



# DRILL LOG

HOLE NO. BP-03 SHEET NO. 1 OF 2

PROJECT		MATUNG RIVER DEVELOPMENT PROJECT				DEPTH	60.0 m	ELEVATION	457 mt			
SITE		POWER STATION SITE		COORDINATE	:	INCLINATION		DRILL RIG	Long Year 34			
AVERAGE CORE RECOVERY		DATE		FROM 14, Dec. '82 TO 27, Jan. '83	DRILLED	Salv. Laborinto	LOGGED					
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST LOG ON VALUE N-value	DEPTH	
1982	1		Over-burden Silty clay with pebbles and fragments		Reddish and yellowish brown Silty clay						1	
	2											2
	3											3
	4											4
	5											5
	6											6
	7											7
	8											8
	9					Yellowish brown Clayey silt						9
	10											10
	11											11
	12					Hard yellowish brown Clayey silt with pebbles						12
	13										13	
	14										14	
	15										15	
	16										16	
	17				Greyish brown highly weathered Basalt						17	
	18										18	
	19										19	
	20		Andesite		Light gray highly fractured Basalt water-stained, highly shattered						20	
	21				Pyrite dissemination along fractured zone							21
	22				ditto							22
	23				No core sample obtained return water: grayish							23
	24											24
	25					Light gray, highly weathered Andesite with pyrite dissem.						25
	26											26
1983	27										27	
	28										28	
	29										29	
	30										30	

HOLE NO. BP-03

\* R Q D is Rock Quality Designation. R Q D = (Total length of cylindrical cores longer than 10 cm) / (Total core length) x 100%  
 \* LOG ON VALUE is 1 m at under injection water pressure of 10 kg/cm<sup>2</sup>  
 \* DEPTH and ELEVATION are in meter  
 \* DIAMETER is in millimeter

NIPPON KOEI CO., LTD.  
CONSULTING ENGINEERS, TOKYO

# DRILL LOG

HOLE NO BP-03

SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY		R Q D	WATER PRESSURE TEST LOGEON VALUE N-value				DEPTH
								RECOVERY	RECOVERY		1	2	3	4	
8 Jan 1983	30			✓ ✓	Light grey highly weathered Andesite with pyrite dissemination			S-13							30
11 Jan	31			✓ ✓ ✓				S-14							31
	32			✓ ✓ ✓	ditto			S-15							32
	33			✓ ✓ ✓				S-16							33
	34			✓ ✓ ✓				S-17							34
	35			✓ ✓ ✓				S-18							35
	36			✓ ✓ ✓				S-19							36
	37			✓ ✓ ✓	Light grey, highly weathered Andesite highly to moderately weathered.			S-20							37
	38			✓ ✓ ✓				C-7							38
	39			✓ ✓ ✓				C-8							39
	40			✓ ✓ ✓	Light grey highly fractured Andesite			C-9							40
	41			✓ ✓ ✓				C-10							41
	42			✓ ✓ ✓	Light grey highly fractured Andesite			C-11							42
	43			✓ ✓ ✓				C-12							43
	44			✓ ✓ ✓	ditto, with pyrite dissemination			C-13							44
	45			✓ ✓ ✓				C-14							45
	46			✓ ✓ ✓				C-15							46
	47			✓ ✓ ✓	Light grey highly fractured Andesite with pyrite dissemination			C-16							47
	48			✓ ✓ ✓				C-17							48
	49			✓ ✓ ✓				C-18							49
	50			✓ ✓ ✓				C-19							50
	51			✓ ✓ ✓				C-20							51
	52			✓ ✓ ✓	ditto			C-21							52
	53			✓ ✓ ✓				C-22							53
	54			✓ ✓ ✓				C-23							54
	55			✓ ✓ ✓				C-24							55
	56			✓ ✓ ✓	ditto			C-25							56
	57			✓ ✓ ✓				C-26							57
	58			✓ ✓ ✓				C-27							58
	59			✓ ✓ ✓				C-28							59
	60			✓ ✓ ✓				C-29							60

HOLE NO. BP-03

LOG FORM ( )

# DRILL LOG

HOLE NO. BP-04 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	80 m	ELEVATION	310 mt			
SITE		POWER STATION SITE		COORDINATE		DECLINATION		DRILL RIG	Long Year 34			
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	Salv. Labeinto	LOGGED					
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST LUGFON VALUE	DEPTH	
3. Feb. 1983	1		Sandy clay	--- --	Brown clayey silt		C-1				1	
	2		Weathered Andesite	∇ ∇ ∇	Light grey, highly weathered Andesite		C-2				2	
4. Feb	3		Brown Clay	--- --	Highly and moderately weathered Andesite		C-3				3	
	4			--- --	Brown Silty Clay and light grey highly weathered Andesite		C-4				4	
	5		Light grey Andesite, weathered	∇ ∇ ∇	Brown Silty Clay and light grey highly weathered Andesite		C-5				5	
6		∇ ∇ ∇		Light grey Andesite		C-6				6		
7		∇ ∇ ∇		Light grey Andesite		C-7					7	
5. Feb	8		Water-strained	∇ ∇ ∇			C-8				8	
	9			∇ ∇ ∇			C-9				9	
	10			∇ ∇ ∇	Light grey Andesite		C-10				10	
	11			∇ ∇ ∇			C-11				11	
6. Feb	12		highly-weathered jointed	∇ ∇ ∇			C-12				12	
	13			∇ ∇ ∇			C-13				13	
	14			∇ ∇ ∇			C-14				14	
	15			∇ ∇ ∇			C-15				15	
	16			∇ ∇ ∇			C-16				16	
	17			∇ ∇ ∇	Light grey Andesite		C-17					17
9. Feb	18		highly-weathered jointed	∇ ∇ ∇			C-18				18	
	19			∇ ∇ ∇			C-19				19	
	20			∇ ∇ ∇			C-20				20	
	21			∇ ∇ ∇			C-21				21	
	22			∇ ∇ ∇			C-22				22	
	23			∇ ∇ ∇			C-23				23	
	24			∇ ∇ ∇			C-24				24	
	25			∇ ∇ ∇	Light grey Andesite		C-25					25
	26			∇ ∇ ∇			C-26				26	
	27			∇ ∇ ∇			C-27				27	
	28			∇ ∇ ∇			C-28				28	
	29			∇ ∇ ∇			C-29				29	
	30			∇ ∇ ∇			C-30				30	

HOLE NO. BP-04

\*R Q D is Rock Quality Designation. R Q D = (Total length of cylindrical cores longer than 10 cm / Total core length) x 100%  
 \*LUGFON VALUE is 1 mm in under injection water pressure of 10 kg/cm<sup>2</sup>  
 \*DEPTH and ELEVATION are in meter  
 \*DIAMETER is in millimeter

NIPPON KOEI CO., LTD.  
CONSULTING ENGINEERS, TOKYO

# DRILL LOG

HOLE NO. BP-04 SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORRECTION		R Q D	WATER PRESSURE TEST					DEPTH						
								75	78		LOGON VALUE											
10. Feb	31		Rather fresh Andesite	✓ ✓	Light grey Andesite			C-31														
	32			✓ ✓		C-32																
	33			✓ ✓		C-33																
	34			✓ ✓		C-34																
	35	35		✓ ✓		C-35																
	36			✓ ✓		C-36																
	37			✓ ✓		C-37																
	38			✓ ✓		C-38																
	39			✓ ✓		C-39																
	40	40				Andesite slightly weathered, vesicular water-stained	✓ ✓	Light grey Andesite			C-40											
41		✓ ✓	C-41																			
42		✓ ✓	C-42																			
43		✓ ✓	C-43																			
44		✓ ✓	C-44																			
45		✓ ✓	C-45																			
46		✓ ✓	C-46																			
47		✓ ✓	C-47																			
48		✓ ✓	C-48																			
49		✓ ✓	C-49																			
13. Feb	50		Andesite slightly weathered, water-stained	✓ ✓	Light grey Andesite			C-50														
	51			✓ ✓		C-51																
	52			✓ ✓		C-52																
	53			✓ ✓		C-53																
	54			✓ ✓		C-54																
	55			✓ ✓		C-55																
	56			✓ ✓		C-56																
	57			✓ ✓		C-57																
	58			✓ ✓		C-58																
	59			✓ ✓		C-59																
	60	60				✓ ✓	C-60															

LOG FORM

HOLE NO. BP-04

# DRILL LOG

HOLE NO. BP-05 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	80 m	ELEVATION	592 m±							
SITE		POWER STATION SITE		COORDINATE		INCLINATION		DRILL RIG								
AVERAGE CORE RECOVERY		DATE		FROM	TO	DRILLED	S Laverinto	LOGGED	R E. Almontero							
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY		WATER PRESSURE TEST					DEPTH	
								R	Q D	EUGEN VALUE						
19. Feb 1983	1			HH	Yellowish brown Clayey Silt with pebbles		C-1									
	2			HH	Limestone fragments with Clayey Silt		C-2									
	3			HH			C-3									
	4			HH	Dirty white Limestone fragments with Clayey Silt		C-4									
	5			HH			C-5									
	6			HH			C-6									
	7			HH			C-7									
	8			HH			C-8									
	9			HH	Dirty white Limestone		C-9									
	10	10			HH		C-10									
21. Feb	11			HH			C-11									
	12			HH			C-12									
	13			HH	Dirty white Limestone		C-13									
	14			HH			C-14									
	15			HH			C-15									
	16			HH			C-16									
	17			HH			C-17									
	18			HH	Brown Clayey Silt with dirty white Limestone		C-18									
	19			HH			C-19									
	20	20			HH		C-20									
24. Feb	21			HH			C-21									
	22			HH			C-22									
	23			HH			C-23									
	24			VV												
	25	25		VV	Highly weathered Andesite, accomp. brown clay.											
	26			VV	Brown Clayey Silt cont. Limestone fragments											
	27			VV	ditto.											
	28			VV												
	29			VV												
	30	30		VV												

HOLE NO. BP-05

\*RQD is Rock Quality Designation, RQD = Total length of cylindrical cores longer than 10 cm / Total core length x 100%  
 \*LITHO VALLE is 1 mm in under injection water pressure of 10kg/cm<sup>2</sup>  
 \*DEPTH and ELEVATION are in meter  
 \*TRANSFER is in millimeter

NIPPON KOEI CO., LTD.  
CONSULTING ENGINEERS TOKYO

# DRILL LOG

HOLE NO. BP-05 SHEET NO. 2 OF 2

DATE	DEPTH (m)	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GCR WATER LEVEL	CORRECTION	R Q D	WATER PRESSURE (kg/cm <sup>2</sup> )		DEPTH (m)
										LOGON VALUE		
25. Feb	30		Highly weathered Andesite	✓ ✓	Brown Clayey Silt with dirty white Limestone fragment							30
	31	✓ ✓		31								
	32	✓ ✓		C-24								32
	33	✓ ✓										33
	34	✓ ✓										34
26. Feb	35		Dirty white Limestone and brown Claystone	✓ ✓								35
	36	✓ ✓		C-25								36
	37	✓ ✓										37
	38	✓ ✓		C-26								38
	39	✓ ✓										39
26. Feb	40		Brown tuffaceous Claystone	✓ ✓								40
	41	✓ ✓		C-27								41
	42	✓ ✓										42
	43	✓ ✓										43
	44	✓ ✓		C-28								44
27. Feb	45		Brown tuffaceous claystone	✓ ✓								45
	46	✓ ✓										46
	47	✓ ✓		C-29								47
	48	✓ ✓										48
	49	✓ ✓		C-30								49
27. Feb	50		Light grey, highly weathered Andesite	✓ ✓								50
	51	✓ ✓		C-31								51
	52	✓ ✓										52
	53	✓ ✓		C-32								53
	54	✓ ✓										54
27. Feb	55		Light grey, highly to moderately weathered Andesite	✓ ✓								55
	56	✓ ✓		C-33								56
	57	✓ ✓										57
	58	✓ ✓		C-34								58
	59	✓ ✓										59
27. Feb	60			✓ ✓								60

HOLE NO. BP-05

# DRILL LOG

HOLE NO. **BM-3** SHEET NO. **OF**

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	ELEVATION							
SITE		COORDINATE				INCLINATION	DRILL RIG							
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED								
DATE	DEPTH (m)	REMARKS	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	HIT & DIAMETER (mm)	GROUNDWATER LEVEL	CORE RECOVERY (%)	R Q D	WATER PRESSURE TEST (kg/cm <sup>2</sup> )	DEPTH (m)			
	0.30		Sand		Dark brown, fine and medium-grained sand with humus.									
1	1.20		Clay, Sand and Gravel		Dark brown, humus content: 10% Gravelly are mostly of Limestone of $\phi 10-80$ mm, sometimes of Andesite of $\phi 10-20$ mm.									
2			Gravels and Sands		Sub-angular gravels of $\phi 20-80$ mm up to 400 mm, occupying 80% in volume.	They are not suitable for impermeable materials due to high percent of gravel contents								
3														
4														
5														
6														
7														
8														
9														
10				Milky grey										
11				Yellowish grey										
12														
13														
14														
15	15.10													
16			Sands and Gravels.		Subangular gravels of $\phi 5-40$ mm, occupying 60% in volume Half of the gravels are of limestone The gravels are loosely cemented with medium- and coarse-grained sands Limestone gravel of 300 mm found at around depth 20 m. Gravel contents are higher at depth of 20 - 23 m	They are not suitable for impermeable materials due to high percent of gravel contents								
17														
18														
19														
20				Yellowish brown										
21														
22														
23	23.00													
24			Dark yellowish brown		Mostly subangular gravels of $\phi 5-30$ mm Gravels are mostly of andesite, diorite, basalt and tuff. (limestone is rarely mixed), seemingly to be derived from weathered conglomerate. Gravels are loosely cemented with medium- and coarse- sands.	They are not suitable for impermeable materials due to high percent of gravel contents								
25	25													
26														
27				Sands and Gravels (Heavily weathered conglomerate)										
28														
29														
30	30													

HOLE NO. BM-3

\* R Q D : Rock quality designation. R Q D : Total length of cylindrical cores longer than 10 cm. Total core length  $\times 100$ .  
 \* WATER VALUE is 1 mm under negative water pressure of 10 kg/cm<sup>2</sup>.  
 \* CORE LOSS and ELEVATION are in meter.  
 \* MEASUREMENT : all meters.

NIPPON KOEI CO., LTD.  
 CONSULTING ENGINEERS, TOKYO



# DRILL LOG

HOLE NO. BM-5 SHEET NO.      OF     

PROJECT MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	20.2 m	ELEVATION											
SITE COORDINATE				INCLINATION		DRILL RIG	Rotary										
DATE FROM 8 TO 15 Dec.				DRILLED BY	G Gomez	LOGGED BY											
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	HIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST LOGON VALUE					DEPTH		
	0.50		Clayey sand		Fine and medium-grained sands, mixed with clay (30-40%) and humus												
1			Milky and reddish grey		Mostly subangular gravels of φ20 - 100 mm, accompanying some sand and silt												
2																	
3							The gravel is of limestone porphyry gravels are mixed at the depth of 4.5 m										
4							Gravels are rather fine - φ15-20 mm - at the depth of 4.6 - 6.0 m.										
5																	
6			Gravels with sands		Gravels are red limestone at the depth of 6.5 - 8.95 m.												
7																	
8																	
9																	
10																	
10	60																
11			Yellow brown		Subangular gravels of φ10 - 40 mm, occupying 60% in volume												
12			Sands and gravels		Matrix are fine- to medium-grained sands (20 - 40%)												
13						Gravels are of andesite and basic tuff, rarely limestone											
14																	
14	50																
15	15		Yellow brown		Micro- and fine-grained sand occupying 30 - 40%												
16			Sandy Clay		Humus is mixed, giving dark colour in the upper portion.												
16	60																
17			Yellowish grey		Subangular gravels of φ10 - 60 mm, are predominated (40 - 60%).												
18			Sands and Gravels		Matrix are fine to medium grained sand, well-sorted.												
19						Gravels are of andesite tuff and rarely of limestone. They are seemed to be derived from conglomerate											
20																	
20	20																

HOLE NO. BM-5

100 M

\*RQD is Rock Quality Designation RQD: Total length of columns over longer than 10 cm Total core length = 100'  
 \*LOGON VALUE is 1 mm in under injection water pressure of 10kg/cm<sup>2</sup>  
 \*DEPTH and ELEVATION are in meter  
 \*DIAMETER is in millimeter

NIPPON KOEI CO., LTD.  
CONSULTING ENGINEERS, TOKYO

# DRILL LOG

HOLE NO. **BM-7** SHEET NO. **OF**     

PROJECT MATUNO RIVER DEVELOPMENT PROJECT						DEPTH	100 m	ELEVATION			
SITE						COORDINATE		DRILL RIG	Rotary		
AVERAGE CORE RECOVERY						DATE		DRILLED	G. Gomez		
						FROM		LOGGED			
						TO					
LEVEL	DEPTH	FORMATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	RIT DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST	DEPTH
										LOGON VALUE	
1			Dark brown to brown		Uppermost 30 cm contains humus, (cultivated top soil)						
2			Sand & Gravel mixed with Clay		50 - 70% in volume occupied by subangular gravel of φ20 - 40 mm.	most of them can be used as impervious materials					
3		Matrix is ill-sorted clay and fine-to coarse-grained sand.									
4											
5	5.00										
6	5.00	Yellow brown Sand & Gravel			Subangular gravel (limestone and andesite of φ5-30mm occupying 30-50% in volume.						
7	7.00	Dark brown Sand & Gravel with Clay			Matrix contains humus and clay.						
8		Milky yellow			Sandy portions is 20% in volume. Red limestone gravel is siliceous and φ10-300mm in diameter. Below 9.2 m, limestone boulder is predominate. Andesite gravel is predominant at the depth of 9.7 m.						
9		Reddish grey									
10	10.00	Gravels with Sands									

HOLE NO. **BM-7**

\*RQD is Rock Quality Designation, RQD Total length of cylinder cores longer than 10 cm Total core length 100  
 \*LOGON VALUE is 1 mm in under impervious water pressure of 10kg/cm  
 \*DEPTH and ELEVATION are in meter  
 \*DIAMETER is in millimeter

**NIPPON KOEI CO., LTD.**  
(CONSULTING ENGINEERS TOKYO)

# DRILL LOG

HOLE NO. BM-8 SHEET NO.      OF     

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	100m	ELEVATION				
SITE		COORDINATE		INCLINATION		DRILL RIG		Rotary				
AVERAGE CORE RECOVERY		DATE		FROM	TO	DRILLED	LOGGED					
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST		DEPTH
										LUGEON VALUE		
	0.80		Dark brown Clayey sand		Fine and medium-grained sand accompanies clay and humus. Limestone, tuff and andesite gravels are ø10 - 30 mm in diameter, occupying 10% in volume	They are not suitable as an impesmeable materials						
			Milky yellowish - Milky grey		Gravels of ø20 - 40 mm are predominant							
			Gravels with sands		Gravels are mostly of limestone, sometimes of andesite and basic tuff							
	100											

100.0000

HOLE NO. BM-8

\*RQD is Rock Quality Designation. RQD Total length of cylindrical cores longer than 10 cm. Total core length 100  
 \*LUGEON VALUE is 1 mm in under injection water pressure of 10kg/cm  
 \*DEPTH and ELEVATION are in meter  
 \*DIAMETER is in millimeter

NIPPON KOEI CO., LTD.  
CONSULTING ENGINEERS TOKYO

# DRILL LOG

HOLE NO. BM 9 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	60.0 m	ELEVATION							
SITE		COORDINATE		INCLINATION		DRILL RIG									
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED									
DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY		R Q D	WATER PRESSURE TEST				DEPTH
								%	NO		LUGEON VALUE				
	1		Yellowish brown Sand with Clay	[Diagram]	Medium- and coarse-grained sand contains clayey material. Subangular gravels of $\phi 2 - 10$ mm. Gravels are of corroded limestone										
	2														
	3		Yellow - brown Heavily-weathered Conglomerate	[Diagram]	Heavily weathered or decayed to earth. Subangular gravels of $\phi 10 - 60$ mm most of them are rotted out their texture. Matrix are fine- to medium grained sand. Core samples are recovered as well-cemented sand. Matrix at the depth of 5.0 - 6.4 m contains coarse sand (20%), sometimes accompanies hard gravel of $\phi 2 - 20$ mm.										
	4														
	5	5.0													
	6														
	7														
	8														
	9														
	10	10.00													
	11		Yellowish brown - Yellowish grey Moderately weathered Conglomerate	[Diagram]	Moderately weathered below the depth of 11.0 m. Gravels are scarcely rotted out. Limestone gravel is predominant in 11.0 - 12.8 m depth. Matrix is almost decayed out. A few gravels are recovered in 19.5 - 23.4 m. Limestone gravels are predominant in 23.4 - 25.3 m. Gravels increases in quantity at 26.5 - 29.5 m. Gravels are $\phi 5 - 40$ mm. Water strain in crack and surface of the gravels. Rather fresh conglomerate below 28.2 m. Matrix is often hard and well cemented with calcareous materials.										
	12														
	13														
	14														
	15	15.0													
	16														
	17														
	18														
	19														
	20	20.0													
	21														
	22														
	23														
	24														
	25	25.0													
	26														
	27														
	28	28.2													
	29	29.5													
	30	30.0													

HOLE NO. BM-9

\*RQD - Rock Quality Designation. RQD is Total length of cylinders more longer than 10 cm. Total core length - 100  
 \*LUGEON VALUE - 1 mm water injection water pressure of 10kg/cm<sup>2</sup>  
 \*DEPTH and RECOVERY are in meter  
 \*DIAMETER is in millimeter

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# DRILL LOG

HOLE NO. BM-9 SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	CORRECTION LEVEL	CORE RECOVERY	WATER PRESSURE TEST		DEPTH	
									R	Q		U
	31		Pale grey calcareous Conglomerate		Gravels are not so big - 42 - 40 mm, 30-40% in volume. Matrix is sandy, sometimes muddy.							31
	32		Sandstone		Medium- and coarse-grained. Core samples are 10-30 mm pieces.							32
	33		Blue-greenish grey Conglomerate		Core samples are all very hard gravels of 10-30 mm, which occupy 30-40%. Matrix is medium- and coarse-grained sand. Core sample is gravel, cemented with sandy matrix at the depth of 34 m.							33
	34					34						
	35	35.0				35						
	36	36.5				36						
	37		Dark greenish grey Siltstone		Well-consolidated, long continuous core samples obtained, containing subangular pebbles of 42 - 5 mm.							37
	38	38.05										38
	39		Dark bluish grey Conglomerate		Gravels are of 610 - 60 mm, sometimes cemented with matrix. Gravels are of andesite and tuff.							39
	40	40.0										40
	41	41.50										41
	42		Dark greenish grey Sandstone		Fine-grained at the upper parts. Medium- and coarse-grained at the lower parts. Core samples are gravels and cylindrical sandstone.							42
	43											43
	44	44.00										44
	45	45.0	Dark bluish grey Calcareous Conglomerate		Core samples are gravel of 420 - 40 mm. The gravels are of mainly andesite and tuff.							45
	46	46.00										46
	47		Dark bluish grey Sandstone		Core samples are fragmental, 45 - 20 mm. Coarse-grained and sometimes granular like.							47
	48	48.00										48
	49		Dark bluish grey Siltstone		Mixed with micro- to fine-grained sand. Well-cemented. Core samples are obtained as short cylindrical pieces, or platy fragments. Cracky along bedding plane.							49
	50	50.0										50
	51											51
	52											52
	53	53.00										53
	54		Dark greenish blue grey Conglomerate		Matrix is rather brittle. Core samples are obtained in fragments of 410 - 30 mm. Gravels are of andesite, diorite and tuff.							54
	55	55.0										55
	56											56
	57	57.50										57
	58		Dark greenish grey Sandstone		Micro- and fine-grained sand. Well-cemented, but crackly. Core samples are obtained in 45 - 40 mm fragments.							58
	59											59
	60	60.00										60

HOLE NO. BM-9

LOG FORM

# DRILL LOG

HOLE NO. BM-10 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	400 m	ELEVATION											
SITE		COORDINATE				INCLINATION		DRILL RIG	Rotary										
AVERAGE CORE RECOVERY		DATE	FROM 24	TO 29, Dec.	DRILLED	G. Gomez	LOGGED												
DATE	DEPTH	FORMATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY		R Q D	WATER PRESSURE TEST LUGFON VALVE					DEPTH			
								%	m		1	2	3	4	5				
	0.9		Brown Sand & Gravel		Mostly subangular gravels of 410-60 mm, mixed with grass roots. Gravels are of limestone, andesite and diorite. Matrix is fine- & medium-grained sand with clay.	Can be used as an impermeable material													
			Heavily weathered Conglomerate		Heavily weathered Conglomerate Gravels are thoroughly decayed to earth.														
	5.0				Dry drilling can be applicable.														
			Brown to yellowish brown		Gravels are of diorite, andesite, basalt, basic tuff and limestone.														
	10.0																		
	10.70																		
					Semi fresh														
					In core sample, only gravels are obtained.														
					Matrix are lost, due to brittleness														
	15.0		Bluish-green		Rock class may be C <sub>L</sub> - C <sub>M</sub> Matrix is medium-grained sand with pebbles of 2 - 10 mm.		Partly can be used as an impervious material												
			Slightly weathered Conglomerate		Gravels are of 20 - 80 mm, max. 200 mm.														
					No limestone gravel														
	20.0				Gravels are of andesite, basalt, diorite and basic tuff.														
	25.0																		
	30.0				Long cylindrical cores of andesite were recovered at the depth of 28 m.														

HOLE NO. BM-10

\*RQD is Rock Quality Designation RQD Total length of cylindrical cores longer than 10 cm. Total core length = 100  
 \*LUGFON VALVE is 1 mm m under injection water pressure of 10kg/cm  
 \*DEPTH and ELEVATION are in meter  
 \*DIAMETER is in millimeter

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# DRILL LOG

HOLE NO. BM-10 SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUT WATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST		DEPTH		
										LUGEON VALUE				
	30.0													
	31		Bluish green	0.0		Cannot be used as an impervious material due to coarseness						31		
	32			0.0										32
	33			0.0										33
	34			0.0										34
	35	35.0	Slightly weathered	0.0									35	
	36			0.0										36
	37		Conglomerate	0.0									37	
	38			0.0										38
	39			0.0										39
	40	40.0		0.0										40

100 FURU

HOLE NO. BM-10



# DRILL LOG

HOLE NO BM-11 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH		ELEVATION				
SITE						60.0 m						
AVERAGE CORE RECOVERY		COORDINATE				INCLINATION		DRILL RIG				
		DATE		FROM TO		DRILLED		LOGGED				
DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	CIRCUMFERENCE	LEVEL	CORF RECOVERY		WATER PRESSURE TEST		DEPTH
								cm	m	R	Q	
0.5		Yellowish brown Sand with gravel		Humus is mixed in top soil in 5 cm fine and coarse-grained sand, ill-sorted								
1		Yellow brown Sandstone		Heavily weathered to earth. Gravels are also decayed.								
2	2.0											
3		Milky yellow grey		Heavily weathered								
4		Heavily weathered		Core samples are obtained as sand and gravel.								
5	5.0	Limestone		Rock fragments can be smashed between fingers.								
5.70												
6				Moderately weathered below depth of 5.7 m.								
7				Core samples are recovered as gravels of 430-80 mm and crushed sand								
8				Core sample of length 5 cm was recovered at the depth of 8.0 m								
9		Moderately weathered										
10	10.0	Limestone										
11		Milky grey										
12												
13												
14												
15	15.0			Core samples of length 10 - 80 mm were recovered at the depth of 14.0 - 19.6 m								
16												
17												
18												
19												
19.80												
20	20.0			Limestone gravel of 42 - 10 mm and lenticular fragment of limestone, 42 - 5 mm were obtained								
21				Subangular gravel of andesite (410 - 30 mm) were scattered at the depth of 21.3 m								
22		Dark blue-green gray		Very soft, looks like cemented silt								
23												
24												
25	25.0	Calcareous siltstone		Soft and calcareous, easily smashed.								
26												
27												
28												
28.70												
29		Dark green grey Sandstone		Micro and fine-grained, rather soft. Calcareous layer intercalated in the lower part.								
29.90												

HOLE NO. BM-11

\* RQD is Rock Quality Designation, RQD = Total length of cylinder cores longer than 10 cm / Total core length x 100  
 \* LOGEON VALUE is a measure under injection water pressure of 10kg/cm<sup>2</sup>  
 \* DATE and ELEVATION are in meters  
 \* 10 MILLI METER is a millimeter

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# DRILL LOG

HOLE NO. BM-11 SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GROUNDWATER DEPTH	CORE RECOVERY	R Q D	WATER PRESSURE TEST				DEPTH
										LEUGEON VALUE				
	30.0		Dark green grey	[Symbol]	Calcareous fine-grained sandstone									
	31				Fresh, but soft									
	32				Can be drilled by dry drilling									
	33													
	34													
	35	35.0			Hard gravel of limestone (φ10 - 15 mm) is found at the depth of 34.8 m and 36.2 - 37.7 m.									
	36													
	37		Calcareous Sandstone	[Symbol]										
	38													
	39													
	40	40.0			Limestone gravel of φ10 - 60 mm are predominant in the depth of 39.2 - 45.3 m.									
	41													
	42													
	43													
	44		Milky green grey	[Symbol]										
	45	45.30												
	46		Dark green grey Sandstone	[Symbol]	Mixed with silt Rather soft									
	46.70													
	47		Milky green grey Calcareous Sandstone	[Symbol]	Rather soft, containing limestone gravel (φ10 - 60 mm)									
	48													
	49				Less calcareous and greenish in colour between depth 48.3-51.2 m hard limestone gravel of φ10-30 mm are mixed at the depth 49.7 m									
	50	50.0												
	51		Dark greenish grey	[Symbol]	Micro- and fine-grained calcareous sandstone									
	52				Rather soft, limestone gravels are decayed									
	53		Sandstone	[Symbol]	Limestone gravels of φ5 - 30 mm are scattered in the depth 51.2 - 51.5 m									
	54													
	55	55.0			Less calcareous and greenish in colour at the depth of 52.7 - 60.0 m									
	56													
	57													
	58													
	59													
	60	60.0												

LOG FORM

HOLE NO. BM-11

# DRILL LOG

HOLE NO. BM-12 SHEET NO. 1 OF 2

PROJECT SITE		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	ELEVATION	
AVERAGE CORE RECOVERY		COORDINATE	DATE	FROM	TO	INCLINATION	DRILL RIG	
DATE	DEPTH	STRACTION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	CORE RECOVERY	WATER PRESSURE TEST
							R Q D	LOG-ON VALUE
1			Dark brown		Humus			
2			Sandy Clay		Micro-and medium-grained sand contained in 20% Limestone gravel of 610-30 mm were scattered. Containing many gravels in lower 50 cm.			
3	3 00							
4			Milky grey		Core samples obtained were all limestone of 610 - 40 mm and cylindrical shape of 10 - 15 cm length. These gravels are presumably imbedded in sandy matrix.			
5	5 0		Gravel					
6								
7								
8								
9								
10	10 0							
11			Yellow brown Sand & Clay		Fine and coarse-grained sand mixed with clay.			
12								
13			Dark grey		Limestone gravels of 610 - 40 mm occupy 50% in quantity.			
14					Matrix contain much clay in the depth of 12 0 - 14.5 m.			
15	15 0							
16								
17								
18			Sand and Gravel					
19			Yellowish brown		Gravel contents decreases, sand contents increases in depth 20 0 - 22.5 m			
20	20 0							
21								
22								
23								
24								
25	25 0		Yellowish grey					
26								
27								
28			Sand & Gravel (heavily weathered conglomerate)		Core sample cannot be recovered, slime sample is obtained in return water.			
29								
30	30 0							

Unsuitable for impermeable material due to big limestone boulder

They can be used as impermeable material but not economical for exploitation, due to removal of heavy overburden

HOLE NO. BM-12

\* Core samples in question. R Q D: Total length of cylinder cores longer than 10 cm. Total core length = 100  
 \* LOG VALUE is in mm under injection water pressure of 10kg/cm<sup>2</sup>  
 \* DEPTH and ELEVATION are in meter  
 \* DIAMETER is in millimeter

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# DRILL LOG

HOLE NO. BM-12 SHEET NO. 2 OF 2

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUT WATER	CORRECTION	RECOVERY	R Q D	WATER PRESSURE TEST		DEPTH
											HUGON VALUE		
	30.0												
	31		Dark blue-greenish grey										
	32												
	33				Gravels are of andesite, diorite, basic tuff, basalt, sandstone and limestone.								
	34		Sand and Gravel										
	35	35.0											
	36		(heavily weathered conglomerate)		They are supposed to be heavily weathered conglomerate.								
	37												
	38												
	39												
	40	40.0											

HOLE NO. BM-12

# DRILL LOG

HOLE NO. BM-13 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	ELEVATION							
SITE		COORDINATE				INCLINATION	DRILL RIG							
AVERAGE CORE RECOVERY		DATE	FROM	TO	DRILLED	LOGGED								
DATE	DEPTH	FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST				DEPTH	
									LUGFON VALVE					
	0.50	Yellowish brown clayey sand		Fine- and medium-grained sand, containing 20-30% clay	They can be used as impermeable materials									
1	1.80	Yellowish gray Sand & Gravel		Gravel of decayed limestone of 42-50 mm accompanying hard andesite gravel in 30-40% Gravels are cemented with fine- to medium-grained sand										
2	2.10	Yellowish brown Conglomerate		Andesite gravel of 42-50 mm predominant Matrix is loosely cemented due to heavy weathering										
3														
4		Yellowish brown Sandstone		Mostly of fine- to medium-grained sand. They are weathered and soft. Andesite gravel of 430 mm is included at the depth of 4.1 m. Lenticular and calcareous layer (2-6 mm) is intercalated below depth 8.0 m										
5	5.0													
6														
7														
8	8.40													
9	9.00	Calcareous Conglomerate		Calcareous Conglomerate with gravels of 45-50 mm										
10	10.0			Matrix is brittle Small gravels of 42-20 mm										
11		Yellowish brown Conglomerate		Matrix is mostly fine- to medium sand. Andesite gravels of 420-40 mm are predominant.										
12														
13														
14	14.00													
15	15.0	Blue-greenish grey		Less water-stained, seemingly fresh Generally soft Andesite gravels of 2-20 mm included										
16														
17				Matrix is rather hard Core sample of 410 cm length was obtained at 17 m.										
18														
19	19.00	Dark grey		Matrix are clay and sand, easily smashed between fingers. Coarse grained sand and fine gravel mixed at 19.0-19.6 m.										
20	20.0													
21														
22		Calcareous mudstone		Calcareous at depth of 20.5-21.1 m and 22.5-25.15 m										
23														
24														
25		Blue-greenish grey												
26														
27														
28														
29	29.00	Calcareous Conglomeratic mudstone		Moderately weathered rather hard.										
30														

HOLE NO. BM-13

\* R Q D is Rock Quality Designation. R Q D = Total length of cylinder cores longer than 10 cm / Total core length  
 \*\* LUGFON VALVE is 1 cm in inside diameter water pressure of 10 kg/cm<sup>2</sup>  
 † BIT DIAMETER and ELEVATION are in meter  
 ‡ LUGFON VALVE is in millimeter

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# DRILL LOG

HOLE NO. BM-13 SHEET NO. 2 OF 2

ELEVATION	DEPTH	FORMATION	LITHO SECTION	DESCRIPTION	BIT DIAMETER	GROSS WATER FLOW	CORE RECOVERY	WATER PRESSURE TEST							DEPTH	
								LOGEON VALUE								
								R	Q	D						
30.00	31	Calcareous conglomerate mudstone		Andesite gravels of 45 - 40 mm are contained in 30% at the depth of 29 - 31 m.												
	32			Limestone gravel is predominant in the depth 32.0 - 34.0 m												
34.0	34															
35.0	35	Dark grey silty Sandstone		Rather soft Core sample is clayey sand accompanied no gravel.												
36.0	36	Dark grey Calcareous Mudstone		Calcareous, well-cemented												
	37			Core samples are 3 - 8 cm in length												
	38			Partly fragments of 40 - 60 mm.												
40.0	40															

HOLE NO. BM-13

# DRILL LOG

HOLE NO. BM-14 SHEET NO. 1 OF 2

PROJECT		MATUNO RIVER DEVELOPMENT PROJECT				DEPTH	40.0m		ELEVATION		
SEE AVERAGE CORE RECOVERY		COORDINATE		DATE	FROM	TO	INCLINATION	DRILL RIG			
DEPTH	CORRECTION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY	R Q D	WATER PRESSURE TEST		DEPTH
									LOCATION	VALUE	
1		Milky grey Limestone		Hard	Unsuitable for as an impermeable material						
2				Water-stained along cracks							
3				Depth. 0 - 3.0 m moderately weathered & cracky							
4				Core samples are gravels of 10 - 40 mm							
5	5.0			C <sub>L</sub> - C <sub>M</sub> in rock classification							
6				Corrosion cavities are often found.							
7											
8											
9											
10	10.0										
11		Milky grey Marl		Mudstone layers intercalated irregularly							
12				Rather fresh facies, rather soft.							
13											
14	13.60										
15	15.0										
16											
17											
18											
19											
20	20.0										
21		Calcareous Mudstone		Core samples are recovered in 65 - 40 mm size							
22				Calcareous lenses are intercalated soft, core samples are clay and gravel							
23											
24											
25	25.0										
26											
27											
28											
29	29.10										
30	30.0										

HOLE NO. BM-14

+ ( ) = This equals to square RQD Total length of cylinder cores longer than 10 cm Total core length = 100  
 + ( ) FOR VALUE is 1 mm in under inportion water pressure of 10kg/cm  
 + ( ) FOR and ELEVATION are in meter  
 + ( ) FOR is in millimeter

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# DRILL LOG

HOLE NO. BM-14 SHEET NO. 2 OF 2

DEPTH (M)	DEPTH (FT)	LITHOLOGY	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	MOISTURE CLASSIFIER	WATER CONTENT (%)	CORE RECOVERY (%)	R Q D	WATER PRESSURE TEST		DEPTH (M)
										DEPTH (M)	DEPTH (FT)	
31	30.0		Greenish Calcareous Mudstone		Soft, Core samples are clay & gravel. Calcareous lenses are intercalated.							31
32	31.40		Milky grey Marl		Mudstone layer is intercalated repeatedly. Cracky, core samples are gravels of 610 - 30 mm. CL - CM in rock classification.							32
33												33
34												34
35	35.0		Greenish grey Calcareous Mudstone		Solid clay with pebbles, containing calcareous lense of 2 - 3 mm thickness, soft rock.							35
36	35.40											36
37	37.00		Dark grey - Milky grey Marl		Hard core sample of 10 cm length are obtained in upper 1 m layer. Muddy core samples of 10 - 40 mm fragment are recovered in lower 2 m layer. CL - CM in rock classification.							37
38												38
39												39
40	40.0											40

HOLE NO. BM-14

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY A DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA-3-1 GROUND WATER LEVEL - 3.0 m

DATE	DEPTH m	SECTION LENGTH L, m	HOLE RADIUS r, cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> , cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> , cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> H, cm	WATER LEAKAGE		CALCULATING CONST $\frac{2.3}{4\pi} \times \frac{1}{M} \times \frac{L}{\log \frac{L}{r}}$ C, mlh/cm <sup>2</sup> sec	Q ml/min	COEFFICIENT OF PERMEABILITY K = Q/H x C mlsec L = Q/L x H x 10 <sup>10</sup>	LUGEON UNIT L = Q/L x H x 10 <sup>10</sup>
				P, kg/cm <sup>2</sup>	H <sub>p</sub> , cm				Q, l/min	Q, cm <sup>3</sup> /min				
	200 - 500	300	30	1	1000	300	50	1350	22	22000			$6.63 \times 10^{-4}$	523
				2	2000			2350	41	91000			$7.10 \times 10^{-4}$	582
	100 - 1500	300	30	1	1000	300	50	1350	15	15000			$4.52 \times 10^{-4}$	370
				2	2000			2350	22	22000			$3.81 \times 10^{-4}$	312
				4	4000			4350	31	31000			$2.90 \times 10^{-4}$	238
				6	6000			6350	40	40000			$2.56 \times 10^{-4}$	210
				4	4000			4350	31	31000			$2.90 \times 10^{-4}$	238
				2	2000			2350	21	21000			$3.64 \times 10^{-4}$	298
				1	1000			1350	11	11000			$4.82 \times 10^{-4}$	395
	1500 - 1700	300	30	1	1000	300	50	1350	31	31000			$7.93 \times 10^{-4}$	265
				2	2000			2350	41	41000			$6.03 \times 10^{-4}$	582
				1	1000			1350	30	30000			$7.68 \times 10^{-4}$	261
	1700 - 2000	300	30	1	1000	300	50	1350	28	28000			$9.34 \times 10^{-4}$	691
				2	2000			2350	33	33000			$5.71 \times 10^{-4}$	468
				4	4000			4350	42	42000			$3.93 \times 10^{-4}$	322
				2	2000			2350	33	33000			$5.71 \times 10^{-4}$	468
				1	1000			1350	27	27000			$8.14 \times 10^{-4}$	667
	2000 - 2300	300	30	1	1000	300	50	1350	7	7000			$2.11 \times 10^{-4}$	173
				2	2000			2350	9	9000			$1.56 \times 10^{-4}$	127
				4	4000			4350	11	11000			$1.03 \times 10^{-4}$	84
				1	1000			1350	12	12000			$2.69 \times 10^{-4}$	213
				4	4000			4350	11	11000			$1.03 \times 10^{-4}$	84
				2	2000			2350	9	9000			$1.56 \times 10^{-4}$	127
				1	1000			1350	7	7000			$2.11 \times 10^{-4}$	173
	2300 - 2600			Water was unable to be injected.										
	2600 - 2900			Water was unable to be injected.										



# RECORD OF WATER PRESSURE TEST

PROJECT MATUANO RIVER DEVELOP LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA - 2 - 2 GROUND WATER LEVEL -3.0m

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> H cm	WATER LEAKAGE		CALCULATING CONST $\frac{1}{2} \times \frac{1}{60} \times \frac{1}{100} \times \frac{1}{100}$ C min/cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/H×C ml/sec	LUGEON UNIT Lu=Q/L×H×10 <sup>8</sup>
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm				Q' l/min	Q cm <sup>3</sup> /min				
	2700	300	30	1	1000	300	30	1350	9	7000		9	271 × 10 <sup>-4</sup>	22.2
				2	2000			2350	13	13000		13	225 × 10 <sup>-4</sup>	18.4
				4	4000			4350	25	25000		25	234 × 10 <sup>-4</sup>	19.2
				6	6000			6350	34	34000		34	218 × 10 <sup>-4</sup>	17.8
				8	8000			8350	40	40000		40	195 × 10 <sup>-4</sup>	16.0
				6	6000			6350	33	33000		33	211 × 10 <sup>-4</sup>	17.3
				4	4000			4350	25	25000		25	234 × 10 <sup>-4</sup>	19.2
				2	2000			2350	13	13000		13	225 × 10 <sup>-4</sup>	18.4
				1	1000			1350	9	9000		9	271 × 10 <sup>-4</sup>	22.2
	3200	300	30	1	1000	300	30	1350	18	18000		18	542 × 10 <sup>-4</sup>	44.4
				2	2000			2350	23	23000		23	398 × 10 <sup>-4</sup>	32.6
				4	4000			4350	40	40000		40	374 × 10 <sup>-4</sup>	30.7
				6	6000			6350	44	44000		44	282 × 10 <sup>-4</sup>	23.1
				4	4000			4350	30	30000		30	374 × 10 <sup>-4</sup>	30.7
				2	2000			2350	23	23000		23	398 × 10 <sup>-4</sup>	32.6
				1	1000			1350	18	18000		18	542 × 10 <sup>-4</sup>	44.4
	3500	300	30	1	1000	300	30	1350	27	27000		27	814 × 10 <sup>-4</sup>	66.7
				2	2000			2350	29	29000		29	502 × 10 <sup>-4</sup>	41.1
				4	4000			4350	44	44000		44	355 × 10 <sup>-4</sup>	29.1
				6	6000			6350	43	43000		43	275 × 10 <sup>-4</sup>	22.6
				4	4000			4350	39	39000		39	365 × 10 <sup>-4</sup>	29.9
				2	2000			2350	29	29000		29	502 × 10 <sup>-4</sup>	41.1
				1	1000			1350	26	26000		26	283 × 10 <sup>-4</sup>	22.2
	3800	300	30	1	1000	300	30	1350	5	5000		5	121 × 10 <sup>-4</sup>	9.9
				2	2000			2350	5	5000		5	865 × 10 <sup>-5</sup>	7.1
				4	4000			4350	6	6000		6	5.61 × 10 <sup>-5</sup>	4.6
				6	6000			6350	7	7000		7	448 × 10 <sup>-5</sup>	3.7
				4	4000			4350	6	6000		6	5.61 × 10 <sup>-5</sup>	4.6
				2	2000			2350	5	5000		5	865 × 10 <sup>-5</sup>	7.1



# RECORD OF WATER PRESSURE TEST

PROJECT MATUNDI RIVER DEVELOPMENT LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA - 3 GROUND WATER LEVEL - 39.50 m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD		WATER LEAKAGE Q l/min	CALCULATING CONST $\frac{1.1}{4\pi} \times \frac{L}{r^2} \times \frac{1}{\log \frac{L}{r}}$ C cm <sup>2</sup> /cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/H x C m/sec	LOGEON UNIT L = Q/L x H x W
				HEAD P kg/cm <sup>2</sup>	H <sub>p</sub> cm			H <sub>p</sub> + H <sub>g</sub> + H <sub>s</sub> H cm	Q cm <sup>3</sup> /min					
	800 - 1100	300	3.0	1	1000	950	400	3350	29	29000		5.02 x 10 <sup>-4</sup>	46.1	
				2	2000			3350	34	34000		4.13 x 10 <sup>-4</sup>	39.8	
				1	1000			2350	28	28000		4.85 x 10 <sup>-4</sup>	39.7	
	1100 - 1400	300	3.0	1	1000	1250	400	2650	29	29000		4.37 x 10 <sup>-4</sup>	36.5	
				2	2000			2650	43	43000		4.79 x 10 <sup>-4</sup>	39.3	
				1	1000			2650	34	34000		5.22 x 10 <sup>-4</sup>	42.8	
	1400 - 1700			Water was unable to be injected.									0	0
	1700 - 2000	300	3.0	1	1000	1850	400	3250	30	30000		3.75 x 10 <sup>-4</sup>	36.8	
				2	2000			4250	41	41000		3.92 x 10 <sup>-4</sup>	32.2	
				1	1000			3250	29	29000		3.63 x 10 <sup>-4</sup>	29.7	
	2000 - 2300	300	3.0	1	1000	2150	400	3550	34	34000		3.90 x 10 <sup>-4</sup>	31.9	
	2300 - 2600	300	3.0	1	1000	2450	400	3850	23	23000		2.43 x 10 <sup>-4</sup>	19.9	
	2600 - 2900	300	3.0	1	1000	2750	400	4150	39	39000		3.82 x 10 <sup>-4</sup>	31.3	
	2900 - 3200	300	3.0	1	1000	3050	400	4450	23	23000		2.10 x 10 <sup>-4</sup>	17.2	
				2	2000			5450	25	25000		1.87 x 10 <sup>-4</sup>	15.3	
				1	1000			4450	22	22000		2.01 x 10 <sup>-4</sup>	16.5	
	3200 - 3500	300	3.0	1	1000	3350	400	4750	27	27000		3.17 x 10 <sup>-4</sup>	26.0	
	3500 - 3800	300	3.0	1	1000	3650	400	5050	20	20000		3.22 x 10 <sup>-4</sup>	26.4	
	3800 - 4100	300	3.0	1	1000	3950	400	5350	22	22000		2.19 x 10 <sup>-4</sup>	26.2	
	4100 - 4400	300	3.0	1	1000	3950	400	5350	44	44000		3.35 x 10 <sup>-4</sup>	27.4	
		Below 4400 m		Water was unable to be injected.									0	0

# RECORD OF WATER PRESSURE TEST

PROJECT MAJUNO RIVER DEVELOPMENT LOCALITY A. DAM SITE RIGHT-BANK ABUTMENT  
 BORE-HOLE No BA-4 GROUND WATER LEVEL - 9.50 m.

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>0</sub> + H <sub>s</sub> + H <sub>g</sub> H cm	WATER LEAKAGE		CALCULATING CONST $\frac{2.3}{2.3} \times \frac{1}{2} \times \frac{1}{2} \log \frac{1}{1}$ C. ml/d/m <sup>2</sup> /sec	Q H cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/(RxC) cm/sec	LUGEON UNIT L <sub>u</sub> =Q/(L-RxH)
				PRESSURE P kg/cm <sup>2</sup>	HEAD H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min				
	25.00 ~ 30.00	500	3.8	1	1000	950	65	2015	3.8	3800	2.586 x 10 <sup>-5</sup>	1.97	4.8 x 10 <sup>-5</sup>	3.7
				4	4000			3015	19.7	18700		3.73	9.6 x 10 <sup>-5</sup>	7.5
				7	7000			8015	22.1	22100		2.76	7.1 x 10 <sup>-5</sup>	5.5
				10	10000			11015	31.9	31800		2.97	7.5 x 10 <sup>-5</sup>	5.8
				7	7000			8015	20.8	20800		2.57	6.7 x 10 <sup>-5</sup>	5.2
				4	4000			5015	17.3	17300		3.45	8.7 x 10 <sup>-5</sup>	6.7
				1	1000			2015	9.2	9200		4.97	1.1 x 10 <sup>-4</sup>	8.1
	30.00 ~ 35.00	500	3.8	1	1000	950	65	2015	1.8	1800	2.586 x 10 <sup>-5</sup>	0.87	2.3 x 10 <sup>-5</sup>	1.8
				1	1000	950	65	2015	9.4	9400	2.586 x 10 <sup>-5</sup>	4.87	1.2 x 10 <sup>-4</sup>	9.3
				4	4000			5015	14.2	14200		2.93	7.3 x 10 <sup>-5</sup>	5.7
				7	7000			8015	22.3	22300		2.78	7.2 x 10 <sup>-5</sup>	5.6
				10	10000			11015	29.3	29300		2.46	6.8 x 10 <sup>-5</sup>	5.3
				7	7000			8015	18.7	18700		2.36	6.1 x 10 <sup>-5</sup>	4.7
				4	4000			5015	15.8	15800		3.15	8.1 x 10 <sup>-5</sup>	6.3
				1	1000			2015	11.2	11200		5.56	1.4 x 10 <sup>-4</sup>	11.1
	40.00 ~ 45.00	500	3.8	1	1000	950	65	2015	9.9	9900	2.586 x 10 <sup>-5</sup>	4.42	1.1 x 10 <sup>-4</sup>	8.8
				4	4000			5015	15.4	15400		3.87	1.0 x 10 <sup>-4</sup>	7.7
				7	7000			8015	27.6	27600		3.44	8.7 x 10 <sup>-5</sup>	6.8
				10	10000			11015	32.7	32700		2.97	7.7 x 10 <sup>-5</sup>	5.7
				7	7000			8015	26.5	26500		3.30	8.6 x 10 <sup>-5</sup>	6.6
				4	4000			5015	17.7	17700		3.53	9.1 x 10 <sup>-5</sup>	7.1
				1	1000			2015	11.3	11300		5.61	1.5 x 10 <sup>-4</sup>	11.2
	45.00 ~ 50.00	500	3.8	1	1000	950	65	2015	13.2	13200	2.586 x 10 <sup>-5</sup>	6.55	1.7 x 10 <sup>-4</sup>	13.1
				4	4000			5015	21.1	21100		4.21	1.1 x 10 <sup>-4</sup>	8.4
				7	7000			8015	29.6	28600		3.57	9.2 x 10 <sup>-5</sup>	7.1
				10	10000			11015	35.1	35100		3.19	8.2 x 10 <sup>-5</sup>	6.4
				7	7000			8015	27.5	27500		3.43	8.7 x 10 <sup>-5</sup>	6.7
				4	4000			5015	18.6	18600		3.71	9.6 x 10 <sup>-5</sup>	7.4
				1	1000			2015	10.3	10300		5.11	1.3 x 10 <sup>-4</sup>	10.2

# RECORD OF WATER PRESSURE TEST

PROJECT: MAJUNO RIVER DEVELOPMENT LOCALITY: Δ DAM SITE RIVER BED  
 BORE-HOLE No: BA-5 (1) GROUND WATER LEVEL: 0 m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD		WATER LEAKAGE		CALCULATING CONST $\frac{r^2}{2L} \times \frac{1}{C} \times \frac{1}{\log \frac{L}{r}}$ C min/cm sec	H cm	COEFFICIENT OF PERMEABILITY K-Q/Hx C cm/sec	LUGEON UNIT L <sub>u</sub> = Q / L · H · H <sub>g</sub>
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm			H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> H cm	Q l/min	Q cm <sup>3</sup> /min					
	10.00 ~ 15.00	500	3.8	1	1000	0	65	1065	17.2	17200	2.586 × 10 <sup>-5</sup>	16.15	4.2 × 10 <sup>-4</sup>	32.3	
				4	4000			4065	33.7	33900		8.34	2.2 × 10 <sup>-4</sup>	16.7	
				7	7000			7065	47.3	47100		6.67	1.7 × 10 <sup>-4</sup>	13.4	
				10	10000			10065	53.4	53400		5.31	1.4 × 10 <sup>-4</sup>	10.6	
				7	7000			7065	38.6	38600		5.46	1.4 × 10 <sup>-4</sup>	10.9	
				4	4000			4065	21.7	21700		5.34	1.4 × 10 <sup>-4</sup>	10.7	
				1	1000			1065	12.9	12400		11.60	3.0 × 10 <sup>-4</sup>	23.3	
	15.00 ~ 20.00			1	1000	0	65	1065	14.7	14700	2.586 × 10 <sup>-5</sup>	13.80	3.6 × 10 <sup>-4</sup>	27.6	
				4	4000			4065	21.7	21900		5.37	1.4 × 10 <sup>-4</sup>	10.8	
				7	7000			7065	32.5	32500		4.10	1.2 × 10 <sup>-4</sup>	9.2	
				10	10000			10065	48.7	48700		4.74	1.3 × 10 <sup>-4</sup>	9.7	
				7	7000			7065	30.7	30700		4.35	1.1 × 10 <sup>-4</sup>	8.7	
				4	4000			4065	19.3	19300		4.75	1.2 × 10 <sup>-4</sup>	9.5	
				1	1000			1065	12.8	12800		12.02	3.1 × 10 <sup>-4</sup>	24.0	
	20.00 ~ 25.00	500	3.8	1	1000	0	65	1065	19.4	19400	2.586 × 10 <sup>-5</sup>	18.22	4.7 × 10 <sup>-4</sup>	36.4	
				4	4000			4065	30.6	30600		7.53	1.7 × 10 <sup>-4</sup>	15.1	
				7	7000			7065	55.1	55100		7.78	2.0 × 10 <sup>-4</sup>	15.6	
				10	10000			10065	67.2	67200		6.18	1.7 × 10 <sup>-4</sup>	13.4	
				7	7000			7065	53.9	53900		7.50	1.9 × 10 <sup>-4</sup>	15.0	
				4	4000			4065	28.7	28700		7.11	1.8 × 10 <sup>-4</sup>	14.2	
				1	1000			1065	17.5	17500		16.40	4.2 × 10 <sup>-4</sup>	32.9	
	25.00 ~ 30.00	500	3.8	1	1000	0	65	1065	21.8	21800	2.586 × 10 <sup>-5</sup>	20.46	5.3 × 10 <sup>-4</sup>	40.7	
				4	4000			4065	35.3	35300		8.88	2.2 × 10 <sup>-4</sup>	17.3	
				7	7000			7065	52.7	52700		8.45	2.2 × 10 <sup>-4</sup>	16.7	
				10	10000			10065	74.4	74400		7.37	1.9 × 10 <sup>-4</sup>	14.7	
				7	7000			7065	58.4	58400		8.27	2.1 × 10 <sup>-4</sup>	16.5	
				4	4000			4065	33.6	33600		8.27	2.1 × 10 <sup>-4</sup>	16.5	
				1	1000			1065	17.8	17800		18.57	4.8 × 10 <sup>-4</sup>	37.2	

# RECORD OF WATER PRESSURE TEST

PROJECT MAIUNO RIVER DEVELOPMENT LOCALITY A-DAM SITE RIVER BED  
 BORE HOLE No. BA-5 (2) GROUND WATER LEVEL 0 m

DATE	DEPTH m	SECTION LENGTH L, m	HOLE RADIUS r, cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE Hs, cm	PRESSURE GAUGE HEIGHT Hg, cm	TOTAL HEAD Hp + Hs + Hg, cm	WATER LEAKAGE		CALCULATING CONST $\frac{1.3 \times 10^{-5}}{2r} \times \frac{L}{\log \frac{L}{r}}$	S cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/Hx C m/sec	LUGEON UNIT Lu=Q/L Hx10 <sup>10</sup>
				P kg/cm <sup>2</sup>	Hp, cm				Q l/min	Q cm <sup>3</sup> /min				
	30.00 ~ 35.00	500	3.8	1	1,000	0	65	1065	15.4	15400	$2.586 \times 10^{-5}$	14.66	$3.7 \times 10^{-4}$	28.7
				4	4,000			4665	26.1	26100		6.92	$1.7 \times 10^{-4}$	12.8
				7	7,000			7665	36.1	36100		5.11	$1.3 \times 10^{-4}$	10.2
				10	10,000			10665	48.4	48400		4.81	$1.2 \times 10^{-4}$	9.6
				7	7,000			7665	34.8	34800		4.93	$1.3 \times 10^{-4}$	9.9
				4	4,000			4665	23.0	23000		5.66	$1.5 \times 10^{-4}$	11.2
				1	1,000			1065	13.5	13500		12.68	$3.3 \times 10^{-4}$	25.3
	35.00 ~ 40.00			1	1,000	0	65	1065	12.1	12100	$2.586 \times 10^{-5}$	11.34	$2.7 \times 10^{-4}$	22.7
				4	4,000			4665	18.8	18800		4.62	$1.2 \times 10^{-4}$	9.2
				7	7,000			7665	24.7	24700		3.50	$9.0 \times 10^{-5}$	7.0
				10	10,000			10665	28.5	28500		2.93	$7.6 \times 10^{-5}$	5.7
				7	7,000			7665	23.6	23600		3.34	$8.6 \times 10^{-5}$	6.7
				4	4,000			4665	17.6	17600		4.33	$1.2 \times 10^{-4}$	8.7
				1	1,000			1065	9.4	9400		8.93	$2.3 \times 10^{-4}$	17.6

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNJO RIVER DEVELOPMENT LOCALITY A - DAM SITE, LEFT ABUTMENT  
 BORE-HOLE No. BA-6-1 GROUND WATER LEVEL - 58.0 m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE Hs cm	PRESSURE GAUGE HEIGHT Hg cm	TOTAL HEAD		WATER LEAKAGE Q l/min	CALCULATING CONST C ml/cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/HX C/SEC	LUGEON UNIT Lu=Q/LHXMP
				HEAD Hp cm	HEAD H cm			Hp + Hg + Hs cm	H cm					
	38.00 - 41.00	300	3.0	4	4000	2800	65	3465	30	30000			1.89 x 10 <sup>-6</sup>	15.5
				2	3000			4465	23	23000			2.10 x 10 <sup>-6</sup>	17.2
				1	1000			3465	19	19000			2.23 x 10 <sup>-6</sup>	18.3
22.05.7	41.00 - 44.00	300	3.0	1	1000	2800	45	3245	19	19000			2.23 x 10 <sup>-6</sup>	18.3
				2	2000			4265	21	21000			1.91 x 10 <sup>-6</sup>	15.7
				4	4000			4865	26	26000			1.68 x 10 <sup>-6</sup>	13.8
				6	6000			5465	31	31000			1.49 x 10 <sup>-6</sup>	12.2
				8	8000			6065	36	36000			1.40 x 10 <sup>-6</sup>	11.5
				10	10000			6665	42	42000			1.37 x 10 <sup>-6</sup>	11.2
				8	8000			6065	36	36000			1.40 x 10 <sup>-6</sup>	11.5
				6	6000			5465	31	31000			1.49 x 10 <sup>-6</sup>	12.2
				4	4000			4865	26	26000			1.64 x 10 <sup>-6</sup>	14.8
				2	2000			4265	19	19000			1.76 x 10 <sup>-6</sup>	16.4
				1	1000			3665	15	15000				
22.05.7	48.00 - 51.00	300	3.0	1	1000	2800	65	3465	11	11000			1.29 x 10 <sup>-6</sup>	10.6
				2	2000			4265	13	13000			1.18 x 10 <sup>-6</sup>	9.7
				4	4000			4865	19	19000			1.20 x 10 <sup>-6</sup>	9.8
				6	6000			5465	21	21000			1.01 x 10 <sup>-6</sup>	8.3
				8	8000			6065	25	25000			9.72 x 10 <sup>-6</sup>	8.0
				10	10000			6665	28	28000			9.14 x 10 <sup>-6</sup>	7.5
				8	8000			6065	24	24000			9.33 x 10 <sup>-6</sup>	7.6
				6	6000			5465	20	20000			9.61 x 10 <sup>-6</sup>	7.9
				4	4000			4865	14	14000			8.81 x 10 <sup>-6</sup>	7.2
				2	2000			4265	19	19000			1.73 x 10 <sup>-6</sup>	14.2
				1	1000			3665	11	11000			1.29 x 10 <sup>-6</sup>	10.6
22.05.7	47.00 - 50.00	300	3.0	1	1000	2800	65	3465	9	9000			4.70 x 10 <sup>-6</sup>	3.8
				2	2000			4265	6	6000			5.87 x 10 <sup>-6</sup>	4.5
				4	4000			4865	12	12000			7.55 x 10 <sup>-6</sup>	6.2
				6	6000			5465	15	15000			7.21 x 10 <sup>-6</sup>	5.9

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNG RIVER DEVELOPMENT LOCALITY A - DAM SITE LEFT ABUTMENT  
 BORE-HOLE No BA-6-2 GROUND WATER LEVEL - 28.0m

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE Hs cm	PRESSURE GAUGE HEIGHT Hg cm	TOTAL HEAD Hp + Hs + Hg cm	WATER LEAKAGE		CALCULATING CONST $\frac{1}{2} \times \frac{1}{R} \times \frac{1}{\log \frac{L}{r}}$ C min/msec	Q H cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/Hx C/msec	LUGEON UNIT Lu=Q/LxHxH			
				P kg/cm <sup>2</sup>	Hp cm				Q l/min	Q cm <sup>3</sup> /min							
15 OCT. 3200	3000	300	3.0	1	1000	2800	65	3465	29	29000			$3.40 \times 10^{-6}$	27.9			
				2	2000			33000						$3.01 \times 10^{-6}$	28.6		
				4	5000			39000							$2.45 \times 10^{-6}$	28.1	
				6	6000			51000							$2.45 \times 10^{-6}$	20.1	
				8	8000			55000							$2.14 \times 10^{-6}$	17.5	
				10	10000			58000								$1.89 \times 10^{-6}$	15.5
				8	8000			55000								$2.18 \times 10^{-6}$	12.8
				6	6000			52000								$2.35 \times 10^{-6}$	19.3
				4	4000			48000								$2.77 \times 10^{-6}$	22.7
				2	2000			44000								$3.28 \times 10^{-6}$	26.9
21 OCT. 3500	3000	300	3.0	1	1000	2800	65	3465	30	30000			$3.52 \times 10^{-6}$	28.9			
				2	2000			32000							$3.29 \times 10^{-6}$	26.9	
				4	5000			37000							$2.82 \times 10^{-6}$	23.1	
				6	6000			41000								$2.20 \times 10^{-6}$	18.0
				8	8000			44000								$1.97 \times 10^{-6}$	16.1
				10	10000			47000								$1.83 \times 10^{-6}$	15.0
				8	8000			52000								$1.70 \times 10^{-6}$	13.9
				6	6000			46000								$1.99 \times 10^{-6}$	14.7
				4	4000			41000								$1.97 \times 10^{-6}$	16.1
				2	2000			39000								$2.65 \times 10^{-6}$	20.1
21 OCT. 3800	3000	300	3.0	1	1000	2800	65	3465	28	28000			$2.92 \times 10^{-6}$	23.9			
				2	2000			33000							$2.39 \times 10^{-6}$	19.2	
				4	5000			38000							$2.10 \times 10^{-6}$	12.2	
				6	6000			41000								$1.89 \times 10^{-6}$	15.5
				8	8000			44000								$1.92 \times 10^{-6}$	15.8
				10	10000			46000								$1.67 \times 10^{-6}$	13.7
				8	8000			43000								$1.58 \times 10^{-6}$	12.3
				6	6000			40000								$1.63 \times 10^{-6}$	13.4
				4	4000			37000								$1.92 \times 10^{-6}$	15.8



# RECORD OF WATER PRESSURE TEST

PROJECT MATUND RIVER DEVELOPMENT LOCALITY A - DAM SITE, LEFT ABUTMENT  
 BORE HOLE No. BA - 6 - 3 GROUND WATER LEVEL 28.02m

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{2.25}{L} \times \frac{1}{r} \times \frac{1}{\log \frac{r}{r_0}}$ C min/cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/HK C/msec	LUGEON UNIT L <sub>u</sub> = Q / (L-HK) * 10 <sup>10</sup>
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm				Q' l/min	Q cm <sup>3</sup> /min				
7. OCT 1400	1700	300	30	1	1000	1550	65	2615	40	40000		6.22 x 10 <sup>-6</sup>	51.0	
				2	2000			2615	49	49000		5.51 x 10 <sup>-6</sup>	45.2	
				6	6000			5615	62	62000		4.49 x 10 <sup>-6</sup>	36.8	
				4	4000			7615	47	47000		3.69 x 10 <sup>-6</sup>	30.2	
				4	4000			5615	61	61000		4.42 x 10 <sup>-6</sup>	36.2	
				2	2000			3615	50	50000		5.63 x 10 <sup>-6</sup>	46.1	
				1	1000			2615	40	40000		6.22 x 10 <sup>-6</sup>	51.0	
8 OCT 1700	2200	300	30	1	1000	1850	65	2915	41	41000		5.72 x 10 <sup>-6</sup>	46.9	
				2	2000			3915	49	49000		4.88 x 10 <sup>-6</sup>	40.0	
				4	4000			5915	59	59000		4.06 x 10 <sup>-6</sup>	33.2	
				6	6000			7915	62	62000		3.19 x 10 <sup>-6</sup>	26.1	
				4	4000			5915	59	59000		4.06 x 10 <sup>-6</sup>	33.2	
				2	2000			3915	46	46000		5.78 x 10 <sup>-6</sup>	39.2	
				1	1000			2915	39	39000		5.44 x 10 <sup>-6</sup>	44.6	
9 OCT 2000	2300			Water was unable to be applied								0	0	0
"	2300			"								0	0	0
"	2800			"								0	0	0
14 OCT 2900	3100		30	1	1000	2000	65	3065	30	30000		3.52 x 10 <sup>-6</sup>	28.9	
				2	2000			4065	30	30000		3.10 x 10 <sup>-6</sup>	25.4	
				4	4000			6065	41	41000		2.58 x 10 <sup>-6</sup>	21.1	
				6	6000			8065	50	50000		2.40 x 10 <sup>-6</sup>	19.7	
				8	8000			10065	53	53000		2.06 x 10 <sup>-6</sup>	16.9	
				10	10000			12065	55	55000		1.80 x 10 <sup>-6</sup>	14.7	
				8	8000			10065	53	53000		2.06 x 10 <sup>-6</sup>	16.9	
				6	6000			8065	47	47000		2.26 x 10 <sup>-6</sup>	17.5	
				4	4000			6065	41	41000		2.58 x 10 <sup>-6</sup>	21.1	
				2	2000			4065	34	34000		3.10 x 10 <sup>-6</sup>	25.4	
				1	1000			3065	31	31000		3.64 x 10 <sup>-6</sup>	29.8	

## RECORD OF WATER PRESSURE TEST

PROJECT MAJURO RIVER DEVELOPMENT LOCALITY A - DAM SITE, LEFT ABUTMENT  
 BORE-HOLE No. BA - 1 - 6 GROUND WATER LEVEL - 24.0 m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>0</sub> +H <sub>g</sub> +H <sub>g</sub> cm		WATER LEAKAGE Q l/min	CALCULATING CONST $\frac{2.3 \times 10^{-4} \times L \times r^2}{\pi \times C}$ C min/cm-sec	S cm <sup>2</sup> /min	COEFFICIENT OF PERMEABILITY K-Q/HXC m/sec	LUGEON UNIT L <sub>u</sub> =Q/L-RX10 <sup>10</sup>
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm			H cm	Q cm <sup>3</sup> /min					
	5000 - 5200	300	3.0	8	2000	2500	66	1865	20	20000			$2.77 \times 10^{-5}$	6.4
				10	12000			12065	23	23000			$7.51 \times 10^{-5}$	6.2
				8	2000			1865	18	18000			$7.00 \times 10^{-5}$	5.7
				6	6000			2665	15	15000			$7.21 \times 10^{-5}$	5.9
				4	4000			2465	14	14000			$8.81 \times 10^{-5}$	7.2
				2	2000			2265	10	10000			$9.11 \times 10^{-5}$	7.5
				1	1000			2065	9	9000			$1.06 \times 10^{-4}$	8.7

# RECORD OF WATER PRESSURE TEST

PROJECT MATJNO RIVER DEVELOPMENT LOCALITY A DAM SLICE LEFT BANK ABUTMENT  
 BORE-HOLE No BA-7 (1) GROUND WATER LEVEL Below - 50 m (Base hole bottom)

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>s</sub> + H <sub>g</sub> + H <sub>h</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{1}{2} \times \frac{1}{r} \times \frac{1}{L} \times \frac{1}{\log \frac{1}{2}}$ C. min/cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/R x C. m/day	LUGEON UNIT L <sub>u</sub> = Q/L x H x T
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min				
	25.00 ~ 30.00	500	3.8	1	1.000	2750	65	3815	21.8	21800	$2.586 \times 10^{-5}$	5.71	$1.5 \times 10^{-4}$	11.4
				4	4.000			6815	31.7	31700		4.60	$1.2 \times 10^{-4}$	9.4
				7	7.000			7815	40.8	40800		4.16	$1.1 \times 10^{-4}$	8.3
				10	10.000			12815	50.2	50200		3.92	$1.1 \times 10^{-4}$	7.8
				7	7.000			9815	37.4	37400		3.81	$9.9 \times 10^{-5}$	7.6
				4	4.000			8815	25.1	25100		3.68	$9.5 \times 10^{-5}$	7.4
				1	1.000			3815	14.2	14200		3.72	$9.4 \times 10^{-5}$	7.4
	30.00 ~ 35.00			1	1.000	3250	65	4315	19.3	19300	$2.586 \times 10^{-5}$	4.47	$1.2 \times 10^{-4}$	8.9
				4	4.000			7315	25.7	25700		3.51	$9.1 \times 10^{-5}$	7.0
				7	7.000			10315	30.3	30300		2.74	$7.6 \times 10^{-5}$	5.7
				10	10.000			13315	36.1	36100		2.71	$7.0 \times 10^{-5}$	5.4
				7	7.000			10315	28.7	28700		2.78	$7.2 \times 10^{-5}$	5.6
				4	4.000			7315	20.7	20700		2.86	$7.4 \times 10^{-5}$	5.7
				1	1.000			4315	15.8	15800		3.46	$9.5 \times 10^{-5}$	7.3
	35.00 ~ 40.00			1	1.000	3750	65	4815	14.5	14500	$2.586 \times 10^{-5}$	3.01	$7.8 \times 10^{-5}$	6.0
				4	4.000			7815	19.1	19100		2.44	$6.3 \times 10^{-5}$	4.7
				7	7.000			10815	24.4	24400		2.26	$5.8 \times 10^{-5}$	4.5
				10	10.000			13815	31.6	31600		2.27	$5.7 \times 10^{-5}$	4.6
				7	7.000			10815	20.8	20800		1.92	$4.9 \times 10^{-5}$	3.8
				4	4.000			7815	15.2	15200		1.74	$5.0 \times 10^{-5}$	3.7
				1	1.000			4815	10.4	10400		2.16	$5.6 \times 10^{-5}$	4.3

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY A-DAM SITE LEFT ABUTMENT  
 BORE HOLE No. BA-7 (2) GROUND WATER LEVEL Below -50 m. (Base hole bottom)

DATE	DEPTH m	SECTION LENGTH L, m	HOLE RADIUS r, cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> , cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> , cm		TOTAL HEAD H <sub>s</sub> + H <sub>g</sub> + H <sub>g</sub> , cm	WATER LEAKAGE		CALCULATING CONST $\frac{3.14 \times r^2 \times L}{2.303} \times \frac{1}{\log \frac{H}{H_0}}$ C, m <sup>3</sup> /cm-sec	S m <sup>2</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/HX C m/sec	LUGEON UNIT L <sub>u</sub> =Q/LHXHP
				P, kg/cm <sup>2</sup>	H <sub>p</sub> , cm		Q, l/min	Q, cm <sup>3</sup> /min							
	40.00 ~ 45.00	500	3.0	1	1,000	4250	65	5315	17.4	17400	2.586 x 10 <sup>-5</sup>	3.27	8.5 x 10 <sup>-5</sup>	6.5	
				4	4,000			8315	23.5	23500		2.83	7.3 x 10 <sup>-5</sup>	5.7	
				7	7,000			11315	29.5	29500		2.61	6.7 x 10 <sup>-5</sup>	5.2	
				10	10,000			14315	35.1	35100		2.45	6.3 x 10 <sup>-5</sup>	4.9	
				7	7,000			11315	26.3	26300		2.32	6.0 x 10 <sup>-5</sup>	4.6	
				4	4,000			8315	20.3	20200		2.42	6.3 x 10 <sup>-5</sup>	4.9	
				1	1,000			5315	11.2	11200		2.11	5.4 x 10 <sup>-5</sup>	4.2	
	45.00 ~ 50.00	500	3.0	1	1,000	4750	65	5815	13.7	13700	2.586 x 10 <sup>-5</sup>	2.37	6.2 x 10 <sup>-5</sup>	4.8	
				4	4,000			8815	18.3	18300		2.08	5.4 x 10 <sup>-5</sup>	4.2	
				7	7,000			11815	23.7	23700		2.02	5.2 x 10 <sup>-5</sup>	4.0	
				10	10,000			14815	27.1	27100		1.83	4.7 x 10 <sup>-5</sup>	3.7	
				7	7,000			11815	21.0	21000		1.78	4.6 x 10 <sup>-5</sup>	3.6	
				4	4,000			8815	15.2	15200		1.72	4.5 x 10 <sup>-5</sup>	3.4	
				1	1,000			5815	9.4	9400		1.62	4.2 x 10 <sup>-5</sup>	3.2	

# RECORD OF WATER PRESSURE TEST

PROJECT MATUAN RIVER DEVELOPMENT LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA - 8 - 1 GROUND WATER LEVEL - 8.40m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE		PRESSURE GAUGE HEIGHT Hg cm	TOTAL HEAD Hp + Hs + Hg cm		WATER LEAKAGE		CALCULATING CONST $\frac{1}{2} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10}$ C min/cm-sec	g cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/HxC cm/sec	LUGEON UNIT L <sub>u</sub> =Q/L <sub>u</sub> HxM
				P kg/cm <sup>2</sup>	Hp cm	Hs cm	H cm		Q l/min	Q cm <sup>3</sup> /min						
	2.00	300	3.0	1	1000	350	400	1750	19	19000					$4.42 \times 10^{-4}$	36.2
				2	2000			2250	26	36000					$3.85 \times 10^{-4}$	31.5
				1	1000			1750	19	19000					$4.42 \times 10^{-4}$	36.2
	5.00	300	3.0	1	1000	650	400	2050	3	3000					$5.86 \times 10^{-5}$	4.9
				2	2000			3450	5	5000					$6.67 \times 10^{-5}$	5.5
				4	4000			5050	10	10000					$8.05 \times 10^{-5}$	6.6
				6	6000			7050	18	18000					$1.04 \times 10^{-4}$	8.5
				8	8000			9050	26	26000					$1.17 \times 10^{-4}$	9.6
				10	10000			11050	29	29000					$1.07 \times 10^{-4}$	8.7
	8.00	300	3.0	1	1000	800	500	2300	25	25000					$1.12 \times 10^{-4}$	9.2
				2	2000			3400	15	15000					$8.65 \times 10^{-5}$	7.1
				4	4000			5400	9	9000					$7.25 \times 10^{-5}$	5.9
				2	2000			3400	5	5000					$6.67 \times 10^{-5}$	5.5
				1	1000			2050	2	2000					$3.97 \times 10^{-5}$	3.3
	8.00	300	3.0	1	1000	800	500	2300	24	24000					$4.36 \times 10^{-4}$	35.7
				2	2000			3400	27	37000					$3.39 \times 10^{-4}$	27.8
				4	4000			5300	42	42000					$3.26 \times 10^{-4}$	26.7
				2	2000			3400	25	25000					$3.14 \times 10^{-4}$	25.7
				1	1000			2300	15	15000					$2.72 \times 10^{-4}$	22.3
	11.00	300	3.0	1	1000	800	500	2300	15	15000					$2.72 \times 10^{-4}$	22.3
				2	2000			3400	18	18000					$2.26 \times 10^{-4}$	18.5
				4	4000			5300	29	29000					$3.03 \times 10^{-4}$	24.8
				2	2000			3400	27	27000					$3.39 \times 10^{-4}$	27.8
				1	1000			2300	17	17000					$3.09 \times 10^{-4}$	25.3
	14.00	300	3.0	1	1000	800	400	2200	13	13000					$2.31 \times 10^{-4}$	19.3
				2	2000			3400	23	23000					$2.89 \times 10^{-4}$	23.7
				4	4000			5400	39	39000					$3.03 \times 10^{-4}$	24.8
				2	2000			3400	23	23000					$2.89 \times 10^{-4}$	23.7

# RECORD OF WATER PRESSURE TEST

PROJECT MATLAB RIVER DEVELOPMENT LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA - 2 - 2 GROUND WATER LEVEL - 2000

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> H cm	WATER LEAKAGE		CALCULATING CONST. $\frac{1.3}{17} \times \frac{1}{R} \times \frac{1}{L} \times \frac{1}{\log \frac{L}{r}}$ C mlb/cm sec	Q H cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/H x C ml/sec	LUGEON UNIT L <sub>u</sub> = Q / L x H x K
				PRESSURE P kg/cm <sup>2</sup>	HEAD H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min				
	1400 - 1700	300	30	1	1000	840	400	2240	10	10000			$1.82 \times 10^{-4}$	14.9
	1700 - 2000	300	30	1	1000	840	400	2240	15	15000			$2.72 \times 10^{-4}$	22.3
				2	2000			3240	27	27000			$3.37 \times 10^{-4}$	27.8
				4	4000			5240	39	39000			$3.63 \times 10^{-4}$	29.8
				2	2000			3240	24	24000			$3.01 \times 10^{-4}$	24.7
				1	1000			2240	13	13000			$2.36 \times 10^{-4}$	19.3
	2000 - 2300	300	30	1	1000	840	400	2240	13	13000			$2.36 \times 10^{-4}$	19.3
				2	2000			3240	17	17000			$2.13 \times 10^{-4}$	17.5
				4	4000			5240	27	27000			$2.10 \times 10^{-4}$	17.2
				6	6000			7240	32	32000			$1.80 \times 10^{-4}$	14.7
				8	8000			9240	37	37000			$1.63 \times 10^{-4}$	13.3
				6	6000			7240	30	30000			$1.69 \times 10^{-4}$	13.8
				4	4000			5240	24	24000			$1.86 \times 10^{-4}$	15.3
				2	2000			3240	16	16000			$2.01 \times 10^{-4}$	16.5
				1	1000			2240	11	11000			$2.00 \times 10^{-4}$	16.4
	2300 - 2600	300	30	1	1000	840	400	2240	22	22000			$4.00 \times 10^{-4}$	32.7
				2	2000			3240	23	23000			$2.89 \times 10^{-4}$	23.7
				4	4000			5240	25	25000			$1.92 \times 10^{-4}$	15.9
				6	6000			7240	32	32000			$1.80 \times 10^{-4}$	14.7
				8	8000			9240	35	35000			$1.54 \times 10^{-4}$	12.6
				10	10000			11240	38	38000			$1.38 \times 10^{-4}$	11.3
				8	8000			9240	34	34000			$1.50 \times 10^{-4}$	12.3
				6	6000			7240	25	25000			$1.40 \times 10^{-4}$	11.5
				4	4000			5240	18	18000			$1.40 \times 10^{-4}$	11.5
				2	2000			3240	13	13000			$1.63 \times 10^{-4}$	13.4
				1	1000			2240	9	9000			$1.63 \times 10^{-4}$	13.4
	2600 - 2900	300	30	1	1000	840	400	2240	12	12000			$2.18 \times 10^{-4}$	17.9
				2	2000			3240	13	13000			$1.63 \times 10^{-4}$	13.4

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA-P-3 GROUND WATER LEVEL - P. 80m

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD		WATER LEAKAGE		CALCULATING CONST.	Q/H	COEFFICIENT OF PERMEABILITY	LUGEON UNIT
				PRESSURE	HEAD			H <sub>p</sub>	H <sub>h</sub>	Q	Q'				
	2000 - 2200	300	3.0	4	4000	840	400	5240	19	19000			$1.92 \times 10^{-6}$	12.1	
				6	6000			2840	22	28000			$1.35 \times 10^{-6}$	11.1	
				3	3000			2840	21	31000			$1.37 \times 10^{-6}$	11.2	
				6	6000			2360	23	23000			$1.29 \times 10^{-6}$	10.6	
				4	4000			5240	16	16000			$1.25 \times 10^{-6}$	10.2	
				2	2000			3240	14	14000			$1.96 \times 10^{-6}$	14.4	
				1	1000			2240	11	11000			$2.00 \times 10^{-6}$	16.4	
	2800 - 3200	300	3.0	1	1000	840	400	2240	12	12000			$2.18 \times 10^{-6}$	17.9	
				2	2000			3240	14	14000			$1.96 \times 10^{-6}$	14.4	
				4	4000			5240	18	18000			$1.40 \times 10^{-6}$	11.5	
				6	6000			2240	20	20000			$1.12 \times 10^{-6}$	9.2	
				3	3000			2240	26	26000			$1.14 \times 10^{-6}$	9.4	
				10	10000			11240	30	30000			$1.09 \times 10^{-6}$	8.9	
				3	3000			9240	25	25000			$1.10 \times 10^{-6}$	9.0	
				6	6000			2240	21	21000			$1.18 \times 10^{-6}$	9.7	
				4	4000			5240	17	17000			$1.32 \times 10^{-6}$	10.8	
				2	2000			3240	13	13000			$1.63 \times 10^{-6}$	13.4	
				1	1000			2240	11	11000			$2.00 \times 10^{-6}$	16.4	
	3200 - 3500	300	3.0	1	1000	840	400	2240	12	22000			$2.18 \times 10^{-6}$	17.9	
				2	2000			3240	14	14000			$1.96 \times 10^{-6}$	14.4	
				4	4000			5240	16	16000			$1.34 \times 10^{-6}$	10.2	
				6	6000			2240	19	19000			$1.07 \times 10^{-6}$	8.7	
				3	3000			2240	22	22000			$9.68 \times 10^{-7}$	7.9	
				6	6000			2240	18	18000			$1.01 \times 10^{-6}$	8.3	
				4	4000			5240	15	15000			$1.16 \times 10^{-6}$	9.5	
				2	2000			3240	13	13000			$1.63 \times 10^{-6}$	13.4	
				1	1000			2240	11	11000			$2.00 \times 10^{-6}$	16.4	
	3500 - 3800	300	3.0	1	1000	840	400	2240	14	14000			$2.54 \times 10^{-6}$	26.7	
				2	2000			3240	16	16000			$2.01 \times 10^{-6}$	16.5	

# RECORD OF WATER PRESSURE TEST

PROJECT MAJUNO RIVER DEVELOPMENT LOCALITY A - DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BA - 8 - 14 GROUND WATER LEVEL - 8.00 m.

DATE	DEPTH m	SECTION LENGTH L, cm	HOLE RADIUS r, cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> , cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> , cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub>		WATER LEAKAGE Q, cm <sup>3</sup> /min	CALCULATING CONST $\frac{L}{4r^2} \times \frac{L}{4r^2} \times \frac{1}{\log \frac{L}{r}}$ C, min/cm-sec	K cm/min	COEFFICIENT OF PERMEABILITY K=Q/HXC, cm/sec	LUGEON UNIT L <sub>u</sub> =Q/L-HX10 <sup>10</sup>
				PRESSURE P, kg/cm <sup>2</sup>	HEAD H <sub>p</sub> , cm			H, cm	Q, l/min					
	35.00 - 38.00	300	30	4	4000	840	400	5240	20	30000			1.55 x 10 <sup>-4</sup>	12.7
				6	6000			7240	23	30000			1.29 x 10 <sup>-4</sup>	10.6
				8	8000			9240	28	28000			1.23 x 10 <sup>-4</sup>	10.1
				10	10000			11240	36	36000			1.30 x 10 <sup>-4</sup>	10.7
				8	8000			9240	28	28000			1.23 x 10 <sup>-4</sup>	10.1
				6	6000			7240	24	25000			1.35 x 10 <sup>-4</sup>	11.1
				4	4000			5240	19	19000			1.48 x 10 <sup>-4</sup>	12.1
				2	2000			3240	15	15000			1.88 x 10 <sup>-4</sup>	15.4
				1	1000			2240	12	12000			2.18 x 10 <sup>-4</sup>	17.9
	38.00 - 41.00			Water was unable to be injected										
	41.00 - 44.00	300	30	1	1000	840	400	2240	13	13000			2.36 x 10 <sup>-4</sup>	19.3
				2	2000			3240	17	19000			2.13 x 10 <sup>-4</sup>	17.5
				4	4000			5240	23	23000			1.79 x 10 <sup>-4</sup>	14.6
				6	6000			7240	28	20000			1.57 x 10 <sup>-4</sup>	12.9
				8	8000			9240	31	31000			1.37 x 10 <sup>-4</sup>	11.2
				6	6000			7240	27	27000			1.52 x 10 <sup>-4</sup>	12.4
				4	4000			5240	22	22000			1.71 x 10 <sup>-4</sup>	14.0
				2	2000			3240	16	16000			2.01 x 10 <sup>-4</sup>	16.5
				1	1000			2240	12	12000			2.18 x 10 <sup>-4</sup>	17.9
	45.00 - 48.00			Water was unable to be injected										
	48.00 - 51.00	300	30	1	1000	840	400	2240	2	2000			3.63 x 10 <sup>-5</sup>	3.0
				2	2000			3240	3	3000			3.77 x 10 <sup>-5</sup>	3.1
				4	4000			5240	8	8000			6.21 x 10 <sup>-5</sup>	5.1
				6	6000			7240	12	12000			6.74 x 10 <sup>-5</sup>	5.5
				8	8000			9240	17	17000			7.48 x 10 <sup>-5</sup>	6.1
				10	10000			11240	21	21000			8.60 x 10 <sup>-5</sup>	6.2
				8	8000			9240	16	16000			8.68 x 10 <sup>-5</sup>	6.8
				6	6000			7240	12	12000			6.74 x 10 <sup>-5</sup>	5.5
				4	4000			5240	9	9000			6.99 x 10 <sup>-5</sup>	5.9
				2	2000			3240	6	6000			7.53 x 10 <sup>-5</sup>	6.2
				1	1000			2240	3	3000			8.46 x 10 <sup>-5</sup>	6.5



# RECORD OF WATER PRESSURE TEST

PROJECT: MALINDO RIVER DEVELOPMENT LOCALITY: A - DAM SITE, RIVER SIDE  
 BORE-HOLE No: BA-9 GROUND WATER LEVEL: 262 ~ 282 m

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD	WATER LEAKAGE		CALCULATING CONST	H	COEFFICIENT OF PERMEABILITY	LUGEON UNIT
				P	H <sub>p</sub>				Q	Q'				
	m	m	cm	kg/cm <sup>2</sup>	cm	cm	cm	cm	cm <sup>3</sup> /min	cm <sup>3</sup> /min	min/cm sec	cm/min	cm/sec	cm
	10.00 - 15.00	500	3.0	1	1000	262	52	1776	20	2000			$2.02 \times 10^{-5}$	2.2
				4	4000			4726	11.3	1100			$6.39 \times 10^{-5}$	4.7
				7	7000			7796	9.9	900			$3.44 \times 10^{-5}$	2.5
				10	10000			10726	10.2	10200			$2.56 \times 10^{-5}$	1.9
				7	7000			7796	6.6	600			$2.30 \times 10^{-5}$	1.7
				4	4000			4726	2.1	2100			$1.19 \times 10^{-5}$	0.9
				1	1000			1726	1.0	1000			$1.51 \times 10^{-5}$	1.1
	15.00 - 20.00	500	3.0	1	1000	262	34	1726	330	3000			$4.98 \times 10^{-6}$	36.7
				3	3000			3726	516	5100			$3.69 \times 10^{-6}$	27.2
	20.00 - 25.00	500	3.0	1	1000	285	34	1919	49	4700			$6.92 \times 10^{-5}$	5.1
				4	4000			4919	23.9	2300			$1.32 \times 10^{-6}$	9.7
				7	7000			7919	42.7	42700			$1.46 \times 10^{-6}$	10.8
				10	10000			10919	52.6	52600			$1.31 \times 10^{-6}$	8.6
				7	7000			7919	33.6	3300			$1.15 \times 10^{-6}$	8.5
				4	4000			4919	12.8	12800			$9.59 \times 10^{-5}$	7.1
				1	1000			1919	4.5	500			$2.06 \times 10^{-6}$	0.5
	25.00 - 30.00	500	3.0	1	1000	235	52	1869	0.4	400			$5.80 \times 10^{-6}$	4.4
				4	4000			4869	4.6	4600			$2.56 \times 10^{-5}$	1.9
				7	7000			7869	10.7	10700			$3.69 \times 10^{-5}$	2.7
				10	10000			10869	13.9	13900			$3.49 \times 10^{-5}$	2.6
				7	7000			7869	9.8	7800			$3.38 \times 10^{-5}$	2.5
				4	4000			4869	3.0	3000			$1.69 \times 10^{-5}$	1.2
				1	1000			1869	0	0				
	30.00 - 35.00	500	3.0	1	1000	770	34	1204	50.1	47100			$6.78 \times 10^{-4}$	50.0
				1	1000			1204	27.7	27700			$2.50 \times 10^{-4}$	62.7



# RECORD OF WATER PRESSURE TEST

PROJECT MATUNDO RIVER DEVELOPMENT LOCALITY δ - DAM SITE NEAR RIVER BED  
 BORE-HOLE No. B 2 - 2 - 1 GROUND WATER LEVEL -132m - 137m

DATE	DEPTH m - "	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>g</sub> + H <sub>0</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{2.3}{L} \times \frac{1}{r} \times \frac{1}{\log \frac{r}{r_0}}$	Q cm <sup>3</sup> /min	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/HK C/msec	LUGION UNIT L = Q/L HKMP
				PRESSURE P kg/cm <sup>2</sup>	HEAD H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min					
	255 - 255	300	3	1	1000	132	225	1407	120	12000		120	12000	$3.87 \times 10^{-6}$	28.4
				2	1000			2007	156	15600		156	15600	$2.97 \times 10^{-6}$	20.2
				4	2000			2407	120	12000		120	12000	$1.11 \times 10^{-6}$	8.1
				6	1000			1807	85	8500		85	8500	$5.80 \times 10^{-6}$	4.8
				8	8000			8807	128	12800		128	12800	$6.19 \times 10^{-6}$	5.1
				10	10000			10807	140	14000		140	14000	$1.72 \times 10^{-6}$	14.1
				8	8000			8807	125	12500		125	12500	$2.29 \times 10^{-6}$	18.2
				6	6000			6807	120	12000		120	12000	$2.73 \times 10^{-6}$	22.4
				4	4000			4807	120	12000		120	12000	$2.85 \times 10^{-6}$	24.2
				2	2000			2807	118	11800		118	11800	$8.86 \times 10^{-6}$	16.6
				1	1000			1807	110	11000		110	11000	$5.78 \times 10^{-6}$	47.0
	1255 - 1255	300	3	1	1000	132	225	1407	60	6000		60	6000	$1.73 \times 10^{-6}$	14.2
				2	2000			2407	80	8000		80	8000	$1.35 \times 10^{-6}$	11.1
				4	4000			4807	69	6900		69	6900	$6.37 \times 10^{-6}$	5.2
				8	8000			8807	142	14200		142	14200	$6.87 \times 10^{-6}$	5.6
				10	10000			10807	270	27000		270	27000	$1.21 \times 10^{-6}$	8.9
				8	8000			8807	240	24000		240	24000	$1.85 \times 10^{-6}$	11.9
				6	6000			6807	267	26700		267	26700	$1.63 \times 10^{-6}$	13.8
				4	4000			4807	200	20000		200	20000	$1.85 \times 10^{-6}$	15.1
				2	2000			2807	152	15200		152	15200	$2.57 \times 10^{-6}$	21.1
				1	1000			1807	140	14000		140	14000	$4.05 \times 10^{-6}$	33.2
	1750 - 2050	300	3	1	1000	132	227	1429	146	14600		146	14600	$4.16 \times 10^{-6}$	37.1
				2	2000			2429	168	16800		168	16800	$2.25 \times 10^{-6}$	22.5
				4	4000			4429	151	15100		151	15100	$1.39 \times 10^{-6}$	11.8
				6	6000			6429	201	20100		201	20100	$1.27 \times 10^{-6}$	10.4
				8	8000			8429	303	30300		303	30300	$1.96 \times 10^{-6}$	12.0
				10	10000			10429	309	30900		309	30900	$1.21 \times 10^{-6}$	9.9
				8	8000			8429	210	21000		210	21000	$1.01 \times 10^{-6}$	8.3
				6	6000			6429	125	12500		125	12500	$1.09 \times 10^{-6}$	9.0
				4	4000			4429	166	16600		166	16600	$1.52 \times 10^{-6}$	12.5

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY B - DAM SITE, NEAR RIVERBED  
 BORE-HOLE No. BB - 2 GROUND WATER LEVEL

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD	WATER LEAKAGE		CALCULATING CONST	Q	COEFFICIENT OF PERMEABILITY	LUGEON UNIT
				P	HP				Q	Q				
		L	r	kg/cm <sup>2</sup>	cm	H <sub>s</sub>	H <sub>g</sub>	H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub>	l/min	cm <sup>3</sup> /min	$\frac{1}{2} \times \frac{1}{40} \times \frac{1}{100} \times \frac{1}{100}$	cm <sup>3</sup> /min	K = Q/HK x 10 <sup>-6</sup>	L <sub>u</sub> = Q / (L x K) x 10 <sup>6</sup>
	17.40 - 21.40	300	3	2	3000	132	297	2829	120	17000			2.85 x 10 <sup>-6</sup>	23.3
				1	1000			1829	15.0	4100			4.27 x 10 <sup>-6</sup>	35.0
	20.40 - 23.40	300	3	1	1000	132	297	1829	28.9	28900			7.07 x 10 <sup>-6</sup>	58.1
				2	2000			2829	31.6	31600			5.29 x 10 <sup>-6</sup>	43.4
				3	3000			2829	38.5	38500			3.50 x 10 <sup>-6</sup>	29.0
				6	6000			2829	45.0	45000			2.85 x 10 <sup>-6</sup>	23.3
				8	8000			2829	55.4	55400			2.19 x 10 <sup>-6</sup>	18.0
				10	10000			10829	65.7	65700			1.78 x 10 <sup>-6</sup>	14.6
				8	8000			8829	55.5	55500			1.66 x 10 <sup>-6</sup>	13.6
				6	6000			6829	22.6	22600			1.75 x 10 <sup>-6</sup>	14.3
				4	4000			4829	26.8	26800			2.12 x 10 <sup>-6</sup>	18.4
				2	2000			2829	27.3	27300			4.57 x 10 <sup>-6</sup>	37.5
				1	1000			1829	30.0	30000			8.54 x 10 <sup>-6</sup>	70.0
	23.50 - 26.50	300	3	1	1000	132	215	1547	15.0	15000			4.53 x 10 <sup>-6</sup>	37.1
				2	2000			2347	21.0	21000			3.64 x 10 <sup>-6</sup>	29.8
				3	3000			4347	28.5	28500			2.29 x 10 <sup>-6</sup>	18.8
				6	6000			6347	31.0	31000			1.99 x 10 <sup>-6</sup>	16.3
				8	8000			8347	38.1	38100			2.27 x 10 <sup>-6</sup>	18.6
				10	10000			10347	38.0	38000			1.97 x 10 <sup>-6</sup>	16.1
				8	8000			8347	39.0	39000			1.90 x 10 <sup>-6</sup>	15.6
				6	6000			6347	31.0	31000			1.92 x 10 <sup>-6</sup>	15.8
				4	4000			4347	25.0	4500			2.34 x 10 <sup>-6</sup>	19.2
				2	2000			2347	21.0	2000			3.64 x 10 <sup>-6</sup>	29.8
				1	1000			1347	28.9	17000			5.25 x 10 <sup>-6</sup>	43.1
	26.50 - 28.50	300	3	1	1000	137	215	1352	25.0	36000			7.52 x 10 <sup>-6</sup>	61.6
				2	2000			2352	31.0	36000			6.23 x 10 <sup>-6</sup>	51.0
				4	4000			4352	45.0	54000			4.21 x 10 <sup>-6</sup>	34.5
				6	6000			6352	45.0	45000			2.88 x 10 <sup>-6</sup>	23.6
				8	8000			8352	45.0	45000			2.19 x 10 <sup>-6</sup>	18.0

# RECORD OF WATER PRESSURE TEST

PROJECT MALINDO RIVER DEVELOPMENT LOCALITY B - DAM SITE, NEAR RIVERBED  
 BORE-HOLE No. BB - 2 - 3 GROUND WATER LEVEL

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD		WATER LEAKAGE	CALCULATING CONST	Q	COEFFICIENT OF PERMEABILITY	LUCEON UNIT
				P	H <sub>p</sub>			H <sub>s</sub>	H <sub>g</sub>					
	26.50 - 28.00	300	3	10	10000	137	215	10352	510	52000			$2.80 \times 10^{-4}$	16.4
				8	8000			8252	420	47000			$3.29 \times 10^{-4}$	18.8
				6	6000			6352	420	42000			$3.69 \times 10^{-4}$	22.0
				4	4000			4352	260	35000			$3.27 \times 10^{-4}$	24.8
				2	2000			2352	260	20000			$4.50 \times 10^{-4}$	36.8
				1	1000			1352	200	20000			$6.02 \times 10^{-4}$	59.3
	29.25 - 32.25	300	3	1	1000	137	215	1352	0	0			0	0
				2	2000			2352	20	2000			$3.46 \times 10^{-5}$	2.8
				4	4000			4352	27	2700			$3.52 \times 10^{-5}$	2.1
				6	6000			6352	20	2000			$5.48 \times 10^{-5}$	3.7
				8	8000			8352	42	4200			$2.45 \times 10^{-5}$	1.7
				10	10000			10352	80	8000			$3.14 \times 10^{-5}$	2.6
				8	8000			8352	63	6300			$3.07 \times 10^{-5}$	2.5
				6	6000			6352	50	5000			$3.20 \times 10^{-5}$	2.6
				4	4000			4352	20	2000			$4.87 \times 10^{-5}$	1.5
				2	2000			2352	10	1000			$1.73 \times 10^{-5}$	1.4
				1	1000			1352	0	0			0	0
	35.25 - 38.25	300	3	1	1000	137	215	1352	0	0			0	0
				2	2000			2352	0	0			0	0
				4	4000			4352	0	0			0	0
				6	6000			6352	20	2000			$1.28 \times 10^{-4}$	1.1
				8	8000			8352	50	5000			$2.44 \times 10^{-4}$	2.0
				10	10000			10352	50	5000			$1.96 \times 10^{-4}$	1.6
	38.25 - 41.25	300	3	1	1000	137	215	1352	0	0			0	0
				2	2000			2352	0	0			0	0
				4	4000			4352	0	0			0	0
				6	6000			6352	0	0			0	0
				8	8000			8352	0	0			0	0
				10	10000			10352	0	0			0	0

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY 2 - DAM SITE NEAR RIVERBED  
 BORE-HOLE No. BA - 3 - 4 GROUND WATER LEVEL

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>0</sub> + H <sub>g</sub> + H <sub>g</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{1.3}{3r} \times \frac{L}{60} \times \frac{1}{\log r}$	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/Wx C m/sec	LUGEON UNIT L <sub>u</sub> =Q/LxNxt <sup>2</sup>
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min				
	4125 - 4125	300	3	8	8000	137	245	8252	0	0			0	0
				6	6000			6252	0	0			0	0
				8	8000			8252	0	0			0	0
				3	2000			2252	0	0			0	0
				1	1000			1252	0	0			0	0
	4125 - 4125	300	3	1	1000	137	245	1352	0	0			0	0
				3	3000			2352	0	0			0	0
				4	4000			4252	20	2000			$1.87 \times 10^{-5}$	1.5
				6	6000			6252	40	4000			$2.26 \times 10^{-5}$	1.5
				8	8000			8252	80	8000			$1.95 \times 10^{-5}$	23
				10	10000			10252	160	16000			$1.22 \times 10^{-5}$	100
				8	8000			8252	300	30000			$1.86 \times 10^{-5}$	120
				6	6000			6252	240	24000			$1.56 \times 10^{-5}$	125
				3	2000			2252	150	15000			$1.40 \times 10^{-5}$	11.5
				1	1000			1252	0	0			0	0
	4425 - 4425	300	3	1	1000	137	245	1352	0	0			0	0
				2	2000			2252	0	0			0	0
				4	4000			4252	0	0			0	0
				6	6000			6252	0	0			0	0
				8	8000			8252	26	2600			$3.20 \times 10^{-5}$	30
				10	10000			10252	0	0			0	0
				6	6000			6252	0	0			0	0
				4	4000			4252	0	0			0	0
				2	2000			2252	0	0			0	0
				1	1000			1252	0	0			0	0

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY B - DAM SITE, NEAR RIVERBED

BORE-HOLE No. BB - 2 - 5 GROUND WATER LEVEL

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD	WATER LEAKAGE		CALCULATING CONST	H	COEFFICIENT OF PERMEABILITY	LUGEON UNIT
				P	H <sub>p</sub>				H <sub>s</sub>	H <sub>p</sub> + H <sub>g</sub> + H <sub>s</sub>				
	m	L	r	kg/cm <sup>2</sup>	cm	cm	cm	cm	cm <sup>3</sup> /min	cm <sup>3</sup> /min	$\frac{1.3 \times 10^{-4} \times L \times H}{r^2 \times Q}$	cm <sup>2</sup> /min	$K = Q/H \times C$	$L_u = Q/L \times H \times 10^4$
	4725 - 50.25	300	3	1	1000	137	345	2352	1200	1200			$5.11 \times 10^{-4}$	419
				2	2000			2352	23000	2300			$3.98 \times 10^{-4}$	32.6
				4	4000			2352	22000	330			$3.08 \times 10^{-4}$	25.3
				6	6000			2352	40300	40.2			$2.58 \times 10^{-4}$	21.1
				8	8000			2352	90000	24.0			$2.24 \times 10^{-4}$	18.4
				10	10000			2352	50000	14.8			$1.98 \times 10^{-4}$	16.2
				8	8000			2352	43000	22.0			$2.34 \times 10^{-4}$	19.2
				6	6000			2352	22500	22.5			$2.72 \times 10^{-4}$	22.3
				4	4000			2352	25000	25.1			$3.28 \times 10^{-4}$	26.9
				2	2000			2352	27500	27.5			$4.76 \times 10^{-4}$	39.0
				1	1000			2352	12000	12.0			$5.11 \times 10^{-4}$	419

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNG RIVER DEVELOPMENT LOCALITY B - DAM SITE NEAR RIVERBED  
 BORE HOLE No. BA - 3 - 1 GROUND WATER LEVEL - 163.8 ~ - 150.2

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>0</sub> + H <sub>g</sub> + H <sub>g</sub>		WATER LEAKAGE Q ml/min	CALCULATING CONST $\frac{1.1 \times 10^{-4} \times L \times r}{r^2} \times C$ C ml/cm-sec	Q ml/min	COEFFICIENT OF PERMEABILITY K=Q/HXC ml/sec	LUGEON UNIT L <sub>u</sub> =Q/L HXK*
				HEAD H <sub>p</sub> cm	P kg/cm <sup>2</sup>			H <sub>p</sub> cm	H <sub>g</sub> cm					
	20	200	3	1	1000	163	190	1353	3660				$1.51 \times 10^{-3}$	135.3
				2	2000			2353	45000				$1.06 \times 10^{-3}$	95.6
	50	500	3	1	1000	157	190	1387	36700				$2.39 \times 10^{-4}$	54.5
				2	2000			2387	48500				$5.14 \times 10^{-6}$	37.9
				4	4000			4387	50000				$3.12 \times 10^{-6}$	23.0
	100	300	3	1	1000	157	190	1387	36000				$1.10 \times 10^{-4}$	89.8
				2	2000			2387	49600				$8.60 \times 10^{-6}$	70.4
				6	6000			6387	48500				$2.98 \times 10^{-6}$	24.4
				8	8000			8387	48600				$2.00 \times 10^{-6}$	16.4
				10	10000			10387	47300				$2.02 \times 10^{-6}$	16.5
				8	8000			8387	31700				$1.55 \times 10^{-6}$	12.7
				6	6000			6387	17300				$1.11 \times 10^{-6}$	9.1
				4	4000			4387	28800				$1.85 \times 10^{-6}$	16.0
				2	2000			2387	16000				$2.77 \times 10^{-6}$	22.7
				1	1000			1387	16000				$4.23 \times 10^{-6}$	39.6
	120	300	3	1	1000	165	190	1395	31900				$1.06 \times 10^{-3}$	86.7
				2	2000			2395	49000				$8.50 \times 10^{-4}$	69.7
				4	4000			4395	43500				$4.07 \times 10^{-4}$	33.4
				6	6000			6395	38100				$3.09 \times 10^{-4}$	24.3
				8	8000			8395	46900				$2.29 \times 10^{-4}$	18.7
				10	10000			10395	44000				$1.73 \times 10^{-4}$	14.3
				8	8000			8395	39000				$1.92 \times 10^{-4}$	15.7
				6	6000			6395	30300				$1.94 \times 10^{-4}$	15.9
				4	4000			4395	30000				$2.81 \times 10^{-4}$	23.0
				2	2000			2395	28300				$4.91 \times 10^{-4}$	40.2
				1	1000			1395	27000				$8.16 \times 10^{-4}$	66.9



# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY B - DAM SITE NEAR RIVERBED  
 BORE-HOLE No. BB - 3 - 2 GROUND WATER LEVEL

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub>		WATER LEAKAGE Q l/min	CALCULATING CONST C ml/s/cm-sec	q cm <sup>2</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/HK C/sec	LUGEON UNIT L <sub>s</sub> = Q/L-HKBP
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm			H <sub>p</sub> cm	H <sub>g</sub> cm					
	11.0 - 19.0	300	3	1	1000	150	190	340	60	6000			$6.2 \times 10^{-6}$	14.9
				2	2000			2300	20	2000			$3.48 \times 10^{-6}$	2.8
	19.0 - 22.0								Water not available				0	0
	22.0 - 25.0								to be rejected				0	0
	25.0 - 27.0												0	0
	27.0 - 30.0	300	3	1	1000	150	190	340	234	23000			$7.10 \times 10^{-6}$	53.2
				2	2000			2300	210	33000			$5.74 \times 10^{-6}$	47.0
				4	4000			4300	120	22000			$3.94 \times 10^{-6}$	32.3
				6	6000			6300	80	15000			$2.82 \times 10^{-6}$	23.1
				8	8000			8300	60	11000			$2.24 \times 10^{-6}$	18.4
				10	10000			11300	57	8700			$1.80 \times 10^{-6}$	14.7
				8	8000			8300	51.6	6600			$2.03 \times 10^{-6}$	16.6
				6	6000			6300	38.1	2800			$1.80 \times 10^{-6}$	14.8
				5	5000			5300	31	3600			$3.20 \times 10^{-6}$	26.2
				2	2000			2300	22	2200			$3.96 \times 10^{-6}$	32.5
				1	1000			1300	21	2200			$6.71 \times 10^{-6}$	53.0

# RECORD OF WATER PRESSURE TEST

PROJECT MATUND RIVER DEVELOPMENT LOCALITY B AM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. B0-5-1 GROUND WATER LEVEL \_\_\_\_\_

DATE	DEPTH m -	SECTION LENGTH L - m	HOLE RADIUS r - cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> - cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> - cm	TOTAL HEAD		WATER LEAKAGE Q - m <sup>3</sup> /min	CALCULATING CONST C - min/m <sup>3</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/HK m/sec	LUGEON UNIT L <sub>u</sub> = Q/LHK m <sup>3</sup>
				P - kg/cm <sup>2</sup>	H <sub>p</sub> - cm			H <sub>p</sub> + H <sub>g</sub> + H <sub>s</sub>	H - cm					
	20.00 - 25.00	500	3.7	1	1000	2250	80	3330	42.6	42600			3.33 x 10 <sup>-6</sup>	25.6
				4	4000			6330	67.7	67700			2.98 x 10 <sup>-6</sup>	24.4
				7	7000			9330	90.8	90800			2.53 x 10 <sup>-6</sup>	19.5
				10	10000			12330	125.7	125700			2.65 x 10 <sup>-6</sup>	20.4
				7	7000			9330	92.6	92600			2.72 x 10 <sup>-6</sup>	20.9
				4	4000			6330	71.2	71200			2.95 x 10 <sup>-6</sup>	22.7
				1	1000			3330	44.9	44900			3.51 x 10 <sup>-6</sup>	27.0
	25.00 - 30.00	500	3.7	1	1000	2700	80	2880	2.6	2600			1.77 x 10 <sup>-5</sup>	1.4
				4	4000			6830	4.2	4200			1.83 x 10 <sup>-5</sup>	1.4
				7	7000			9830	7.9	7900			2.09 x 10 <sup>-5</sup>	1.6
				10	10000			12830	11.9	11900			2.41 x 10 <sup>-5</sup>	1.9
				7	7000			9830	7.9	7900			2.09 x 10 <sup>-5</sup>	1.6
				4	4000			6830	5.0	5000			1.90 x 10 <sup>-5</sup>	1.5
				1	1000			3830	3.3	3300			2.24 x 10 <sup>-5</sup>	1.7
	30.00 - 35.00	500	2.7	1	1000	3250	80	3430	2.3	2300			1.36 x 10 <sup>-4</sup>	9.8
				4	4000			2830	3.1	3100			1.36 x 10 <sup>-4</sup>	9.9
				7	7000			10330	5.5	5500			1.43 x 10 <sup>-4</sup>	10.4
				10	10000			13330	7.4	7400			1.48 x 10 <sup>-4</sup>	10.7
				7	7000			10330	5.2	5200			1.56 x 10 <sup>-4</sup>	11.3
				4	4000			7330	3.7	3700			1.51 x 10 <sup>-4</sup>	10.9
				1	1000			4330	2.5	2500			1.60 x 10 <sup>-4</sup>	11.6
	35.00 - 40.00	500	2.7	1	1000	3250	80	3430	3.5	3500			2.02 x 10 <sup>-4</sup>	14.6
				4	4000			2830	5.2	5200			2.10 x 10 <sup>-4</sup>	15.2
				7	7000			10330	7.5	7500			2.01 x 10 <sup>-4</sup>	14.5
				10	10000			13330	9.3	9300			1.87 x 10 <sup>-4</sup>	13.5
				7	7000			10330	8.9	8900			2.09 x 10 <sup>-4</sup>	15.1
				4	4000			7330	6.7	6700			2.18 x 10 <sup>-4</sup>	15.8
				1	1000			4330	4.5	4500			2.32 x 10 <sup>-4</sup>	17.2

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY B-DAM SITE RIGHT ABUTMENT  
 BORE-HOLE No. BA-S-3 GROUND WATER LEVEL

DATE	DEPTH m	SECTION LENGTH L, m	HOLE RADIUS r, m	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> , cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> , cm	TOTAL HEAD H <sub>0</sub> + H <sub>g</sub> + H <sub>z</sub>		WATER LEAKAGE		CALCULATING CONST $\frac{L \times 10^4}{\pi r^2} \times \frac{1}{C} \times \log \frac{L}{r}$ C, min/cm-sec	R	COEFFICIENT OF PERMEABILITY E = Q/N x C, cm/sec	LUGEON UNIT L <sub>u</sub> = Q / L x H x R
				P, kg/cm <sup>2</sup>	H <sub>p</sub> , cm			H	cm	Q, l/min	Q, cm <sup>3</sup> /min				
	40.00	500	2.7	1	1000	4250	80	5330	39.3	39300			$2.06 \times 10^{-4}$	14.7	
				4	4000			8330	62.1	62100			$2.06 \times 10^{-4}$	14.9	
				7	7000			11330	82.7	82700			$2.01 \times 10^{-4}$	14.4	
				10	10000			14330	98.2	98200			$1.90 \times 10^{-4}$	13.7	
				7	7000			11330	82.3	82300			$2.01 \times 10^{-4}$	14.4	
				4	4000			8330	62.5	62500			$2.11 \times 10^{-4}$	15.2	
				1	1000			5330	42.3	42300			$2.09 \times 10^{-4}$	15.1	
	45.00	500	2.7	1	1000	5750	80	5830	45.8	45800			$1.97 \times 10^{-4}$	14.2	
				4	4000			8830	58.2	88200			$1.82 \times 10^{-4}$	13.2	
				7	7000			11830	85.3	85300			$2.00 \times 10^{-4}$	14.4	
				10	10000			14830	105.8	105800			$1.89 \times 10^{-4}$	13.7	
				7	7000			11830	82.5	82500			$2.05 \times 10^{-4}$	14.8	
				4	4000			8830	62.3	62300			$1.98 \times 10^{-4}$	14.3	
				1	1000			5830	45.8	45800			$2.18 \times 10^{-4}$	15.6	

# RECORD OF WATER PRESSURE TEST

PROJECT MATUND RIVER DEVELOPMENT LOCALITY B-DAM SITE, RIGHT ABUTMENT  
 BORE-HOLE No. BB-6-1 GROUND WATER LEVEL - 12.5 m

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE		PRESSURE GAUGE HEIGHT Hg cm	TOTAL HEAD Hp + Hs + Hg cm		WATER LEAKAGE		CALCULATING CONST $\frac{L}{r} \times \frac{1}{H} \times \frac{1}{\log \frac{L}{r}}$ C min/cmsec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K=Q/HsC m/sec	LUGEON UNIT Lu=Q/L-HsIM
				P kg/cm <sup>2</sup>	Hp cm	Hs cm	H cm		Q l/min	Q cm <sup>3</sup> /min						
	26.44 - 25.80	500	3.7	1	1000	2250	20	2330	235	23600					$1.83 \times 10^{-6}$	18.1
				4	4000			6220	427	42200					$1.25 \times 10^{-6}$	12.5
				7	7000			9230	707	70700					$1.97 \times 10^{-6}$	19.2
				10	10000			12330	878	87800					$1.85 \times 10^{-6}$	18.2
				7	7000			9230	722	72200					$2.03 \times 10^{-6}$	20.3
				4	4000			6330	422	42200					$1.94 \times 10^{-6}$	19.4
				1	1000			3330	224	22400					$2.12 \times 10^{-6}$	21.2
	26.00 - 26.00	500	2.7	1	1000	2250	20	2270	352	22700					$2.54 \times 10^{-6}$	25.4
				4	4000			6220	654	65400					$2.65 \times 10^{-6}$	26.5
				7	7000			9230	1128	112800					$3.20 \times 10^{-6}$	32.0
				10	10000			12330	1451	145100					$2.70 \times 10^{-6}$	27.0
				7	7000			9230	1121	112100					$3.18 \times 10^{-6}$	31.8
				4	4000			6220	859	85900					$3.87 \times 10^{-6}$	38.7
				1	1000			3220	468	46800					$3.38 \times 10^{-6}$	33.8
	26.00 - 25.00	500	2.7	1	1000	3250	20	3270	129	12900					$8.24 \times 10^{-6}$	82.4
				4	4000			7230	228	22800					$8.61 \times 10^{-6}$	86.1
				7	7000			10330	429	42900					$1.15 \times 10^{-6}$	11.5
				10	10000			13330	553	55300					$1.15 \times 10^{-6}$	11.5
				7	7000			10330	409	40900					$1.10 \times 10^{-6}$	11.0
				4	4000			7230	257	25700					$2.70 \times 10^{-6}$	27.0
				1	1000			4330	185	18500					$1.18 \times 10^{-6}$	11.8
	25.00 - 24.00	500	2.7	1	1000	3250	20	3270	20	2000					$4.01 \times 10^{-6}$	40.1
				4	4000			7230	126	12600					$4.05 \times 10^{-6}$	40.5
				7	7000			10330	242	24200					$5.83 \times 10^{-6}$	58.3
				10	10000			13330	298	29800					$5.96 \times 10^{-6}$	59.6
				7	7000			10330	232	23200					$5.98 \times 10^{-6}$	59.8
				4	4000			7230	160	16000					$5.65 \times 10^{-6}$	56.5
				1	1000			4230	90	9000					$5.16 \times 10^{-6}$	51.6

# RECORD OF WATER PRESSURE TEST

PROJECT MATUND RIVER DEVELOPMENT  
BORE-HOLE No. BB-6 r 2

LOCALITY \_\_\_\_\_  
GROUND WATER LEVEL 10.5 m

DATE	DEPTH m	SECTION LENGTH L. cm	HOLE RADIUS r. cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{1}{L} \times \frac{1}{r} \times \frac{1}{C} \times \frac{1}{\log \frac{L}{r}}$ C. min/cm <sup>2</sup> sec	Q cm <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY $K = Q/H \times C \times 10^{-5}$	LUGEON UNIT $L_u = Q/H \times 10^8$
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm				Q l/min	Q cm <sup>3</sup> /min				
	4000	500	2.7	1	1000	4250	20	5330	11.7	11700		11700	$6.07 \times 10^{-5}$	44
				4	4000			8330	19.1	17100		17100	$5.68 \times 10^{-5}$	41
				7	7000			11330	28.2	22300		22300	$6.89 \times 10^{-5}$	50
				10	10000			14330	39.8	39800		39800	$7.87 \times 10^{-5}$	56
				7	7000			11330	27.7	27700		27700	$7.35 \times 10^{-5}$	52
				4	4000			8330	27.4	27400		27400	$7.11 \times 10^{-5}$	51
				1	1000			5330	13.0	13000		13000	$6.75 \times 10^{-5}$	49
	4500	500	2.7	1	1000	4250	20	5820	13	1300		1300	$6.17 \times 10^{-5}$	44
				4	4000			8320	3.9	3900		3900	$1.22 \times 10^{-5}$	0.9
				7	7000			11830	2.1	2100		2100	$1.86 \times 10^{-5}$	1.2
				10	10000			14830	11.2	11200		11200	$2.07 \times 10^{-5}$	1.5
				7	7000			11830	10.9	10900		10900	$2.55 \times 10^{-5}$	1.8
				4	4000			8820	7.2	7200		7200	$2.26 \times 10^{-5}$	1.6
				1	1000			5820	5.5	5500		5500	$2.61 \times 10^{-5}$	1.9

# RECORD OF WATER PRESSURE TEST

PROJECT MATANG RIVER DEVELOPMENT LOCALITY B - DAM SITE, LEFT ABUTMENT  
 BORE-HOLE No. B 8 - 7 - 1 GROUND WATER LEVEL - 22.5

DATE	DEPTH m	SECTION LENGTH L, m	HOLE RADIUS r, cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> , cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> , cm	TOTAL HEAD H <sub>p</sub> + H <sub>s</sub> + H <sub>g</sub> H, cm	WATER LEAKAGE		CALCULATING CONST $\frac{2.3}{2.3} \times \frac{1}{2.3} \times \frac{1}{2.3}$ C, min/m <sup>2</sup> sec	Q m <sup>3</sup> /min	COEFFICIENT OF PERMEABILITY K = Q/HxC m/sec	LUGEON UNIT L <sub>u</sub> = Q/L <sub>u</sub> X H <sub>u</sub>
				P kg/cm <sup>2</sup>	H <sub>p</sub> , cm				Q l/min	Q cm <sup>3</sup> /min				
	10.00 - 45.00	500	3.8	1	1000	12500	65	13565	16.5	16500		3.75 x 10 <sup>-5</sup>	2.4	
				4	4000			16565	28.1	38100		5.25 x 10 <sup>-5</sup>	4.6	
				7	7000			19565	28.9	48900		6.46 x 10 <sup>-5</sup>	5.0	
				10	10000			22565	5.93	59300		6.25 x 10 <sup>-5</sup>	5.3	
				4	4000			19565	28.6	48600		6.92 x 10 <sup>-5</sup>	5.0	
				1	1000			16565	2.28	22800		5.00 x 10 <sup>-5</sup>	3.9	
								12565	2.8	2800		5.34 x 10 <sup>-5</sup>	0.4	
	25.00 - 20.00	500	3.8	1	1000	12500	65	13565	46.1	46100		8.77 x 10 <sup>-5</sup>	6.8	
				4	4000			16565	5.99	59900		9.25 x 10 <sup>-5</sup>	7.2	
				7	7000			19565	2.22	22200		9.54 x 10 <sup>-5</sup>	7.4	
				10	10000			22565	2.51	25100		8.66 x 10 <sup>-5</sup>	6.7	
				7	7000			19565	5.91	59100		7.25 x 10 <sup>-5</sup>	5.7	
				4	4000			16565	4.31	43100		6.73 x 10 <sup>-5</sup>	5.2	
				1	1000			13565	2.88	28800		5.68 x 10 <sup>-5</sup>	4.4	
	25.00 - 20.00	500	3.8	1	1000	12500	65	13565	45.0	45000		8.53 x 10 <sup>-5</sup>	6.6	
				4	4000			16565	5.99	59900		9.25 x 10 <sup>-5</sup>	7.2	
				7	7000			19565	2.22	22200		9.54 x 10 <sup>-5</sup>	7.4	
				10	10000			22565	2.56	25600		8.66 x 10 <sup>-5</sup>	6.7	
				7	7000			19565	5.90	59000		7.25 x 10 <sup>-5</sup>	5.8	
				4	4000			16565	4.31	43100		6.73 x 10 <sup>-5</sup>	5.2	
				1	1000			13565	2.88	28800		5.68 x 10 <sup>-5</sup>	4.4	
	25.00 - 20.00	500	3.8	1	1000	12500	65	13565	32.5	32500		6.29 x 10 <sup>-5</sup>	4.9	
				4	4000			16565	5.30	53000		8.27 x 10 <sup>-5</sup>	6.4	
				7	7000			19565	4.26	42600		6.29 x 10 <sup>-5</sup>	4.9	
				10	10000			22565	2.08	20800		8.11 x 10 <sup>-5</sup>	6.3	
				7	7000			19565	2.69	26900		4.88 x 10 <sup>-5</sup>	3.8	
				4	4000			16565	3.18	31800		4.91 x 10 <sup>-5</sup>	3.8	
				1	1000			13565	2.77	27700		5.23 x 10 <sup>-5</sup>	4.1	

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT  
BORE-HOLE No. 88 - 7 - 2

LOCALITY \_\_\_\_\_  
GROUND WATER LEVEL - 12.0 m

DATE	DEPTH m	SECTION LENGTH L cm	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>s</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>p</sub> + H <sub>g</sub> + H <sub>s</sub> cm	WATER LEAKAGE Q cm <sup>3</sup> /min	CALCULATING CONST $\frac{1}{2} \times \frac{1}{r^2} \times \frac{1}{\log \frac{L}{r}}$ C min/cm <sup>2</sup> sec	g	COEFFICIENT OF PERMEABILITY K = Q/HXC m/sec	LUGEON UNIT L <sub>u</sub> = Q/L · HXC
				P kg/cm <sup>2</sup>	H <sub>p</sub> cm								
	30.00	500	3.8	1	1000	12000	65	18065	28000			4.41 × 10 <sup>-5</sup>	34
				4	5000			17065	32000			4.91 × 10 <sup>-5</sup>	38
				7	7000			20065	34200			4.99 × 10 <sup>-5</sup>	39
				10	10000			23065	45600			5.11 × 10 <sup>-5</sup>	40
				7	7000			20165	30000			3.87 × 10 <sup>-5</sup>	30
				4	4000			17065	33500			3.56 × 10 <sup>-5</sup>	28
				1	1000			18065	29800			4.51 × 10 <sup>-5</sup>	35
	35.00	500	3.8	1	1000	13000	65	18065	42300			7.78 × 10 <sup>-5</sup>	6.0
				4	4000			17065	45300			8.28 × 10 <sup>-5</sup>	6.5
				7	7000			20165	62200			8.02 × 10 <sup>-5</sup>	6.2
				10	10000			23065	72000			8.12 × 10 <sup>-5</sup>	6.3
				7	7000			20065	63600			8.20 × 10 <sup>-5</sup>	6.3
				4	4000			17065	54000			8.18 × 10 <sup>-5</sup>	6.3
				1	1000			18065	39200			7.34 × 10 <sup>-5</sup>	5.7
	40.00	500	3.8	1	1000	13000	65	18065	14100			2.59 × 10 <sup>-5</sup>	2.0
				4	4000			17065	34300			5.20 × 10 <sup>-5</sup>	4.0
				7	7000			20065	36700			4.73 × 10 <sup>-5</sup>	3.9
				10	10000			23065	38500			4.31 × 10 <sup>-5</sup>	3.3
				7	7000			20065	31400			4.02 × 10 <sup>-5</sup>	3.1
				4	4000			17065	27700			4.28 × 10 <sup>-5</sup>	3.2
				1	1000			18065	19800			3.10 × 10 <sup>-5</sup>	2.8
	45.00	500	3.8	1	1000	13000	65	18065	1700			3.13 × 10 <sup>-6</sup>	0.2
				4	4000			17065	22200			3.36 × 10 <sup>-6</sup>	2.6
				7	7000			20065	48700			6.20 × 10 <sup>-5</sup>	4.8
				10	10000			23065	67800			2.60 × 10 <sup>-5</sup>	5.9
				7	7000			20065	51300			6.61 × 10 <sup>-5</sup>	5.1
				4	4000			17065	34400			5.21 × 10 <sup>-5</sup>	4.0
				1	1000			18065	17100			3.44 × 10 <sup>-5</sup>	2.4

# RECORD OF WATER PRESSURE TEST

PROJECT MATUNO RIVER DEVELOPMENT LOCALITY Q-DAY SITE LEFT ABUTMENT  
 BORE-HOLE No. BB-8 GROUND WATER LEVEL -300m ~ -250m

DATE	DEPTH	SECTION LENGTH	HOLE RADIUS	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE	PRESSURE GAUGE HEIGHT	TOTAL HEAD	WATER LEAKAGE		CALCULATING CONST.	Q	COEFFICIENT OF PERMEABILITY	LUGEON UNIT
				P	HEAD				Q'	Q				
	m	L	r	P kg/cm <sup>2</sup>	Hp	Hs	Hg	Hp + Hs + Hg	cm <sup>3</sup> /min	cm <sup>3</sup> /min	C	cm <sup>3</sup> /min	K=Q/HxC/msec	Lp=Q'/L.Hx10 <sup>6</sup>
	30.00 - 35.00	500	3.8	1	1000	2000	65	27065	15.6	1500			172 x 10 <sup>-5</sup>	1.5
				4	5000			20065	17.3	1700			186 x 10 <sup>-5</sup>	1.4
				7	2000			27065	20.7	20200			198 x 10 <sup>-5</sup>	1.5
				10	1000			30065	22.3	22300			192 x 10 <sup>-5</sup>	1.5
				7	2000			27065	16.6	16600			159 x 10 <sup>-5</sup>	1.2
				4	5000			24065	17.6	17600			157 x 10 <sup>-5</sup>	1.2
				1	1000			27065	11.0	12000			107 x 10 <sup>-5</sup>	1.1
	35.00 - 40.00	500	3.8	1	1000	2300	65	24065	18.7	18700			201 x 10 <sup>-5</sup>	1.6
				4	5000			27065	24.8	24800			237 x 10 <sup>-5</sup>	1.8
				7	2000			30065	30.1	30600			263 x 10 <sup>-5</sup>	2.0
				10	1000			33065	44.5	44500			348 x 10 <sup>-5</sup>	2.7
				7	2000			30065	20.4	20400			176 x 10 <sup>-5</sup>	1.4
				4	5000			27065	13.8	13800			122 x 10 <sup>-5</sup>	1.0
				1	1000			24065	8.7	8700			92 x 10 <sup>-6</sup>	0.7
	40.00 - 45.00	500	3.8	1	1000	2200	65	24065	13.2	13200			137 x 10 <sup>-5</sup>	1.1
				4	5000			27065	15.9	15900			159 x 10 <sup>-5</sup>	1.3
				7	2000			30065	26.5	26500			182 x 10 <sup>-5</sup>	1.4
				10	1000			33065	23.1	23100			158 x 10 <sup>-5</sup>	1.4
				7	2000			30065	15.3	15300			129 x 10 <sup>-5</sup>	1.0
				4	5000			27065	12.7	12700			129 x 10 <sup>-5</sup>	1.0
				1	1000			24065	11.0	11000			116 x 10 <sup>-5</sup>	0.9
	45.00 - 50.00	500	3.8	1	1000	2400	65	24065	14.8	14800			153 x 10 <sup>-5</sup>	1.3
				4	5000			28065	18.4	18400			170 x 10 <sup>-5</sup>	1.3
				7	2000			31065	22.9	22900			199 x 10 <sup>-5</sup>	1.5
				10	1000			34065	28.7	28700			218 x 10 <sup>-5</sup>	1.7
				7	2000			31065	19.2	19200			161 x 10 <sup>-5</sup>	1.2
				4	5000			28065	11.1	11100			102 x 10 <sup>-5</sup>	0.8
				1	1000			25065	8.2	8200			746 x 10 <sup>-6</sup>	0.7



# RECORD OF WATER PRESSURE TEST

PROJECT MATUWA RIVER DEVELOPMENT LOCALITY B-DAM SITE, LEFT ANTIWENT  
 BORE-HOLE No. B0-9- GROUND WATER LEVEL

DATE	DEPTH m	SECTION LENGTH L m	HOLE RADIUS r cm	SUPPLIED WATER PRESSURE		STATIC HEAD IN HOLE H <sub>0</sub> cm	PRESSURE GAUGE HEIGHT H <sub>g</sub> cm	TOTAL HEAD H <sub>0</sub> +H <sub>g</sub> +H <sub>e</sub> cm	WATER LEAKAGE		CALCULATING CONST $\frac{L^2}{3r^2} \times \frac{1}{60} \times \frac{1}{1000}$ C cm <sup>2</sup> /cm <sup>2</sup> sec	H cm/mils	COEFFICIENT OF PERMEABILITY K=Q/Hx C cm/sec	LUCKON UNIT L <sub>u</sub> =Q/Lx Hx M <sup>2</sup>
				HEAD H <sub>p</sub> cm	PRESSURE P kg/cm <sup>2</sup>				Q l/min	Q cm <sup>3</sup> /min				
	3000	500	3.8	1000	1	32500	65	32565	0.2	200			$1.81 \times 10^{-7}$	0.01
				8000	2			32565	1.7	1700			$1.37 \times 10^{-6}$	0.1
				2000	7			32565	15.8	15000			$1.12 \times 10^{-5}$	0.9
				10000	10			32565	50.3	52300			$3.60 \times 10^{-4}$	2.8
				2000	7			32565	40.2	41800			$3.13 \times 10^{-5}$	2.4
				8000	2			32565	19.6	19100			$1.61 \times 10^{-6}$	1.2
				1000	1			32565	6.2	6200			$5.61 \times 10^{-6}$	0.4
	3000	500	3.8	1000	1	32500	65	32565	2.2	2200			$1.70 \times 10^{-6}$	0.1
				8000	2			32565	11.5	11500			$2.43 \times 10^{-6}$	0.6
				2000	7			32565	30.2	30200			$1.97 \times 10^{-5}$	1.5
				10000	10			32565	50.8	50800			$3.55 \times 10^{-5}$	2.7
				2000	7			32565	30.8	30200			$2.51 \times 10^{-5}$	1.9
				8000	2			32565	18.9	17800			$1.27 \times 10^{-5}$	1.0
				1000	1			32565	6.8	6800			$4.83 \times 10^{-6}$	0.4
	3500	500	3.8	1000	1	32500	65	38565	0	-			-	0
				8000	2			38565	0	-			-	0
				2000	7			38565	1.1	1100			$6.28 \times 10^{-7}$	0.05
				10000	10			38565	2.0	2000			$1.09 \times 10^{-6}$	0.1
				2000	7			38565	1.0	1000			$5.80 \times 10^{-7}$	0
				8000	2			38565	0	-			-	0
				1000	1			38565	0	-			-	0
	2000	500	3.8	1000	1	32500	65	42565	21.8	33600			$1.82 \times 10^{-5}$	1.5
				8000	2			42565	51.8	51800			$3.22 \times 10^{-5}$	2.5
				2000	7			42565	28.4	28400			$4.15 \times 10^{-5}$	3.2



# DAILY RAINFALL RECORD

STATION: BANTE BAMBANG  
NUEVA VIZCAYA

El. \_\_\_\_\_ Annual total: \_\_\_\_\_ Year 1980

D	M	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	M	D
1							39.0	9.0	9.5	3.5	15.5	27.5	0		1
2							0	0	3.0	19.5	31.0	7.0	0		2
3							0	0	0.5	0	0.5	0.5	0		3
4							1.0	2.5	5.0	34.0	25.5	94.0	1.0		4
5							0	0	7.5	0.5	4.5	296.0	1.5		5
6							33.5	0	0	0.5	0	13.5	0		6
7							2.0	8.5	62.0	24.0	0	0.5	0		7
8							0	3.0	9.5	0	0.5	1.0	0		8
9							0	4.0	1.0	0	0	1.0	0		9
10							0	4.5	0	0	0	2.5	0		10
11							0	0	9.0	6.0	0	4.0	3.5		11
12							0	0	4.5	24.0	0	0	3.0		12
13							0	0	0	1.0	20.0	0	0		13
14							0	5.5	0	20.0	0	0	0		14
15							0	8.5	2.5	0	37.0	0	5.5		15
16							0	11.5	2.0	0	5.0	7.5	4.0		16
17							0	0	3.5	15.5	0	3.5	0.5		17
18							0	1.0	0.5	3.5	13.0	1.0	4.0		18
19							2.0	7.0	0	0	0	0	3.0		19
20							2.0	22.0	0	23.5	0	0	0		20
21							0.5	69.0	0	2.5	4.5	0	0		21
22							0	0	0	18.0	0	0	0		22
23							1.0	10.0	0	0	8.0	2.0	0		23
24							0	12.5	0	0	0	0	0		24
25							0	63.0	10.0	20.0	0	2.5	0		25
26							0	0	0	9.5	0	0	0		26
27							0	0	17.5	1.0	19.0	0	0		27
28							0	0	30.5	5.5	46.5	0	0		28
29							0	0	0	18.5	58.5	0	0		29
30							3.0	18.0	0	15.0	0.5	0	0		30
31								0	21.0		15.0		0		31
Max															Max
Days							2.8	8.4	6.4	8.9	8.8	15.5	C.F		Days
Total							84.0	259.5	199.0	265.5	304.5	464.0	26.0		Total

Unit: mm

N. K. Form No. 1101

# DAILY RAINFALL RECORD

BANTE BAMBANG  
STATION: NUEVA VIZCAYA (2)

El. \_\_\_\_\_ Annual total: \_\_\_\_\_ Year 1981

M D	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	M D
1	0	0	0	0	0	38.5	0	0	0	0	0	8.0	1
2	1.3	0	0	0	0	1.2	0	19.2	0	10.1	0	1.5	2
3	0	0	0	0	0	2.6	2.3	2.8	10.0	12.5	0	0	3
4	0	6.9	0	0	0	0	59.0	24.0	12.9	17.0	0	0.5	4
5	0	0	0	0	0	0	16.7	0	0	9.5	0	0	5
6	0	6.0	0	0	1.5	0	0	0	2.5	10.0	0	0	6
7	0	0	0	0	0	0	0	2.3	3.2	0	1.0	0.5	7
8	0	0	0	0	13.0	1.9	13.9	7.5	0	0	1.0	0.5	8
9	0	0	0	0	41.5	14.9	0	0	0	0	3.0	0.5	9
10	0	0	0	0	1.3	9.3	5.8	0	0	0	5.5	1.0	10
11	0	2.3	0	0	0	6.0	72.4	0	0	1.9	13.5	2.0	11
12	0	0	0	0	0.7	14.4	4.0	3.5	0	4.5	0	1.0	12
13	0	0	0	0	0	0	0	0.4	0	6.2	2.0	1.5	13
14	0	0	0	0	0	0	23.5	0	2.3	0	0.5	0	14
15	0	0	0	0	0	0	55.0	54.4	11.3	0	0	0	15
16	0	0	0	0	0	0	0	0	0	0	6.0	0	16
17	0	0	0	1.8	2.1	22.1	0	6.2	0	0	4.5	0.5	17
18	1.5	0	0	0	3.8	0	16.8	8.3	3.2	1.2	0.5	0.5	18
19	1.3	0	0	51.7	27.2	2.4	1.4	11.2	13.4	3.0	0	0	19
20	0.8	0	0	102.9	54.5	12.7	7.2	11.0	18.4	0	11.0	0	20
21	0	0	0	3.1	32.7	16.4	0	0	0	0	0	0	21
22	0	0	0	7.6	4.2	0	0	0	0	33.6	8.0	0	22
23	0	0	0	4.5	0	0	0	2.0	0	35.8	0	0	23
24	0	0	0	4.1	12.4	0	20.1	0	0	12.5	141.0	0	24
25	0	0.2	0	45.7	13.3	13.4	0	0	6.6	4.0	4.5	1.0	25
26	0	6.5	0	1.8	1.8	0	0	10.0	2.1	12.6	0	2.0	26
27	11.2	0.7	0	0	2.9	0	0	0	8.2	11.5	0	0	27
28	0	1.1	0	0	10.1	13.9	0	0	0	4.3	1.5	0	28
29	2.8	0	0	0	0	12.4	0	0	2.8	10.6	0	0	29
30	0		0	0	0	9.9	0	0	0	4.0	2.0	0	30
31	0		0		0		0	0		0		0	31
Max													Max
Days				22	7.2	6.4	9.6	6.3	3.2	6.6	6.9		Days
Total	18.9	23.7	0	223.2	222.3	192.0	298.1	194.3	96.9	204.8	205.5	21.0	Total

Unit: mm

N. K. Form No. 1101

# DAILY RAINFALL RECORD

BANTE BAMBANG  
STATION: NUEVA VIZCAYA

El. \_\_\_\_\_ Annual total: \_\_\_\_\_ Year 1982

M D	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	M D
1				0	0	0							1
2				1.0	0	0							2
3				0	0	0							3
4				11.5	0	20.4							4
5				0	0	13.4							5
6				0	0	0							6
7				11.0	0	0							7
8				1.0	0	0							8
9				1.9	0.6	0							9
10				1.4	0	2.0							10
11				2.0	0	0							11
12				9.0	0	0							12
13				1.9	0	11.9							13
14				19.5	2.5	0							14
15				12.5	0	0							15
16				0	0	0							16
17				4.6	0	0							17
18				0	0	0							18
19				3.6	0	0							19
20				2.2	9.0	0							20
21				1.6	7.5	13.5							21
22				1.0	52.5	0							22
23				0	40.4	0							23
24				2.0	23.2	12.0							24
25				0	0	0							25
26				0	9.2	0							26
27				0	0	4.7							27
28				0	10.7	1.2							28
29				0	3.9	3.1							29
30				1.5	0	0							30
31				0	50.5								31
Max													Max
Days													Days
Total				89.2	210.0	86.2							Total

Unit: \_\_\_\_\_

N. K. Form No. 1101

# DAILY RAINFALL RECORD *(mm unit)*

STATION: AMBAGU'D (A-DAMSITE)

El. 700<sup>m</sup> (Approx.) Annual total: \_\_\_\_\_ Year 1982

M D	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	M D
1								0	16.0	0	10.5	2.0	1
2								31.5	0.5	0	2.5	40.0	2
3								0.5	0	3.0	12.0	6.5	3
4								67.5	0	0	6.5	0.5	4
5								52.0	1.0	0	5.0	9.5	5
6								0	5.5	5.5	4.0	9.0	6
7								1.0	5.0	0.5	5.5	0.5	7
8								0.5	3.0	0	0	1.0	8
9								0	38.0	0	19.5	5.0	9
10								0	3.5	14.5	25.5	0	10
11								0	0	10.0	16.5	0	11
12								0	0		2.0	0	12
13								0	2.5		38.0	1.0	13
14								0	35.0		6.0	3.0	14
15								0	11.0		0	3.5	15
16								0	0		0	0	16
17								0	23.5		0.5	2.5	17
18							10.5	0	3.5		1.5	5.0	18
19							12.0	0	0		0	2.5	19
20							0	12.5	0		5.5	0.5	20
21							2.0	9.0	0		0	0	21
22							13.0	0.5	0		0	10.0	22
23							8.5	4.0	0		42.0	2.0	23
24							0	92.5	37.0		11.0	4.0	24
25							0	3.5	36.0		21.5	0	25
26							0	0	29.5		8.5	8.5	26
27							0	10.5	0		27.5	7.0	27
28							0	12.0	23.5		0.5	2.0	28
29							0.5	11.5	3.5		0	0	29
30							0.5	2.0	6.0		36.0	0	30
31							0	4.0				0	31
Max								92.5	38.0		42.0	40.0	Max
Days								17	19		23	22	Days
Total								324.0	283.5		307.0	125.5	Total

Unit: \_\_\_\_\_

N. K. Form No. 1101

# DAILY RAINFALL RECORD (mm. in.)

STATION: AMERSON FIELD

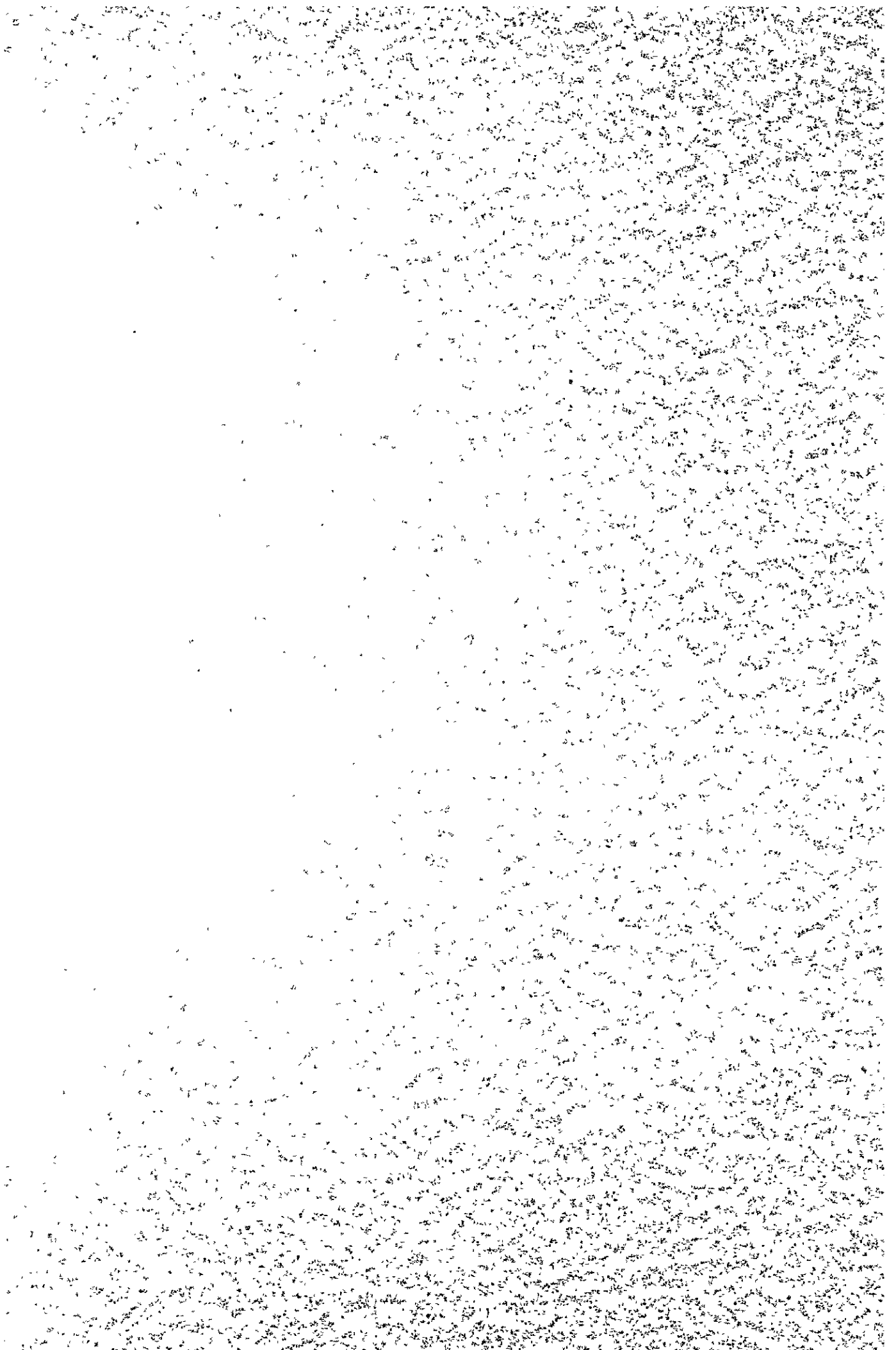
El. 700<sup>m</sup> (Approx.)

Annual total: \_\_\_\_\_

Year 1983

M D	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	M D
1	9.5	0	2.0	0									1
2	1.5	0	0	0									2
3	11.5	0	0	0.5									3
4	2.0	0	0	6.5									4
5	0	0	0	0									5
6	0	0	0	0									6
7	0	0	0.5	0									7
8	0	0	0	0									8
9	0	0	0	0									9
10	28.5	0	0	0									10
11	18.0	0	0	0									11
12	0	0	0	0									12
13	7.5	0	0	0									13
14	5.0	0	7.5	0									14
15	3.5	0	0	0									15
16	29.5	0	0	0									16
17	2.5	0	0	0									17
18	0.5	0	17.5	0									18
19	10.0	0	0	0									19
20	30.5	0	0	0									20
21	7.0	3.0	0	0									21
22	3.0	1.0	0	0									22
23	0	2.0	0	0									23
24	0	0	0	0									24
25	0	0	0	0									25
26	0	0	0	0									26
27	0	0	0	0									27
28	0	0	3.0	0									28
29	0		0	0									29
30	0		0	0									30
31	0		0										31
Max	30.5	3.0	17.5	6.5									Max
Days	16	3	5	2									Days
Total	170.0	6.0	30.5	7.0									Total

Unit: \_\_\_\_\_









JICA