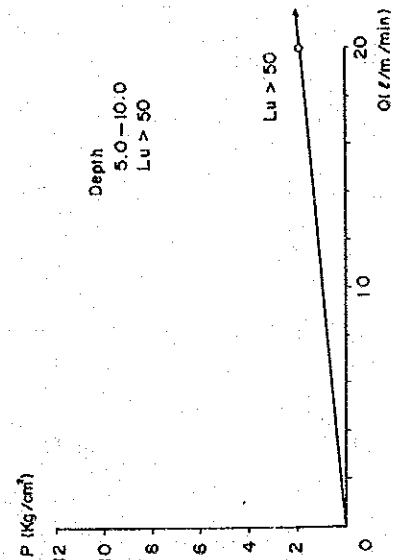
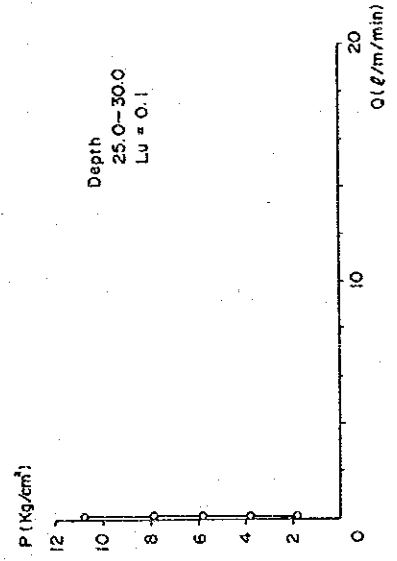
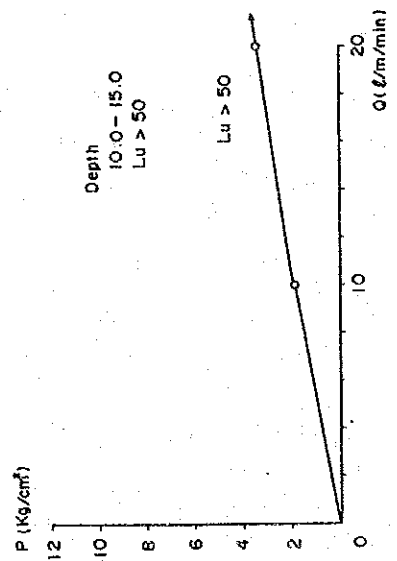
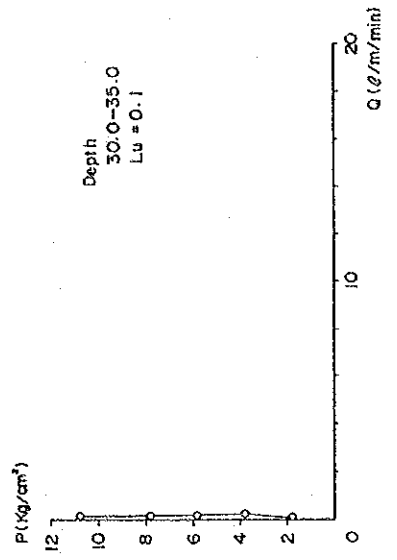
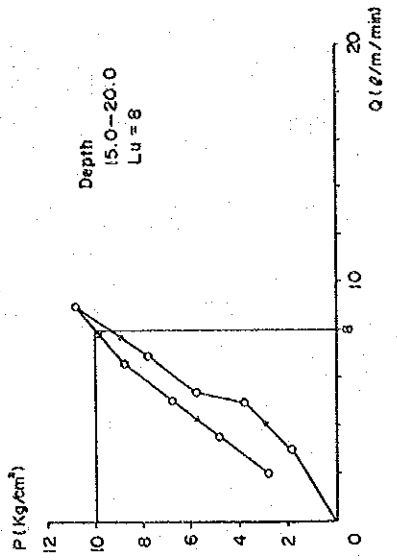
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D-BH2



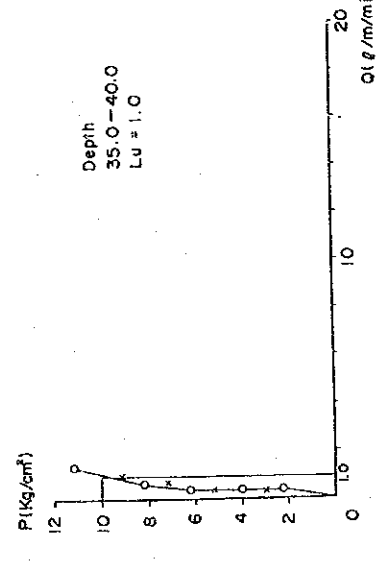
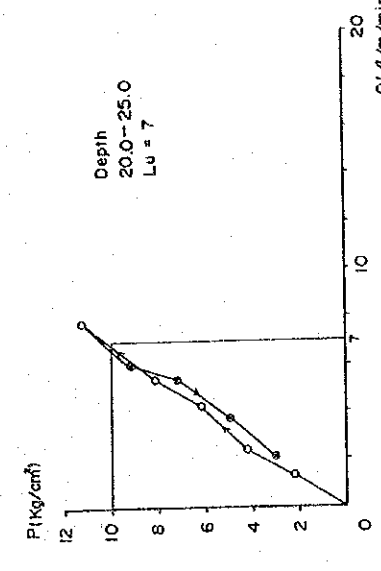
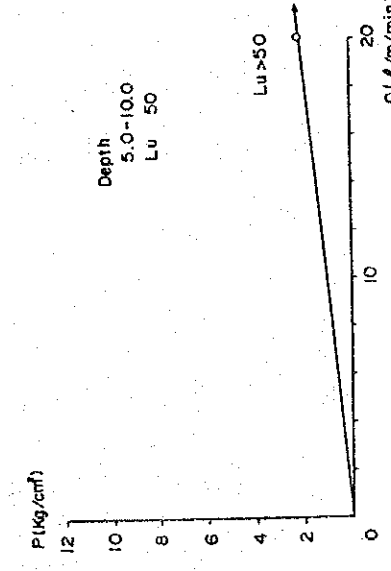
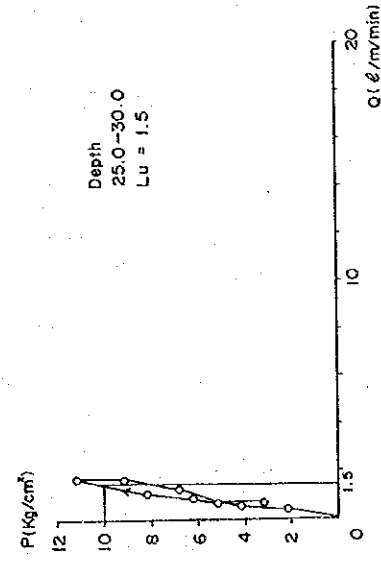
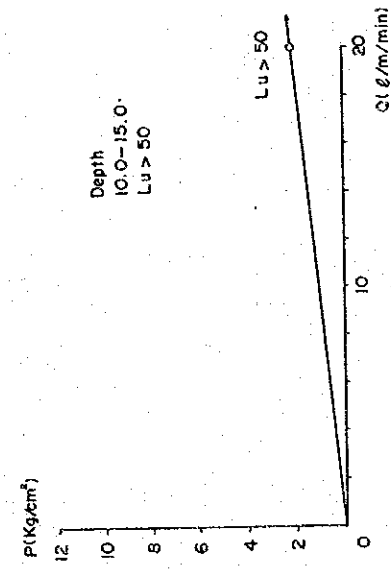
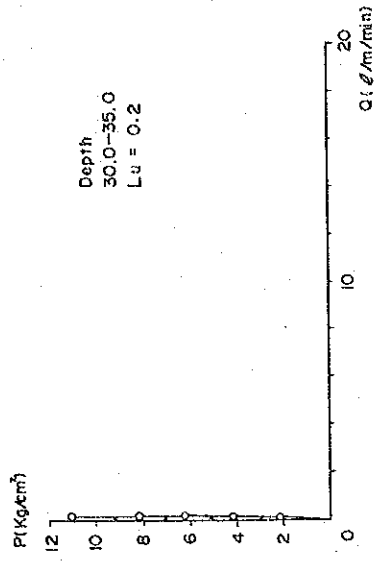
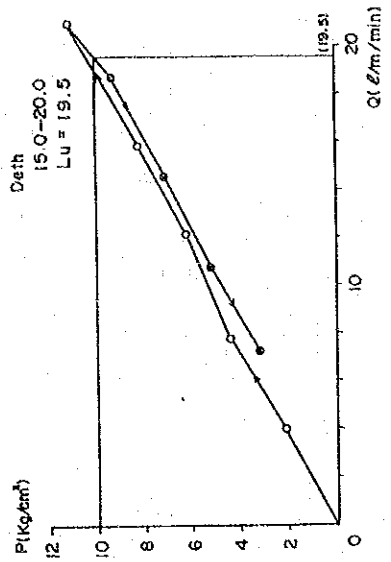
P-Q Curve of D-BH2

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P-Q Curve of K-1

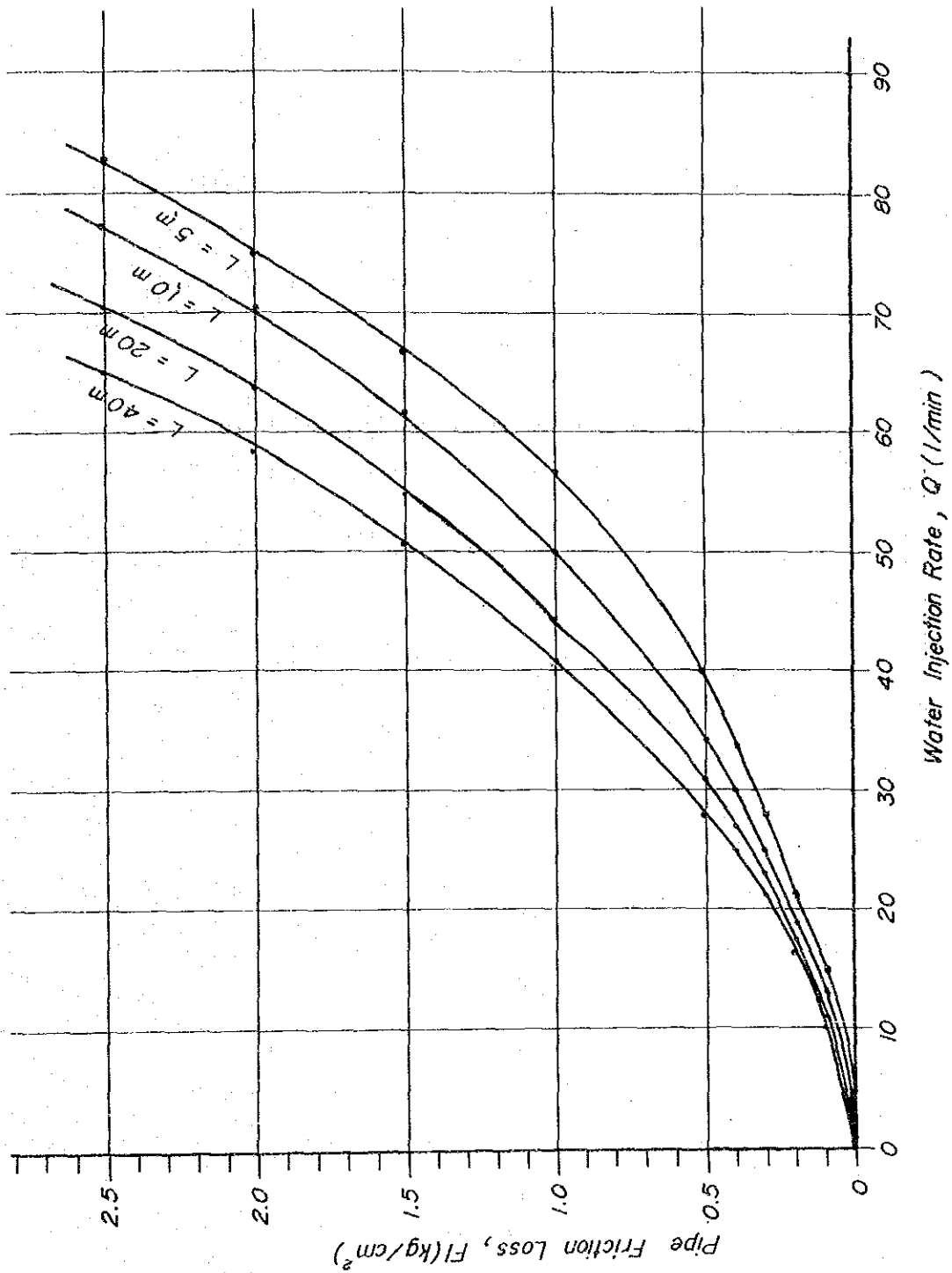
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P-Q Curve of K-2

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4. FRICTION LOSS TEST RESULT

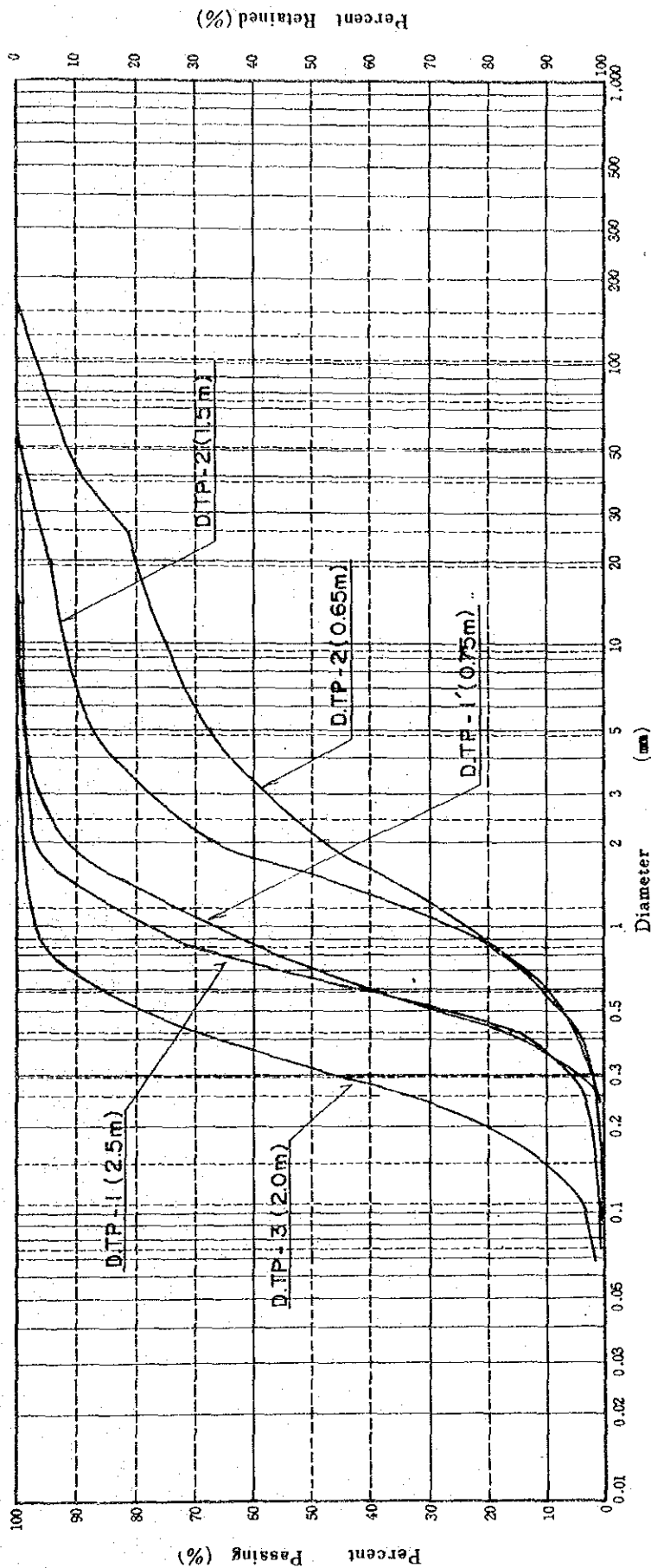


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5. GRADATION ANALYSIS RESULT OF TEST-PIT SAMPLES

Test - pits for Dabong Dam site

Sieve & Screen	74 μ	105 μ	149 μ	200	250 μ	297 μ	420 μ	590 μ	840 μ	1.19 μ	2.0 μ	2.38 μ	4.76 μ	9.52 μ	19.1 μ	25.4 μ	38.1 μ	50.8 μ	76.2 μ	101.6 μ	127.152 μ		
	#200	#100	#60	#50	#40	#30	#20	#16	#10	#8	#4	#4	#4	3/8"	1/2"	1"	1 1/2"	2"	3"	4"	5"	6"	8"



Clay to Silt (Fines)	Sand		Gravel		Cobbles	Boulders
	fine	medium	coarse	coarse		

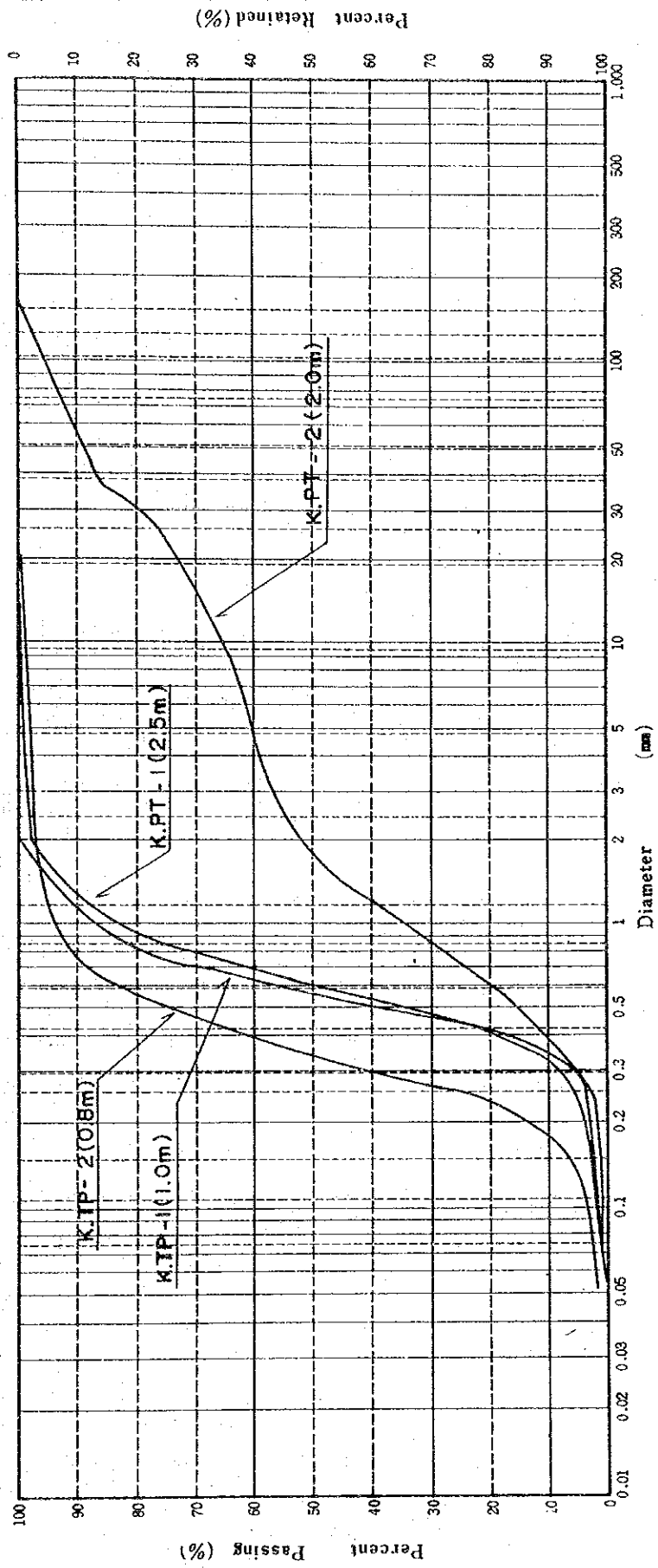
Gradation Curves of Test - pits for Dabong Dam.

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Test - pits for Kemubu Dam site

Gradation Curves of Test - pits
for Kemubu Dam

Sieve & Screen	74 μ	105 μ	149 μ	200	#100	#60	#50	#40	#30	#20	#16	#10	#8	#4	3/4"	1"	1 1/2"	2"	3"	4"	5"	6"	8"	
	250	425	590	840	1.19	2.0	2.38	4.76	9.52	19.1	25.4	38.1	50.8	76.2	101.6	127	152							



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