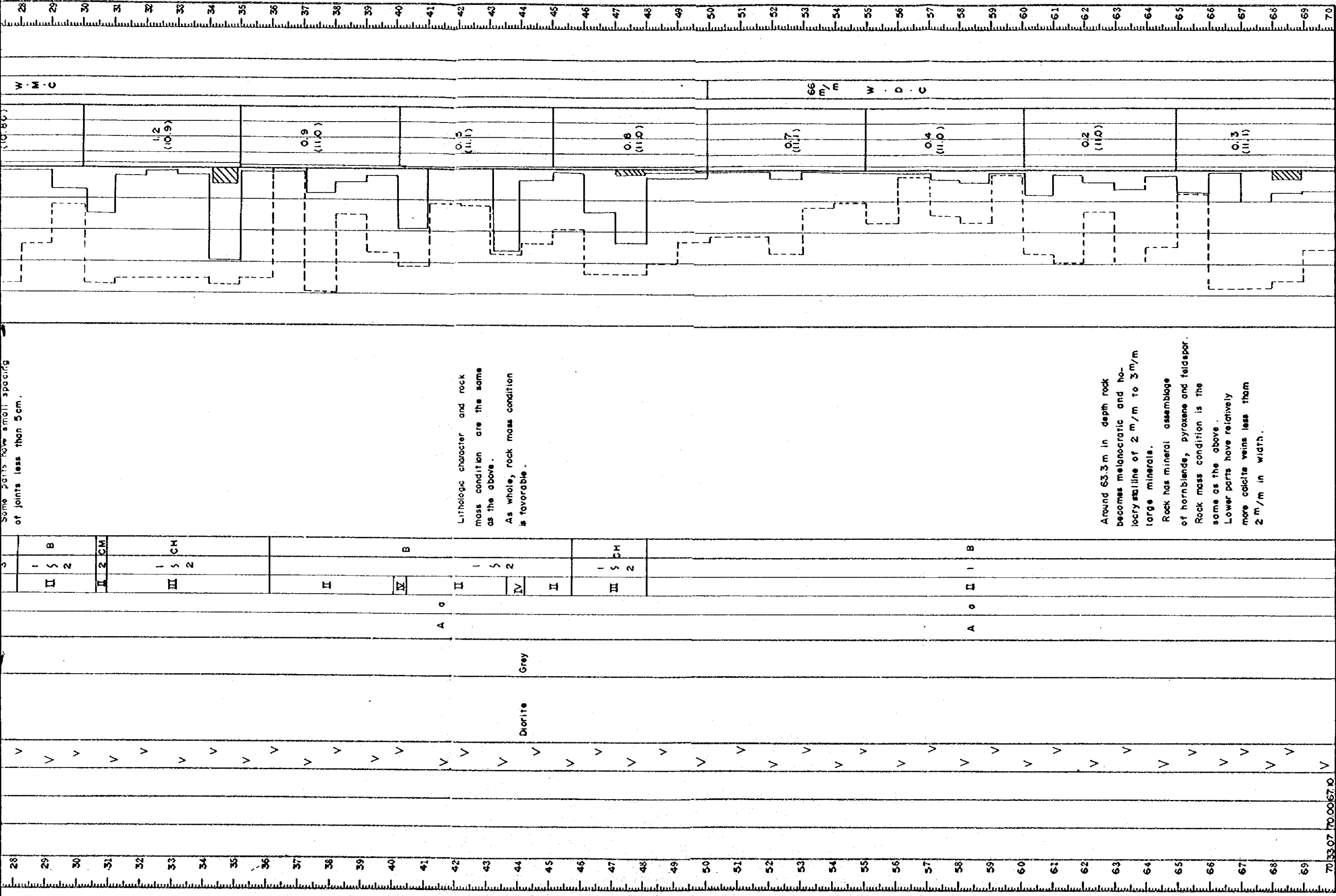


LEGEND OF BORING LOG

Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification element				Description	Core recovery (%) Maximum core length (cm) Rock quality designation (%) Core shape (%)	Lugeon value 1/min.m. ¹⁰ kg	Core barrel & bit Core S.M.C S.D.C W.M.C W.D.C	Water supply and return	(Final) morning water level	E Scale
1							Weathering condition	Relative hardness	Spacing	Relative to rock mass	Classification of rock mass	20					1
2							Relative to rock mass	Relative to rock mass	Relative to rock mass	Relative to rock mass	Legend of ① core shape. Core condition recovered is shown by every one meter.	40					2
3							Based on criterion of rock mass classification, after SAITO & KIKUCHI See Fig.				<ul style="list-style-type: none"> □ Cylindrical core. ▨ Brecciated core without soil. ▤ Soil core: Gravel, Sand, Clay and their mixture. 	60					3
4											<p>For example, core condition between 5m and 6m in depth.</p> <ul style="list-style-type: none"> ① Core recovery 90%. ② Max. core length 20cm. ③ R. Q. D 35% ④ Core shape <ul style="list-style-type: none"> • 50% cylindrical core • 35% cylindrical core more than 10cm in length, 20cm long one and 15cm long one. • 15% cylindrical core less than 10cm in length. • 25% brecciated core. • 15% soil core. 	80				4	
5																	5
6																	6
7																	7
8																	8
9																	9
10																	10
11																	11
12																	12
13																	13
14																	14

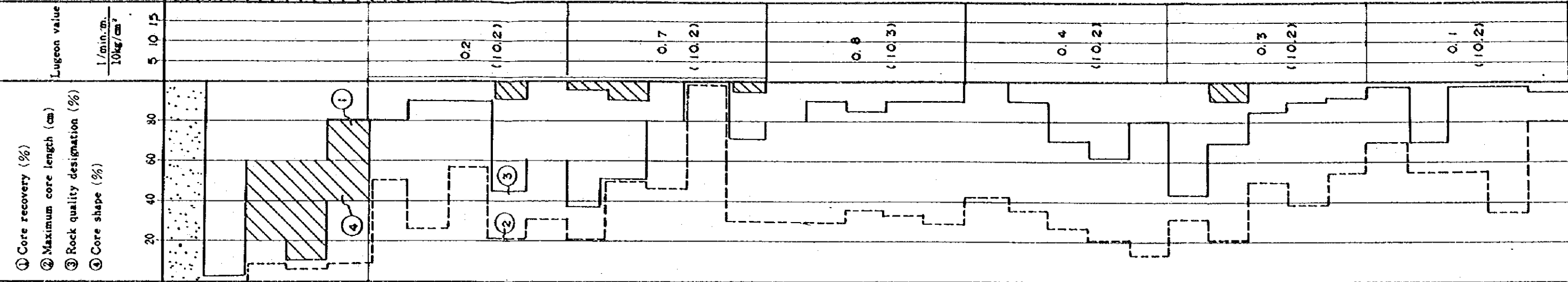
Fig.6-7 (AN)

LEGEND OF BORING LOG



BORING LOG

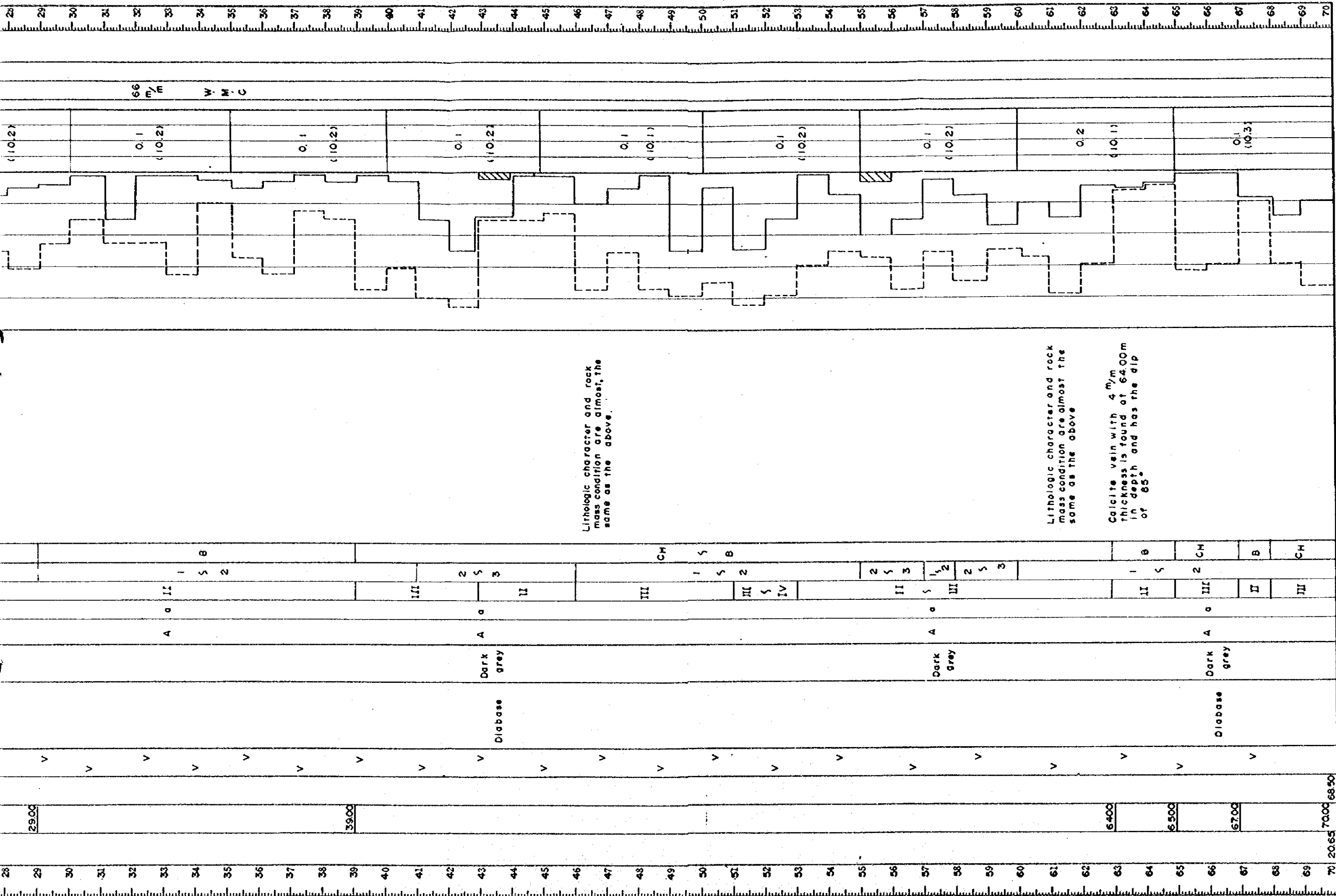
PROJECT THE JENERANG RIVER FLOOD CONTROL (PHASE II)									
BOREHOLE NO. BM - 2		LOCATION LEFT SIDE RIVER BED OF MAIN DAM		DIAMETER OF HOLE 70 m		ORIENTATION 90°		DATE FROM 15 APRIL TO 2 MAY 1981	
ELEVATION OF HOLE 49.35 m		DEPTH OF HOLE 49.35 m		CHECKED BY T. MURAKAMI		Lugeon value		Core barrel and bit	
MACHINE UD - 5		Rock type		Colour		Classification element		Lugeon value	
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Weathering condition		Description
							Relative hardness	Spacing of joints	
Scale		Scale		Scale		Scale		Scale	
1	47.85	1.50	1.50	0.5 0.0	River gravel	Dark grey Brown grey	Soil and gravel	CL	Rounded and subrounded hard gravel less than 5cm in diameter. Matrix consists of medium sand.
2				V				CL	No core are recovered between 1.0m and 2.4 m in depth.
3				V				CL	Residual cores slightly weathered are recovered. Soft and hard rock.
4				V	Diabase	Dark grey	IV 4	CM	Brown discoloration along the joint plane are found, and some parts between joints are some how decomposed to be softened.
5				V	Diabase	Dark grey	IV 3	CM	Fresh and hard but brown discoloration along joint planes are found
6				V					Fresh and hard rock between 5.20m and 7.00m in depth. Lithologic character of this rock has melanocratic and holocrystalline porphyritic texture.
7				V					Mineral assemblage is composed mainly of 0.5m/m to 3 m/m large olivine, hornblende and Pyroxene.
8				V					Joints are found by the spacing of 0.1m to 1.0m.
9				V					Discoloration by dark green, white and black in color are found along joint planes, but not brown discoloration.
10	1020			V			III 3		Some joints have very thin clayey materials between them, and serpentinization along them are partly found.
11	1140			V			III 3		Thin calcite veins are found along some joint planes.
12				V					Dips of joints are found by 10°, 30°, 40°, 60°, 75° and 90°.
13				V					Clay seam of 1cm to 3cm in thickness with the dip of 80° is found along the joint plane at 11.20m in depth and serpentinization of rock and breccia along it are also found.
14				V					Very thin clay seam along the joint plane is found at 14.10m in depth and its dip has 70°.
15				V					
16				V					
17				V					
18				V					
19				V					
20				V					
21				V					
22				V					
23				V					
24				V					
25				V					
26				V					
27				V					
28				V					
29	2900			V					
30				V					
31				V					
32				V					
33				V					
34				V					
35				V					



① Core recovery (%)
 ② Maximum core length (cm)
 ③ Rock quality designation (%)
 ④ Core shape (%)

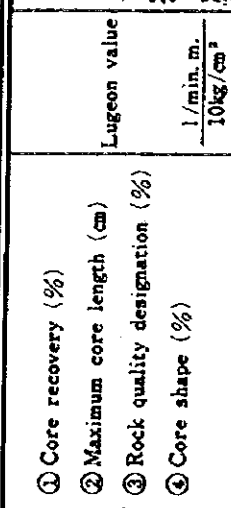
Scale 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

Water supply and return
 Morning water level
 Core barrel and bit
 Coating, etc.
 Lugeon value
 1/(min. m. / 10kg/cm²)
 76 m/m S.M.C.
 76 m/m W.M.C.
 66 m/m W.M.C.



BORING LOG

PROJECT THE JENEBERANG RIVER FLOOD CONTROL (PHASE II)															
BOREHOLE NO. BM - 3		LOCATION		CENTER OF RIVER BED OF MAIN DAM		DIAMETER OF HOLE		ORIENTATION							
ELEVATION OF HOLE		DEPTH OF HOLE		100.00 m		66 m		90°							
MACHINE		CHECKED BY		T. MURAKAMI		DATE									
S. M		S. M		From 5 May to 29 May 1981											
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification of rock mass			Description	Lugeon value l/min.m 10kg/cm ²	Core barrel and bit Casing, etc.	Water supply and return l/m	Morning water level	Scale
							Weathering condition	Relative hardness	Spacing of joints						
1	39.22	8.90	8.90		River gravel	Grey				GRAVEL	76 m ² S.M.C		0.20	1	
2														2	
3														3	
4														4	
5														5	
6														6	
7														7	
8														8	
9														9	
10					Calcareous sandstone	Grey	B d II	3 CL						10	
11														11	
12														12	
13	35.27	2.85	3.95		Calcareous mudstone	Dark grey	A d I B	I CM						13	
14														14	
15														15	
16	32.37	15.75	2.90			Black	B d IV	3 CL						16	
17						Greenish dark grey	B b I	3 CM						17	
18														18	
19														19	
20														20	
21														21	
22					Diabase	Dark grey	B b II	3 CM						22	
23														23	
24														24	
25														25	
26														26	
27														27	
28														28	
29														29	
30														30	
31														31	
32														32	
33														33	
34														34	
35														35	



Gravel and sand.
Maximum core length which may almost equal the diameter of river gravel is found by 20 cm in length. But gravels of 30 cm or 40 cm in diameter are found at the river bed surface.
Most of gravels are fresh and hard rock composed of diabase, andesite and so on. A little weathered gravels are found. Matrix among the gravels are composed of coarse sand.
Gravel content is approximately more than 70%.

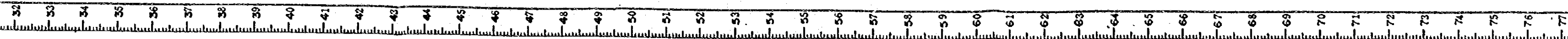
Calcareous sandstone is found between 8.90m and 9.00m in depth.
Mainly calcareous sandstone and less mudstone. Soft rock showing massive with rare cracks.
Recrystallization of calcite and spots of pyrites are partly found. Many fossils of foraminifera and shells are found.

Calcareous sandy mudstone are dominant and less sandstone.
Bedding structure is so much disturbed, but dips less than 25° are found.
Many fossils are found. 2 to 3cm wide clay is found around 4.5m in depth.
Around the boundary, no thermal alternation is found, but cracks and discoloration are found.

Dike rock gives no brecciated or no clay zone at the boundary between diabase and calcareous mudstone. Both of them relatively stick together.
But discoloration of dark black green color and some weathering along the boundary are found.
The dip of the boundary is measured by 60° to 65°.

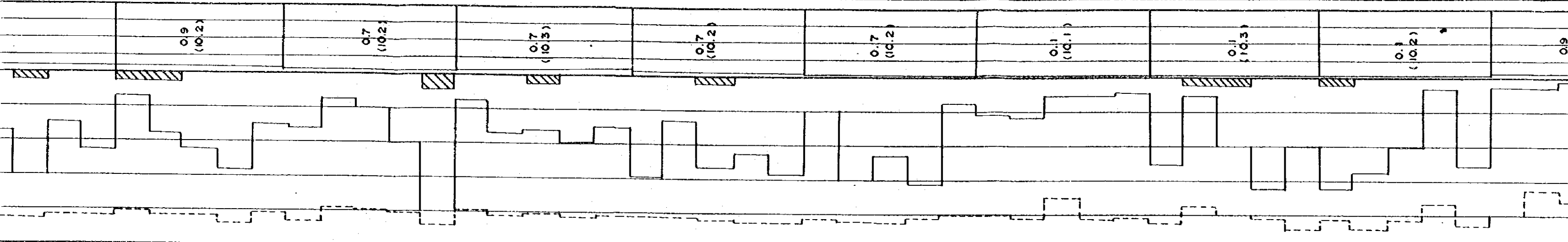
Lithologic character show porphyritic texture. 2m/m to 3 m/m large diameter of hornblende and pyroxene and 1 m/m large diameter of olivine are found as phenocryst. Matrix is also crystallized, but too small.

Rock is fresh and hard but has relatively small spacing joints.
Along the joints calcite veins less than 2m/m in width are sometimes found.
Dips of joints are 30°, 45°, 60°. Discoloration along the joints are found.



66 E S . D . C

66 m E



Dips of joints are 30°, 45°, 60°. Discoloration along the joints are found.

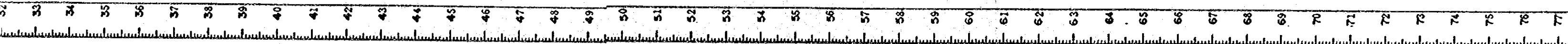
At approximately 40m in depth, Lithologic character becomes gradually holocrystalline porphyritic texture. Olivine is found. Rock and rock mass condition are the same as the above. Partly apitic vein of 2 cm in width is found.

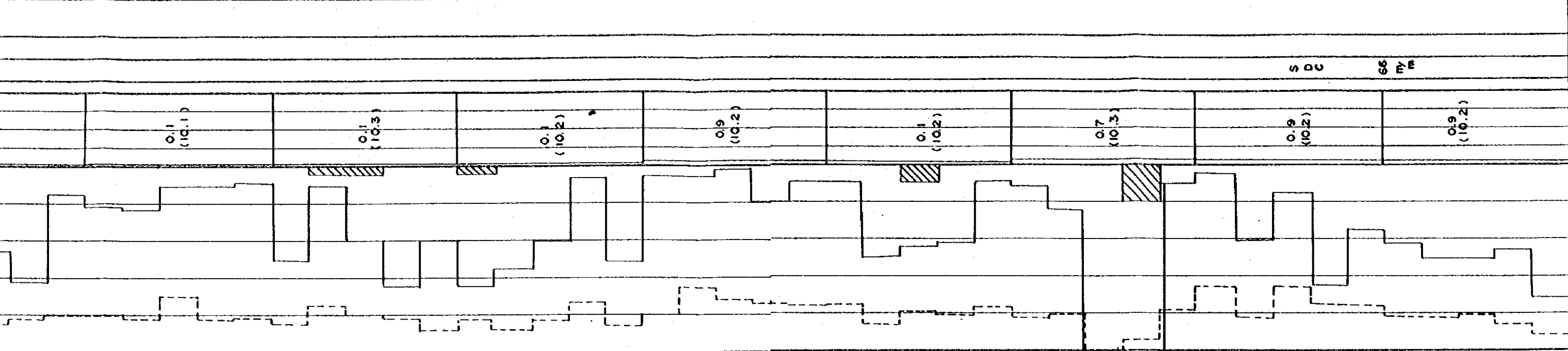
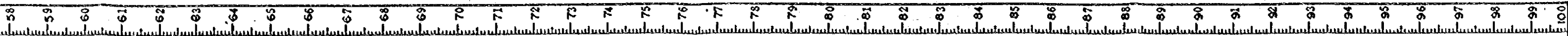
At approximately 55 m in depth, Lithologic character becomes gradually holocrystalline-granular structure, though slightly remain holocrystalline porphyritic structure. Diameter of horn-blende, pyroxene and feldspar is between 2m/m and 4 m/m. Olivine is rarely found.

A o III 2 CH 3

Dark grey
Diabase

Dark grey
Diabase





structure.
 Diameter of horn - blende, pyroxene
 and feldspar is between
 2m/m and 4 m/m.
 Olivine is rarely found.

Lithologic character and rock mass
 condition are the same as the
 above.

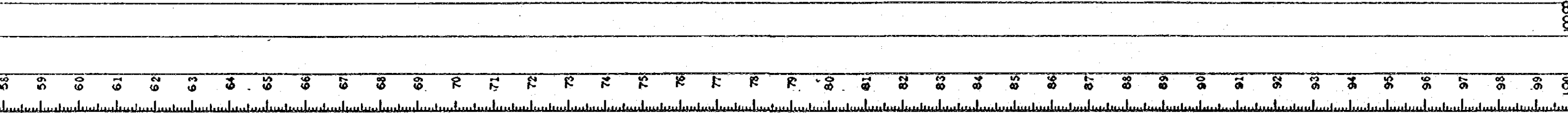
Lithologic character and rock mass
 condition are the same as the
 above.

Dark grey
 Diabase

A o III 2 3 CH

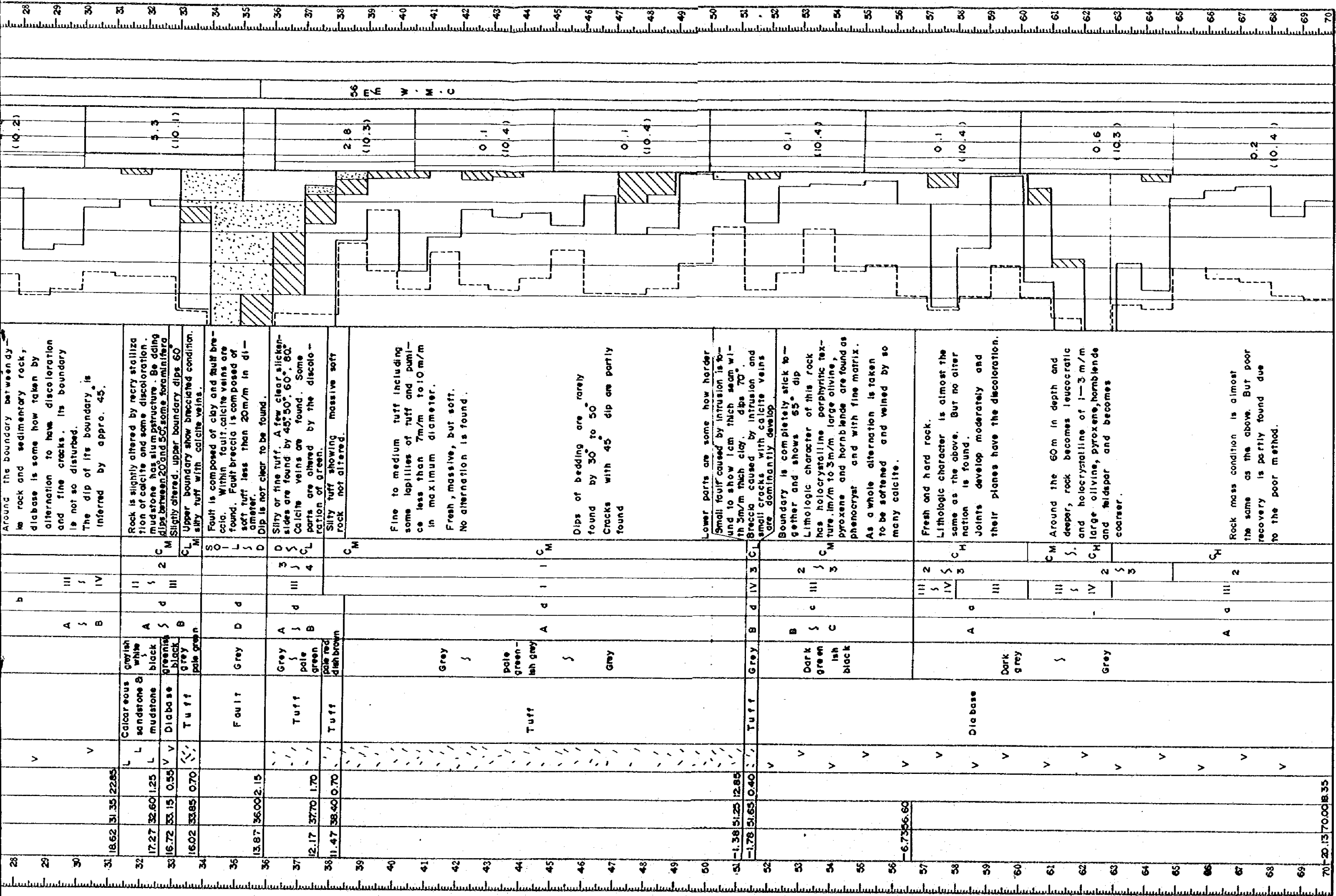
Dark grey
 Diabase

A o III 2 3 CH



BORING LOG

PROJECT: THE JENEBERANG RIVER FLOOD CONTROL (PHASE II)																		
BOREHOLE NO. BM - 4		LOCATION		RIGHT SIDE RIVER BED OF MAIN DAM		DIAMETER OF HOLE		ORIENTATION										
ELEVATION OF HOLE		DEPTH OF HOLE		70 m		66 m		90°										
MACHINE		CHECKED BY		DATE		FROM 31 MAY TO 12 JUNE 1981												
ELEVATION OF HOLE		DEPTH OF HOLE		70 m		66 m		90°										
MACHINE		CHECKED BY		DATE		FROM 31 MAY TO 12 JUNE 1981												
Scale	m	Elevation	m	Depth	m	Log	Rock type	Colour	Description	① Core recovery (%)	② Maximum core length (cm)	③ Rock quality designation (%)	④ Core shape (%)	Lugeon value l/min.m. 10kg/cm ²	Core barrel and bit	Water supply and return	Morning water level	Scale
1	48.42	1.45	1.45	1.45	River sand	Pale brown	L	L	Fine sand as river deposits. Including pebble less than 3cm in diameter.	76	2.25	S	-	-	-	-	2.25 m	
2	41.37	8.50	7.05	7.05	River gravel	Grey	S	S	No core recovered between 1.45m and 2.80m depth might be estimated there is river sand.	76	2.50	S	-	-	-	-	2.50 m	
3					River gravel	Dark grey	L	L	Gravels are found between 2.80m and 5.00m in depth. Gravels between 2.80m and 5.00m are composed of andesite and diabase which are mostly fresh and hard, including slightly weathered gravels. 20cm diameter of gravel is inferred as maximum.	76	-	S	-	-	-	-	-	
4					River gravel	Dark grey	L	L	Gravel between 5.00m and 8.50m are composed only of diabase which is fresh and hard. And its lithologic character is not different from bedrock one.	76	-	S	-	-	-	-	-	
5					River gravel	Dark grey	L	L	Fresh and hard rock. Joints moderately develop.	76	-	S	-	-	-	-	-	
6					River gravel	Dark grey	L	L	Lithologic character of this rock is melanocratic and holocrystalline porphyritic texture. Mineral assemblage is composed of 1m/m to 3m/m large olivine, pyroxene, hornblende as phenocryst minerals. Matrix is also crystallized but less than 0.5m/m large minerals. Rock mass condition is somehow favourable. Joint planes are contaminated by greenish black colour but not brown colour.	76	-	S	-	-	-	-	-	
7					River gravel	Dark grey	L	L	And very thin clayey materials are rarely found along them.	76	-	S	-	-	-	-	-	
8					River gravel	Dark grey	L	L	Calcite veins less than 2m/m in width are sometimes found.	76	-	S	-	-	-	-	-	
9					River gravel	Dark grey	L	L	Dip of joint is found by 10°, 30°, 45° and 75°.	76	-	S	-	-	-	-	-	
10					River gravel	Dark grey	L	L	Vertical joint is found with calcite vein at 17.50m and this part is to some degree altered to show black colour.	76	-	S	-	-	-	-	-	
11					River gravel	Dark grey	L	L	Around the boundary between dyke rock and sedimentary rock, diabase is some how taken by alteration to show discoloration and fine cracks. Its boundary is not so disturbed.	76	-	S	-	-	-	-	-	
12					River gravel	Dark grey	L	L	The dip of its boundary is inferred by approx. 45°.	76	-	S	-	-	-	-	-	
13					River gravel	Dark grey	L	L	Rock is slightly altered by recrystallization of calcite and some discoloration. Mudstone has siltum structure. Bedding dips between 20° and 50°, some foraminifera slightly altered. Upper boundary dips 60°.	76	-	S	-	-	-	-	-	
14					River gravel	Dark grey	L	L	Upper boundary show brecciated condition. Silt tuff with calcite veins.	76	-	S	-	-	-	-	-	
15					River gravel	Dark grey	L	L	Fault is composed of clay and fault breccia. Within fault, calcite veins are found. Fault breccia is composed of soft tuff less than 20m/m in diameter.	76	-	S	-	-	-	-	-	
16					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
17					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
18					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
19					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
20					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
21					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
22					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
23					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
24					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
25					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
26					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
27					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
28					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
29					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
30					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
31					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
32					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
33					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
34					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	
35					River gravel	Dark grey	L	L	-	76	-	S	-	-	-	-	-	



Around the boundary between the rock and sedimentary rock, diabase is some how taken by alternation to have discoloration and fine cracks. Its boundary is not so disturbed. The dip of its boundary is inferred by approx. 45°.

Rock is slightly altered by recrystallization of calcite and some discoloration. Mudstone has slump structure. Bedding dips between 50° and 55°, some foraminifera slightly altered. Upper boundary dips 60°. Silty tuff with calcite veins.

Fault is composed of clay and fault breccia. Within fault, calcite veins are found. Fault breccia is composed of soft tuff less than 20m/m in diameter. Dip is not clear to be found.

Silty or fine tuff. A few clear slickensides are found by 45°, 50°, 60°, 80°. Calcite veins are found. Some parts are altered by the discoloration of green.

Silty tuff showing massive soft rock not altered.

Fine to medium tuff including some lapillies of tuff and pumice less than 7m/m to 10m/m in maximum diameter. Fresh, massive, but soft. No alternation is found.

Dips of bedding are rarely found by 30° to 50°. Cracks with 45° dip are partly found.

Lower parts are some how harder. Small fault caused by intrusion is to and to show 1cm thick seam with 3m/m thick clay. dips 70°. Breccia caused by intrusion and small cracks with calcite veins are dominantly developed.

Boundary is completely stick together and shows 65° dip. Lithologic character of this rock has holocrystalline porphyritic texture, 1m/m to 3m/m large olivine, pyroxene and hornblende are found as phenocryst and with fine matrix. As a whole alternation is taken to be softened and veined by so many calcite.

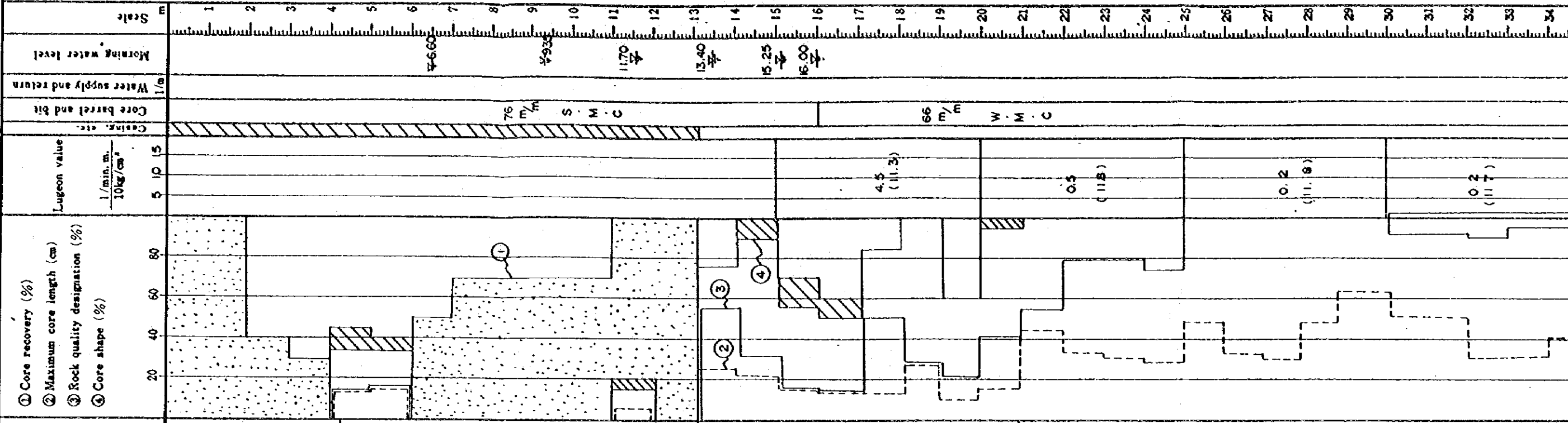
Fresh and hard rock. Lithologic character is almost the same as the above. But no alternation is found. Joints develop moderately and their planes have the discoloration.

Around the 60m in depth and deeper, rock becomes leucocratic and holocrystalline of 1-3m/m large olivine, pyroxene, hornblende and feldspar and becomes coarser.

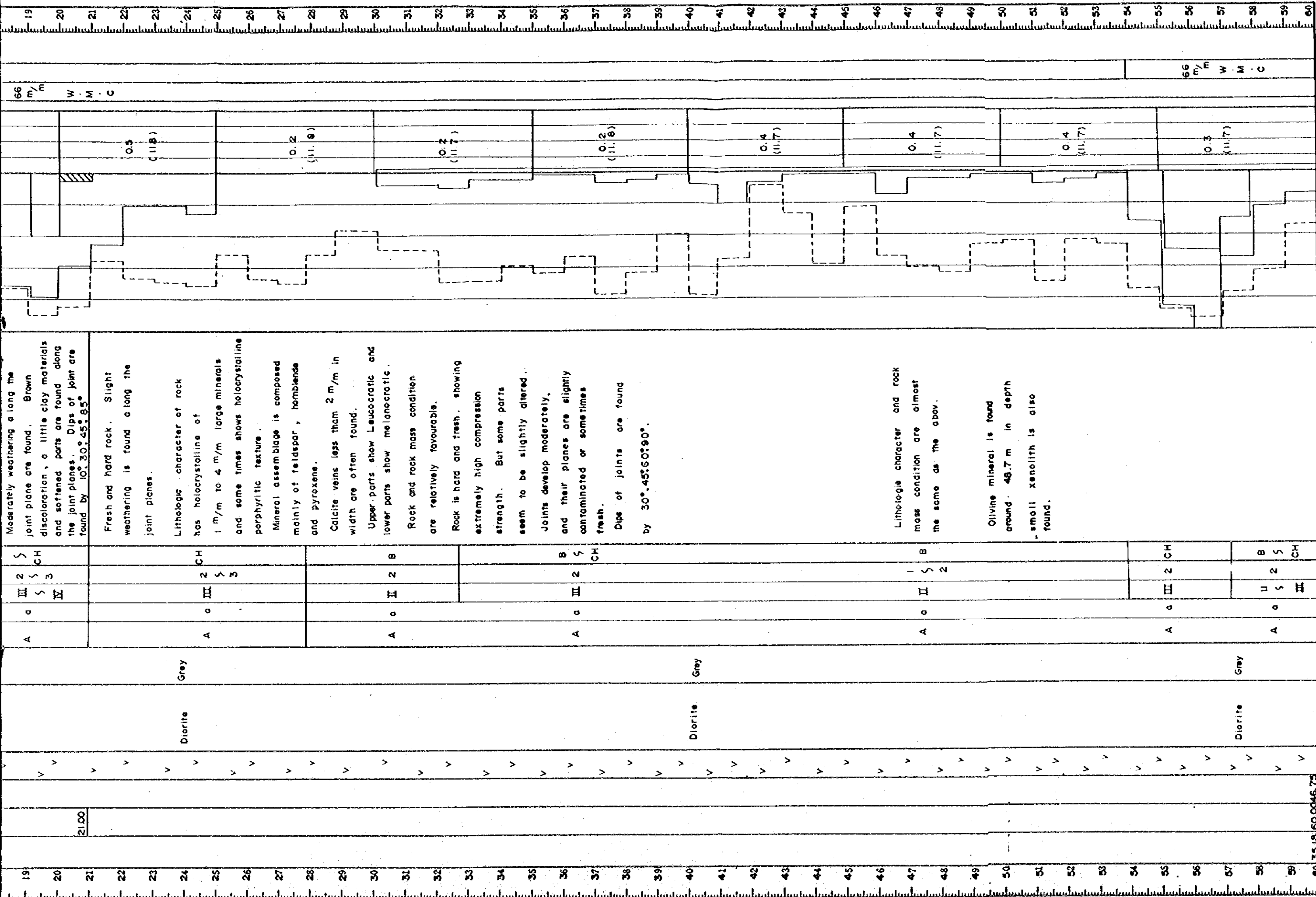
Rock mass condition is almost the same as the above. But poor recovery is partly found due to the poor method.

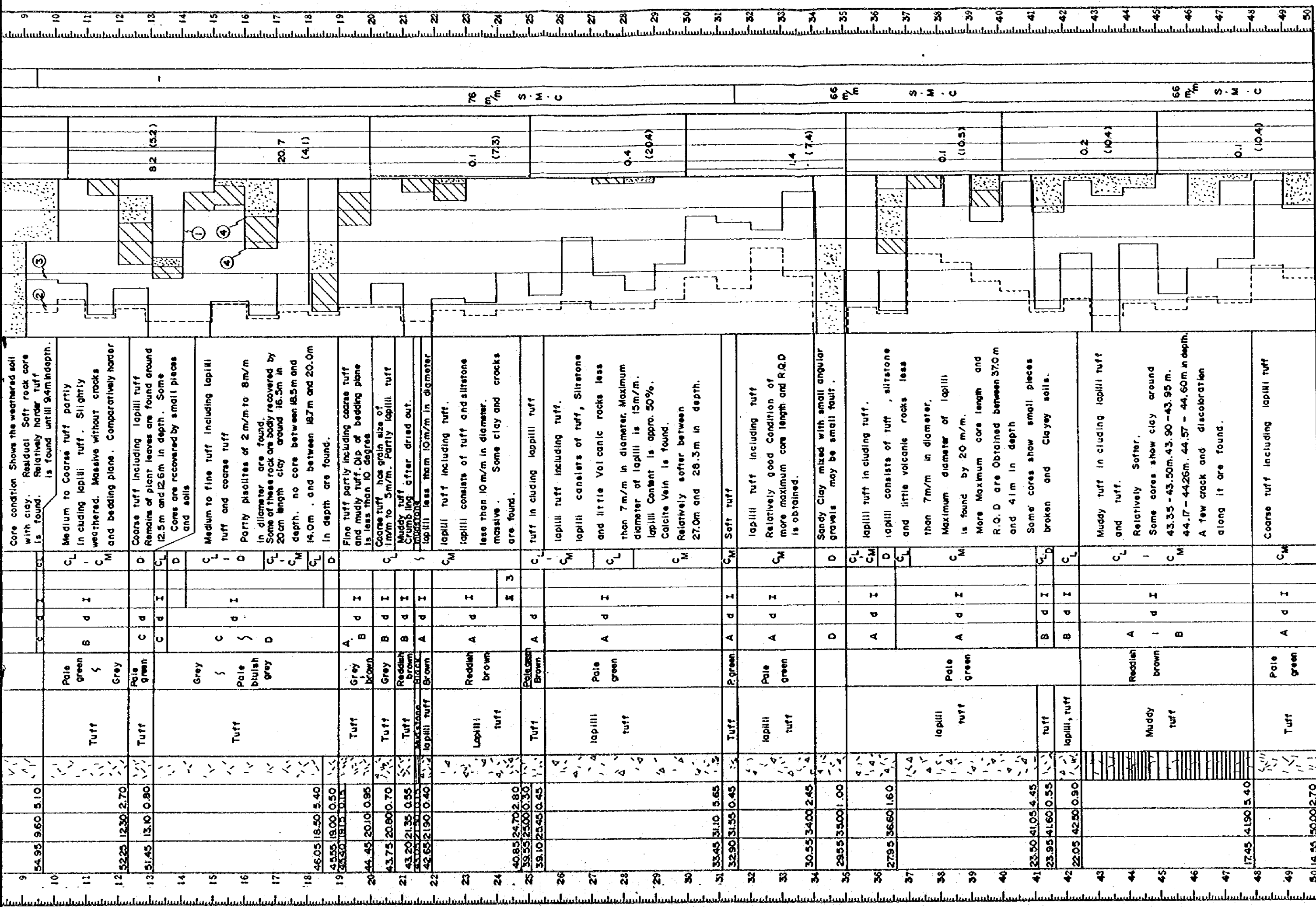
BORING LOG

PROJECT THE JENERANG RIVER FLOOD CONTROL (PHASE II)											
BOREHOLE NO. BR - 1		LOCATION AROUND ABUTMENT OF LEFTSIDE OF RIGHT WING DAM		DIAMETER OF HOLE 60.0 m		66.0 m		ORIENTATION 90°		DATE FROM 8 MAY TO 30 MAY 1981	
ELEVATION OF HOLE 95.28 m		DEPTH OF HOLE		CHECKED BY T. MURAKAMI		DATE		FROM 8 MAY TO 30 MAY 1981		DATE	
MACHINE ACKER		ACKER		CHECKED BY		DATE		FROM 8 MAY TO 30 MAY 1981		DATE	
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification element		Description	Lugeon value	
m	m	m	m	m	m	m	Weathering condition	Relative hardness	Spacing of joints	Relative condition	Classification of rock mass
m	m	m	m	m	m	m	m	m	m	m	m
1	90.98	4.30	4.30	X	Top soil	Dark brown					T - OS
2				v		Brown					
3				v		Brown					
4				v	Diorite	Yellow brown					
5				v	(Highly weathered)	Yellow brown					
6				v		Yellow grey					
7				v							
8				v							
9				v							
10				v							
11				v							
12				v							
13	82.03	13.25	8.95	v							
14				v							
15				v							
16				v							
17	17.00			v							
18				v							
19				v							
20				v							
21	21.00			v							
22				v							
23				v							
24				v	Diorite	Grey					
25				v							
26				v							
27				v							
28				v							
29				v							
30				v							
31				v							
32				v							
33				v							
34				v							



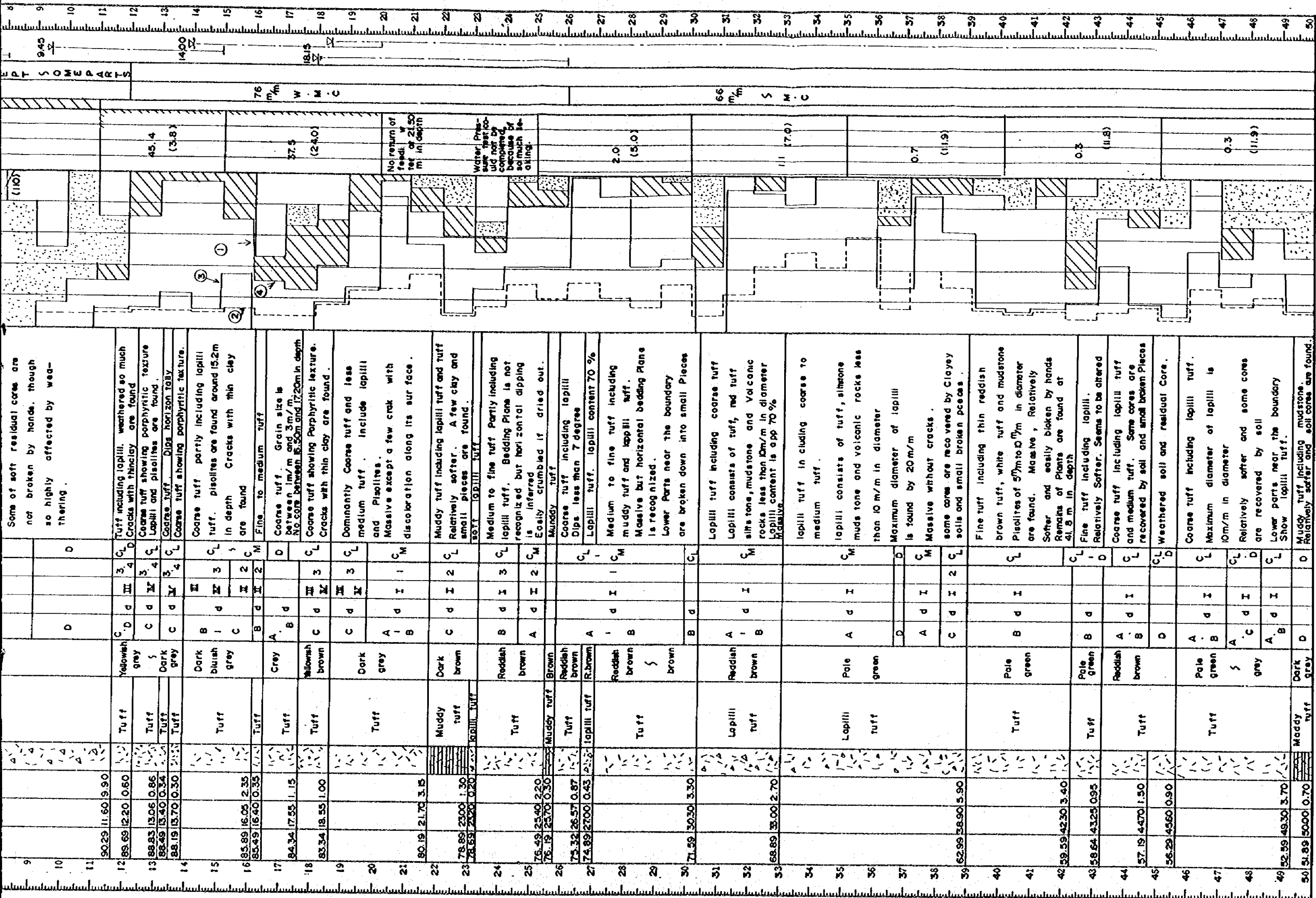
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification element		Description	Lugeon value	
m	m	m	m	m	m	m	Weathering condition	Relative hardness	Spacing of joints	Relative condition	Classification of rock mass
m	m	m	m	m	m	m	m	m	m	m	m
1	90.98	4.30	4.30	X	Top soil	Dark brown					T - OS
2				v		Brown					
3				v		Brown					
4				v	Diorite	Yellow brown					
5				v	(Highly weathered)	Yellow brown					
6				v		Yellow grey					
7				v							
8				v							
9				v							
10				v							
11				v							
12				v							
13	82.03	13.25	8.95	v							
14				v							
15				v							
16				v							
17	17.00			v							
18				v							
19				v							
20				v							
21	21.00			v							
22				v							
23				v							
24				v	Diorite	Grey					
25				v							
26				v							
27				v							
28				v							
29				v							
30				v							
31				v							
32				v							
33				v							
34				v							

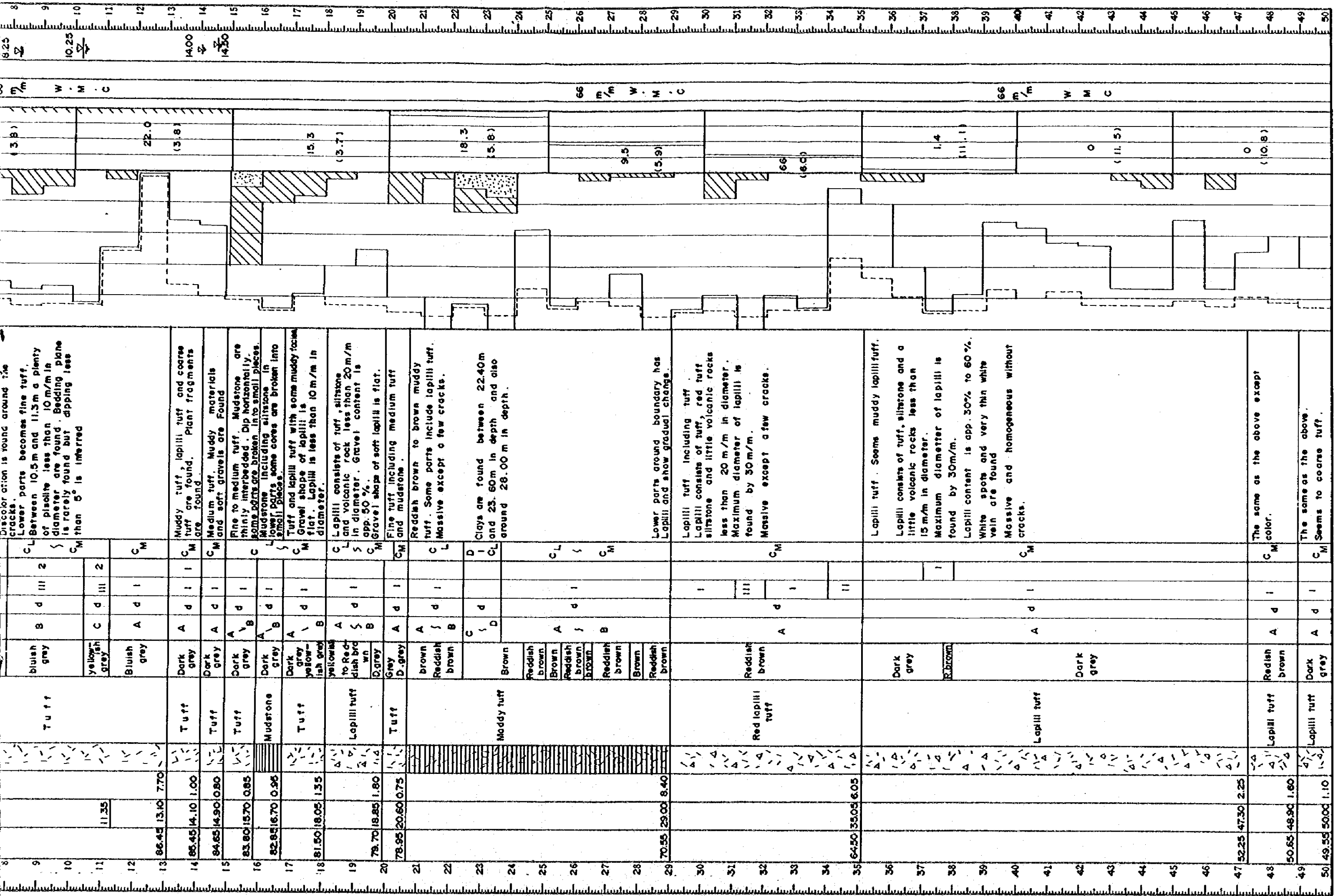




BORING LOG

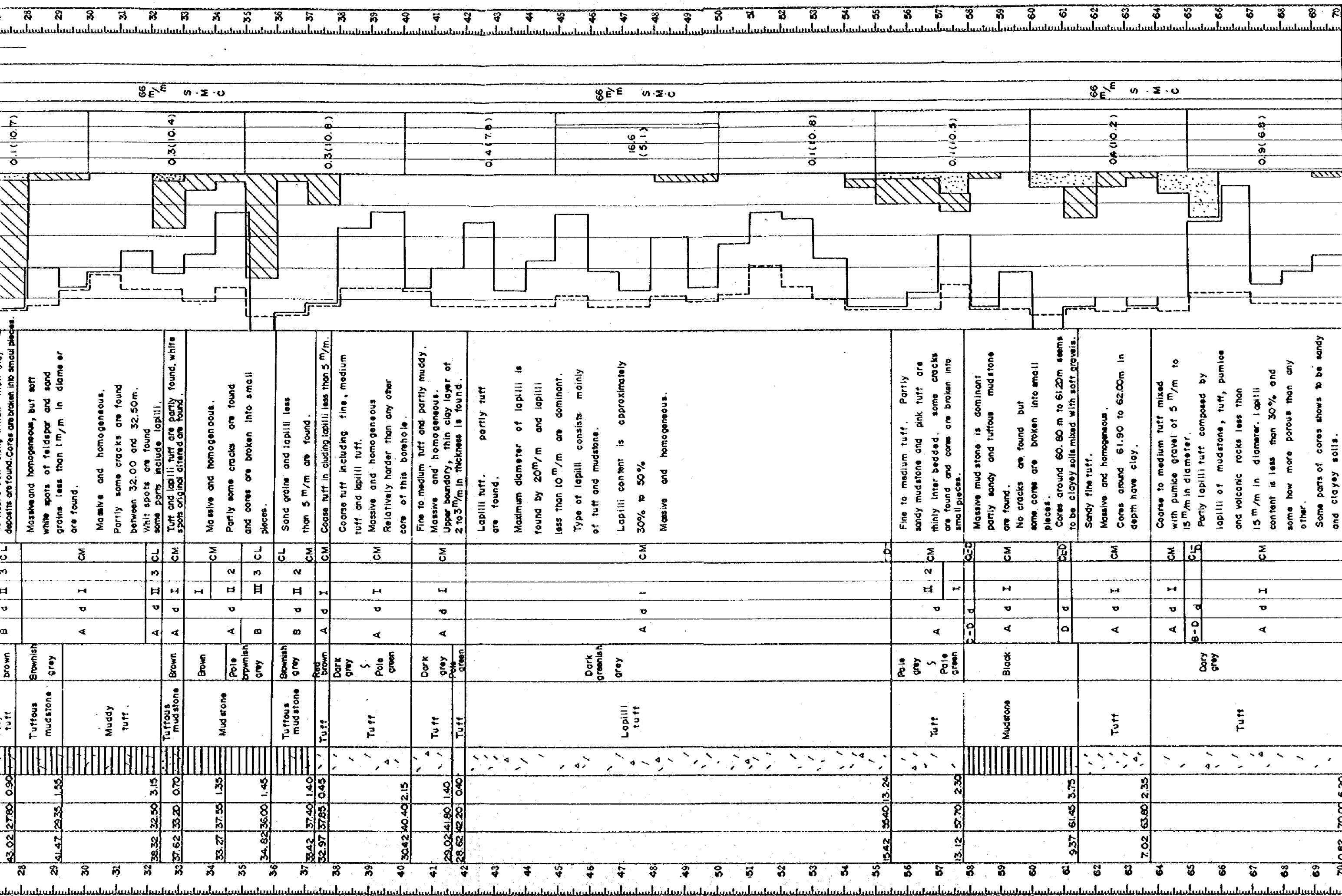
PROJECT			THE JENEBERANG RIVER FLOOD CONTROL (PHASE II)			LOCATION			AROUND ABUTMENT OF RIGHT SIDE OF RIGHT WING DAM			ORIENTATION												
BOREHOLE NO.			BR - 3			DEPTH OF HOLE			DIAMETER OF HOLE			90°												
ELEVATION OF HOLE			101.89			CHECKED BY			T. MURAKAMI			DATE												
MACHINE			SH									FROM 15 APRIL to 24 APRIL 1981												
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification element			Description			Lugeon value			Core barrel and bit			Water supply and return			Morning water level		
m	m	m	m				Weathering condition	Relative hardness	Spacing of joints	Relative condition along joint plane				1/min. m. / 10kg/cm ²			m			m				
1	101.49	0.40	0.40	▲	Sandy clay	B. brown					Top humus soil with some small gravels.						NO WATER DRILLING EXCEPT SOME STARTS							
2	100.19	1.70	1.30	▲	Tuff	Brown					Sandy clays mixed with hard boulder gravels less than 30cm in diameter. Inertite gravels of 3mm cross are sound.			NO OF S.P.T.			76 m ² /m S.M.C			600				
3				▲							Weathered clayey sandy soils mixed with soft small gravels due to highly weathering.			39										
4				▲							Mother rocks are inferred by Lapilli tuff including tuff.			51										
5				▲		Yellowish					Lapilli consists of soft tuff.			69										
6				▲	Lapilli	brown	D				siltstone and little Volcanic rocks less than 10m/m in diameter			69										
7				▲	tuff						Some of soft residual cores are found and easily broken into small pieces by hands.			35										
8				▲							Some of soft residual cores are not broken by hands, though so highly affected by weathering.			(110)										
9				▲																				
10				▲																				
11	90.29	11.60	9.90	▲	Tuff	Yellowish grey	C	III	3		Tuff including lapilli, weathered so much. Cracks with thin clay are found.													
12	89.69	12.20	0.60	▲	Tuff	grey	C	IV	3		Coarse tuff showing porphyritic texture. Lapilli and pisolites are found.			45.4 (3.8)										
13	88.83	13.06	0.86	▲	Tuff	Dark grey	C	IV	4		Coarse tuff. Dipa horizon tuff.													
14	88.19	13.70	0.30	▲	Tuff	Dark grey	C	IV	4		Coarse tuff showing porphyritic texture.													
15				▲	Tuff	Dark bluish grey	B	III	3		Coarse tuff partly including lapilli tuff. Pisolites are found around 15.2m in depth. Cracks with thin clay are found.													
16	85.89	16.05	2.35	▲	Tuff	Grey	B	II	2		Fine to medium tuff													
17	84.34	17.55	1.15	▲	Tuff	Grey	A	I	2		Coarse tuff. Grain size is between 1m/m and 3m/m. No core between 15.50m and 17.20m in depth.													
18	83.34	18.55	1.00	▲	Tuff	Yellowish brown	C	IV	3		Coarse tuff showing porphyritic texture. Cracks with thin clay are found.													
19				▲	Tuff	Dark grey	C	IV	3		Dominantly coarse tuff and less medium tuff. Include lapilli and pisolites.													
20				▲	Tuff	Dark grey	A	I	1		Massive except a few cracks with discoloration along its surface.													
21				▲	Tuff	Dark grey	A	I	1															
22	80.19	21.70	3.15	▲	Muddy tuff	Dark brown	C	I	2		Muddy tuff including lapilli tuff and tuff relatively softer. A few clay and small pieces are found.													
23	78.89	23.00	1.30	▲	Muddy tuff	Dark brown	C	I	2		Medium to fine tuff partly including lapilli tuff. Bedding plane is not recognized but horizontal dipping is inferred.													
24	78.69	23.20	0.20	▲	Muddy tuff	Dark brown	A	I	2		Easily crumbled if dried out.													
25	76.49	25.40	2.20	▲	Muddy tuff	Brown	A	I	2															
26	76.19	25.70	0.30	▲	Tuff	Reddish brown	A	I	2		Coarse tuff including lapilli													
27	73.32	26.57	0.87	▲	Lapilli tuff	Reddish brown	A	I	1		Dips less than 7 degree. Lapilli tuff. Lapilli content 70 %.													
28	74.89	27.00	0.43	▲	Tuff	Reddish brown	A	I	1		Medium to fine tuff including muddy tuff and lapilli tuff.													
29				▲	Tuff	Reddish brown	B				Massive but horizontal bedding plane is recognized.													
30	71.59	30.30	3.30	▲	Tuff	Reddish brown	B				Lower parts near the boundary are broken down into small pieces.			2.0 (5.0)										
31				▲	Lapilli tuff	Reddish brown	A	I	1		Lapilli tuff including coarse tuff.													
32				▲	Tuff	Reddish brown	A	I	1		Lapilli consists of tuff, red tuff siltstone, mudstone and volcanic rocks less than 10m/m in diameter.													
33	68.89	33.00	2.70	▲	Tuff	Reddish brown	B				Lapilli content is approx 70 %.													
				▲	Tuff	Reddish brown	A				Lapilli tuff including coarse to massive.													





BORING LOG

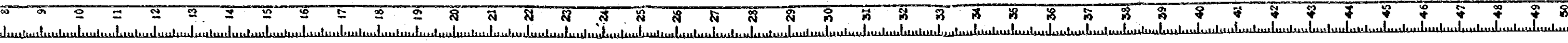
PROJECT - THE JENEBERANG RIVER FLOOD CONTROL (PHASE II)															
BOREHOLE NO.		LOCATION		AROUND CENTER BASE OF RIGHT WING DAM		ORIENTATION		90°							
ELEVATION OF HOLE	70.82	DEPTH OF HOLE	70	DIAMETER OF HOLE	66	FROM 5 APRIL TO 19 APRIL 1981									
MACHINE	T. D. H		CHECKED BY	T. MURAKAMI		DATE									
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification element		Description	Lugeon value		Core barrel and bit	Water supply and return	Morning water level	Scale
1	69.42	1.40	1.40	X	Sandy clay	Yellowish brown	Weathering condition	Spacing of joints	Relative condition along joint plane	Classification of rock mass	1/min. m. / 10kg/cm ²		76 m/m S.M.C	1/1.20	1
2				A			C				2		2.22	2	
3				A	Lapilli	pale greenish grey	A	d	I	CM	3		5.70	3	
4				A	tuff	grey	A	d	I	CM	4		6.40	4	
5				A			A	d	I	CM	5		7.10	5	
6				A			A	d	I	CM	6		7.80	6	
7				A			A	d	I	CM	7		8.50	7	
8				A			A	d	I	CM	8		9.20	8	
9				A			A	d	I	CM	9		9.90	9	
10				A			A	d	I	CM	10		10.60	10	
11				A			A	d	I	CM	11		11.30	11	
12				A			A	d	I	CM	12		12.00	12	
13				A			A	d	I	CM	13		12.70	13	
14				A			A	d	I	CM	14		13.40	14	
15				A			A	d	I	CM	15		14.10	15	
16				A			A	d	I	CM	16		14.80	16	
17				A			A	d	I	CM	17		15.50	17	
18				A			A	d	I	CM	18		16.20	18	
19				A			A	d	I	CM	19		16.90	19	
20				A			A	d	I	CM	20		17.60	20	
21				A			A	d	I	CM	21		18.30	21	
22				A			A	d	I	CM	22		19.00	22	
23	47.62	23.20	21.80	A			A	d	I	CM	23		19.70	23	
24				A			A	d	I	CM	24		20.40	24	
25				A			A	d	I	CM	25		21.10	25	
26	44.67	26.15	2.95	A	Mudstone	Grey	A	d	I	CM	26		21.80	26	
27	43.92	26.90	0.75	A	Muddy tuff	Reddish brown	B	d	II	3 CL	27		22.50	27	
28	43.02	27.80	0.90	A	Tuffous mudstone	Brownish grey	B	d	II	3 CL	28		23.20	28	
29	41.47	29.35	1.55	A			A	d	I	CM	29		23.90	29	
30				A			A	d	I	CM	30		24.45	30	
31				A			A	d	I	CM	31		25.00	31	
32	38.32	32.50	3.15	A	Muddy tuff		A	d	II	3 CL	32		25.55	32	
33	37.62	33.20	0.70	A	Tuffous mudstone	Brown	A	d	I	CM	33		26.20	33	
34				A			A	d	I	CM	34		26.90	34	



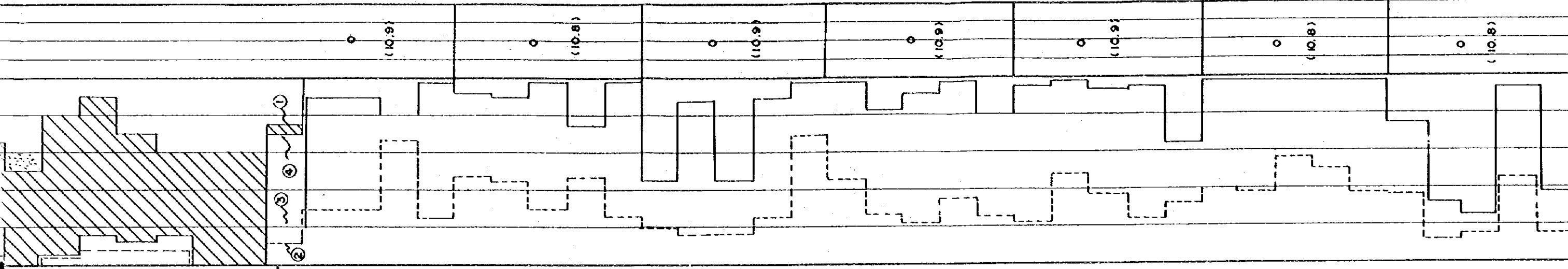
BORING LOG

PROJECT			THE JENEBERANG RIVER FLOOD CONTROL (PHASE II)					LOCATION		DIAMETER OF HOLE		ORIENTATION			
BOREHOLE NO.			BL - 3					AROUND ABUTMENT OF RIGHT SIDE OF LEFT WING DAM		50 m		66 m			
ELEVATION OF HOLE			99.47 m					DEPTH OF HOLE		50 m		90°			
MACHINE			T. D. H					CHECKED BY		T. MURAKAMI		DATE			
												FROM 2 MAY TO 14 MAY 1981			
Scale	Elevation	Depth	Thickness	Log	Rock type	Colour	Classification of rock mass			Description	Core recovery (%)	Lugeon value l/min. m. 10kg/cm ²	Core barrel and bit	Water supply and return	Morning water level
							Weathering condition	Relative hardness	Spacing of joints						
1	96.97	2.50	2.50	X	Top soil (Clay with gravel)	Brown				S					
2			V		Diabase	Brown	D			D					
3			V		Highly weathered Diabase	Pale brown									
4	93.97	5.50	3.00	V											
5			V												
6			V												
7			V												
8			V												
9			V												
10			V												
11			V												
12			V												
13			V												
14			V												
15	15.30		V												
16			V												
17			V												
18			V												
19			V												
20			V												
21			V												
22			V												
23			V												
24			V												
25			V												
26			V												
27			V												
28			V												
29			V												
30			V												
31			V												
32			V												
33			V												

Some alternation of rock between



66 m/m W.M.C. 66 m/m W.M.C. 66 m/m S.M.C.



The core of sandy soils between 8.4m and 8.7m in depth is recovered by no water drilling.

Fresh rock has porphyritic texture consisting of 2 m/m to 3 m/m large hornblende and pyroxene and 1 m/m large olivine mineral. Joints develop and are weathered so much along their planes.

Fresh and very hard rock has porphyritic texture. Consisting of 2 to 3 m/m large hornblende and pyroxene and 1 m/m large olivine mineral.

Joint spacing is 10 to 50 cm and a little deflection of weathering along the joint planes are found

Brown color discoloration along the joint plane is not found

Fine calcite veins are found along the joint planes.

Dip of joint planes are mostly found by 10° , 30° , 60° and 75°

Some attrition of rock between 33.8 m and 35.30 m in depth are found to be softened.

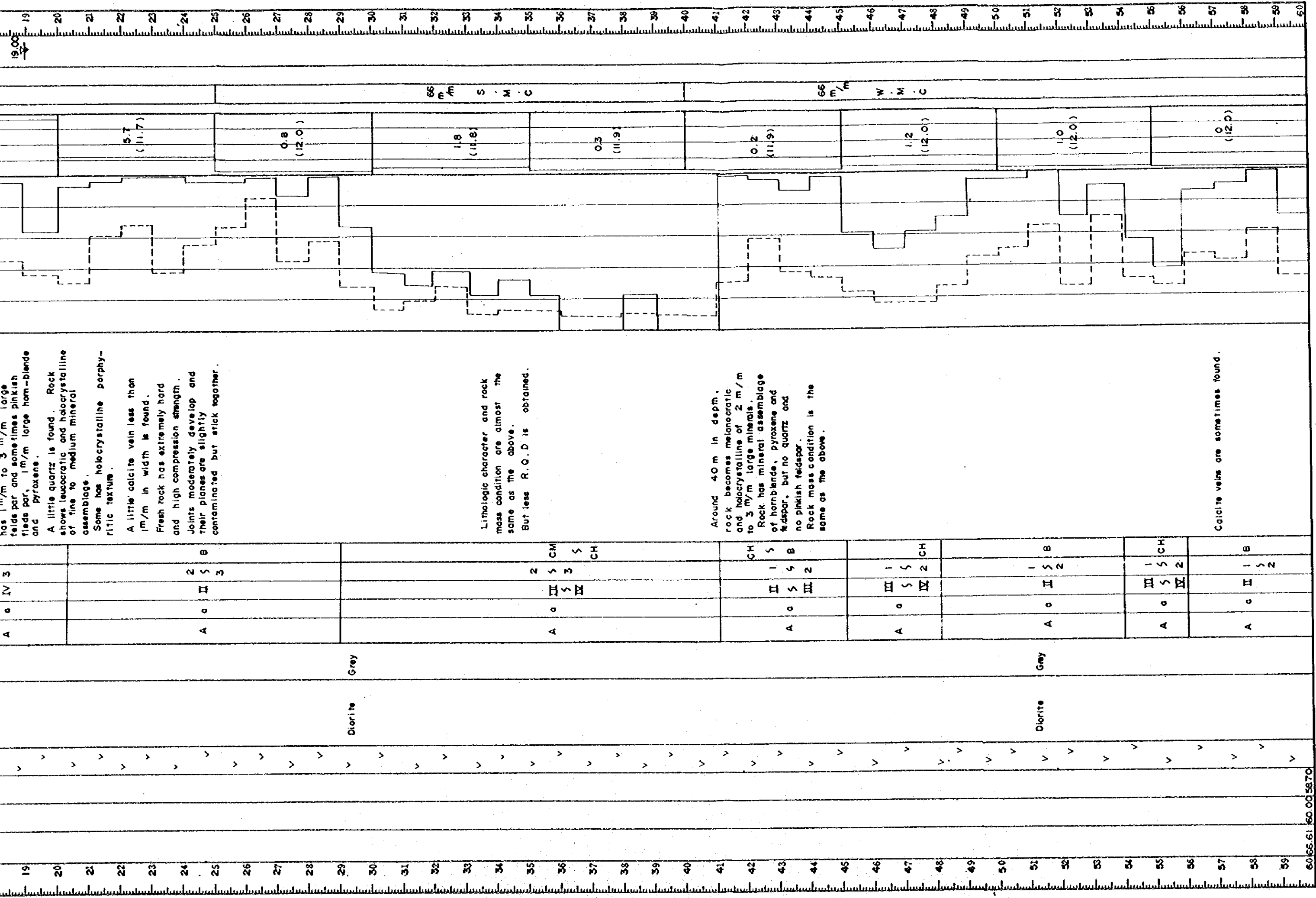
Lithologic character and rock mass condition are almost the same as the above.

Diabase	Diabase	Diabase	Diabase	Diabase
S	S	S	S	S
grey	grey	grey	grey	grey
B	A	A	A	A
b	a	a	a	a
S	III	III	III	III
S	S	S	S	S
d	d	d	d	d
IV	IV	IV	IV	IV
4	2	2	2	2
C _M	C _H	C _H	C _H	C _H
C _L	C _H	C _H	C _H	C _H

15.30

50 49.47 5000 44.50





has 1m/m to 3 m/m large feldspar and sometimes pinkish feldspar, 1m/m large horn-blende and Pyroxene.

A little quartz is found. Rock shows leucocratic and holocrystalline of fine to medium mineral assemblage.

Some has holocrystalline porphyritic texture.

A little calcite vein less than 1m/m in width is found.

Fresh rock has extremely hard and high compression strength.

Joints moderately developed and their planes are slightly contaminated but stick together.

Lithologic character and rock mass condition are almost the same as the above.

But less R.O.D is obtained.

Around 40 m in depth, rock becomes melanocratic and holocrystalline of 2 m/m to 3 m/m large minerals.

Rock has mineral assemblage of horn-blende, pyroxene and feldspar, but no quartz and no pinkish feldspar.

Rock mass condition is the same as the above.

Calcite veins are sometimes found.