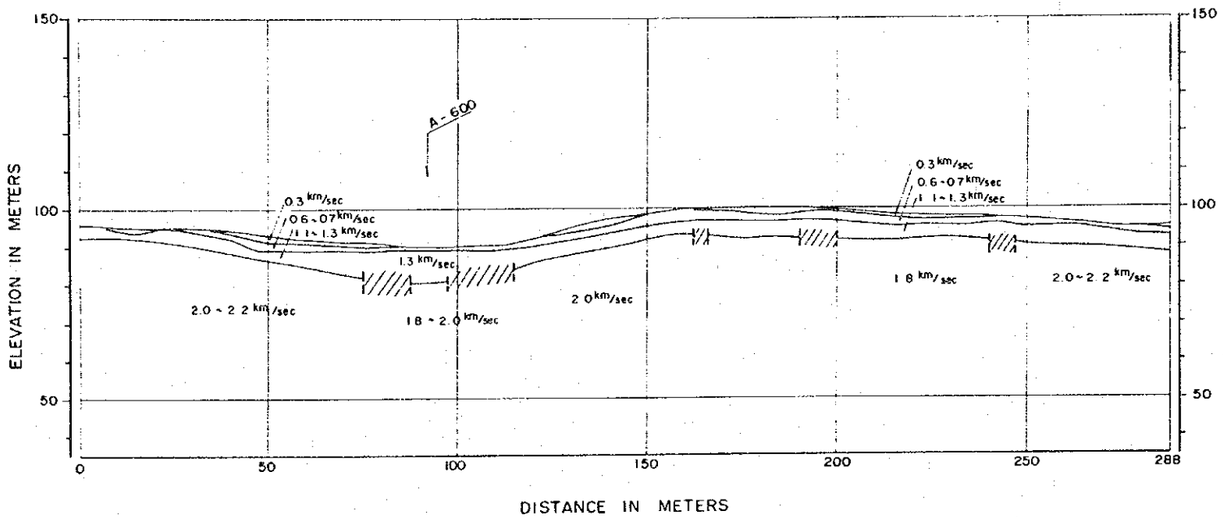
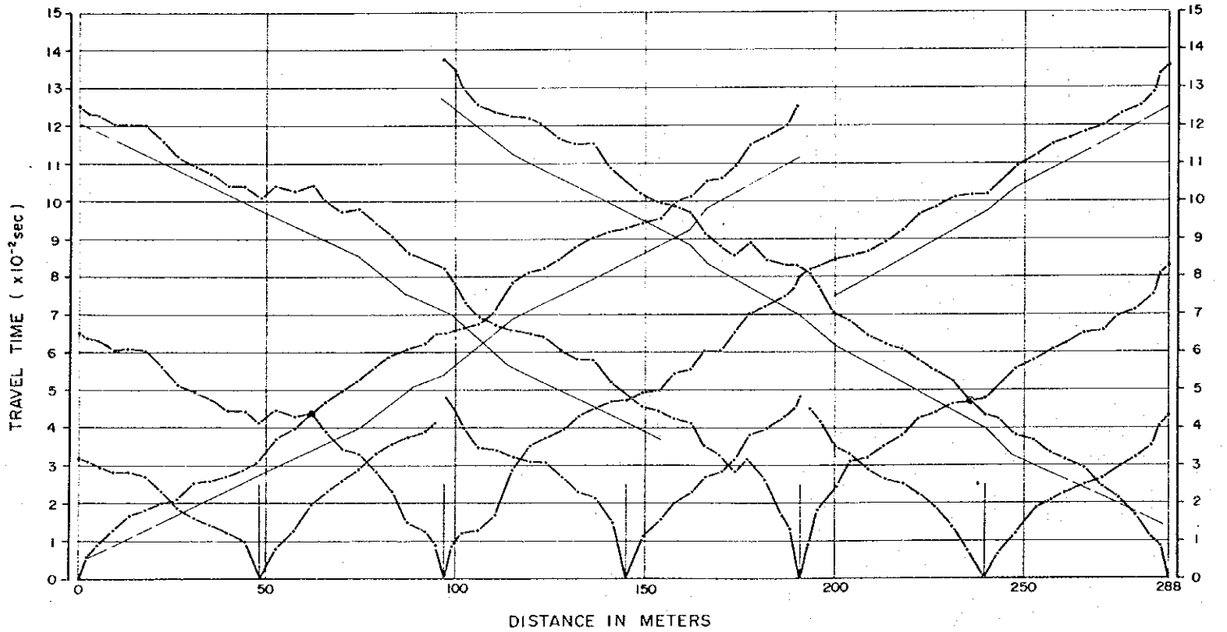
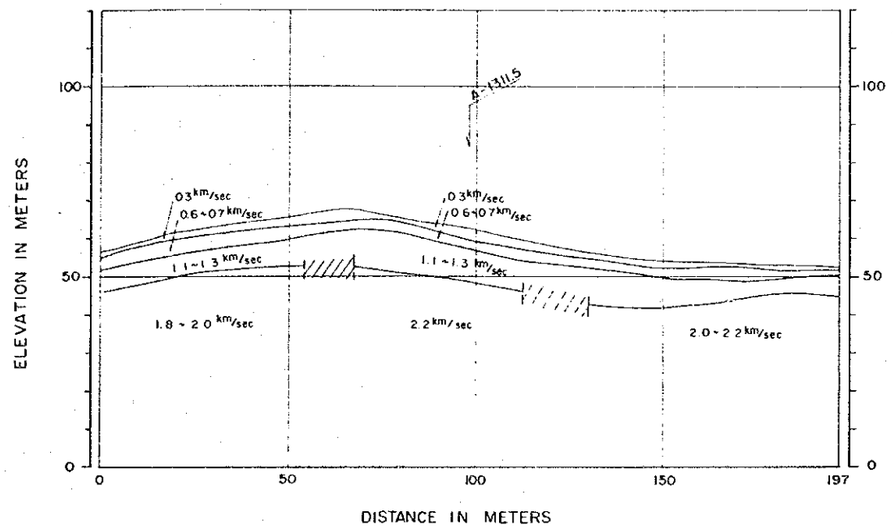
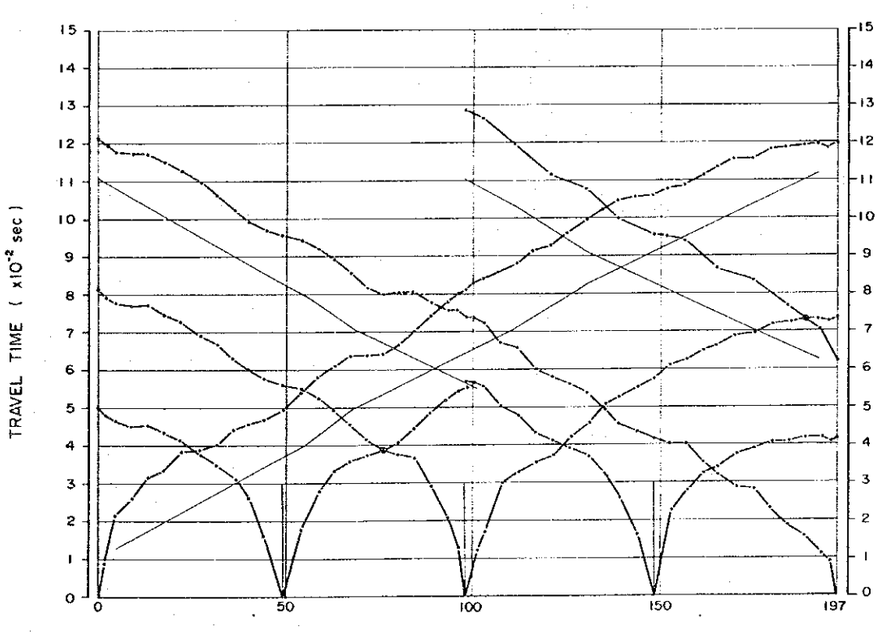
KARIAN - CIUYAH TUNNEL - D LINE





KARIAN - CIUYAH TUNNEL - E LINE





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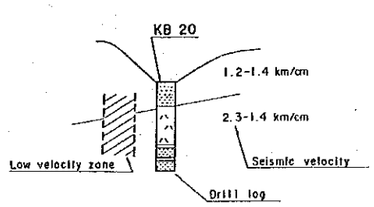

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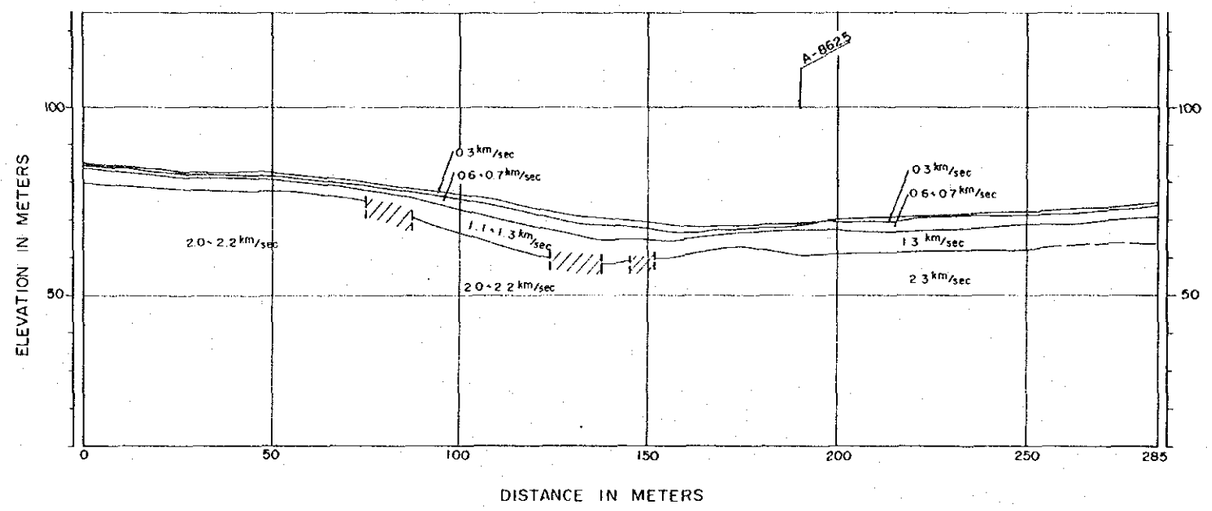
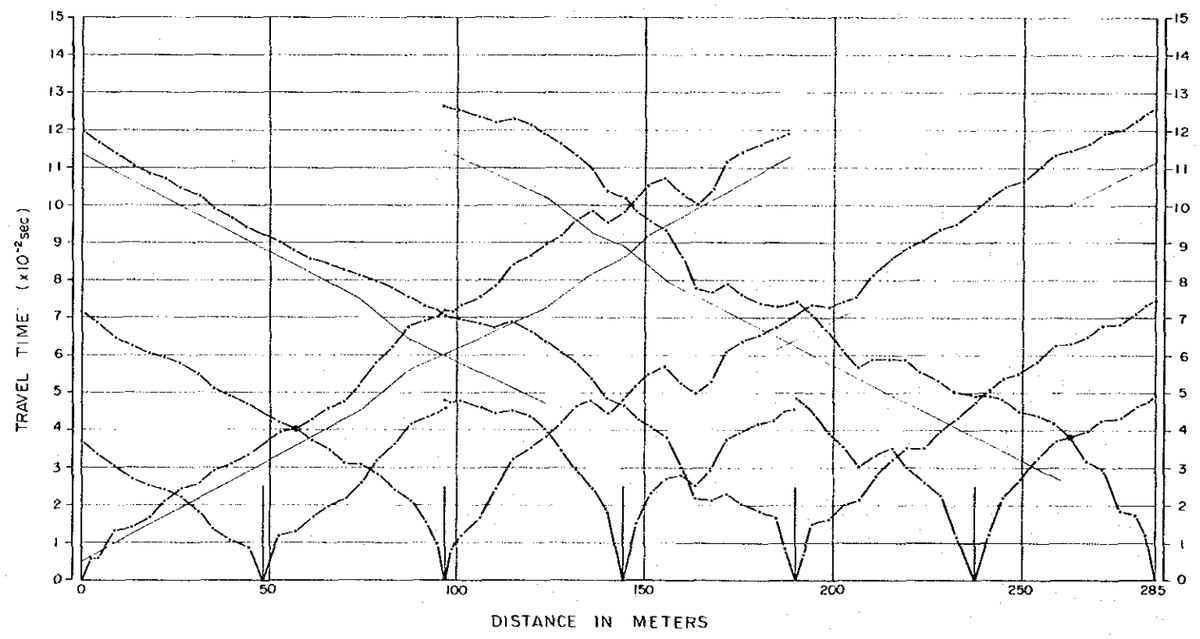
Geophysical Profile of Karian - Ciuyah Tunnel (Line A,B,C,D,E,F and G) (5/7)

JAPAN INTERNATIONAL COOPERATION AGENCY

KARIAN - CIUYAH. TUNNEL - F LINE





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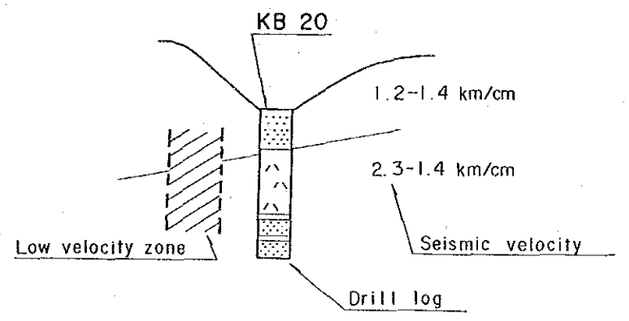

MINISTRY OF PUBLIC WORKS
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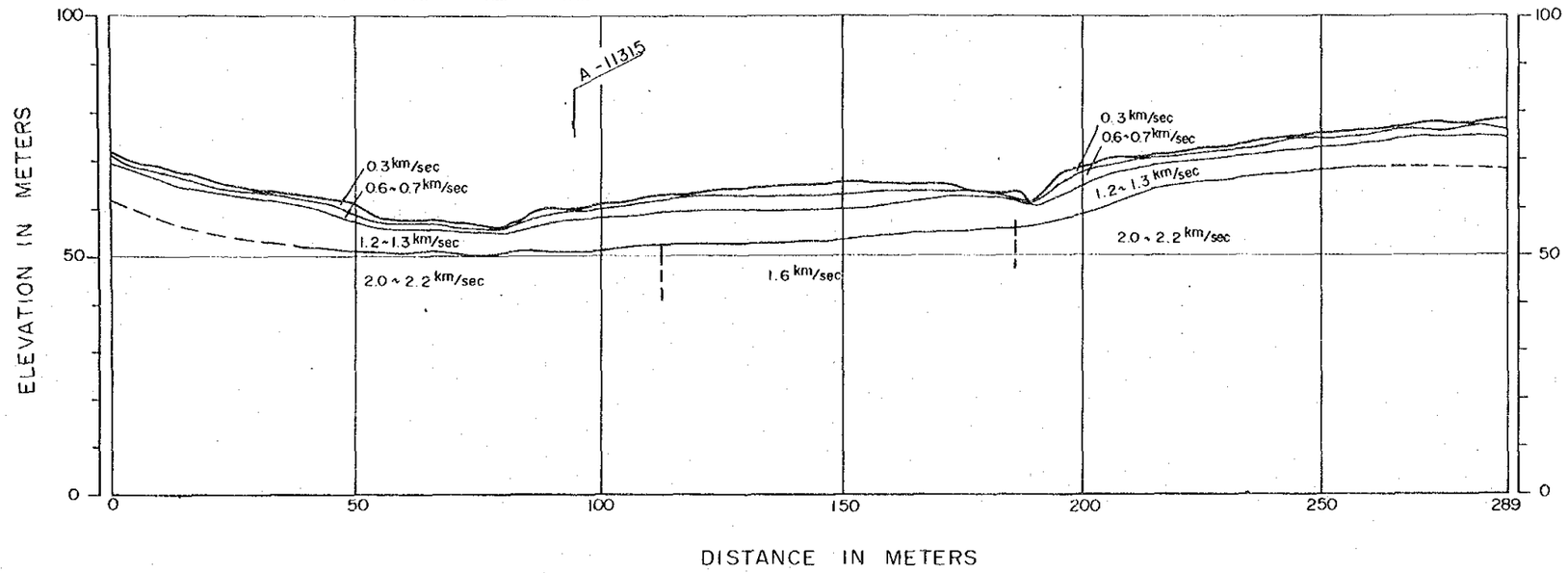
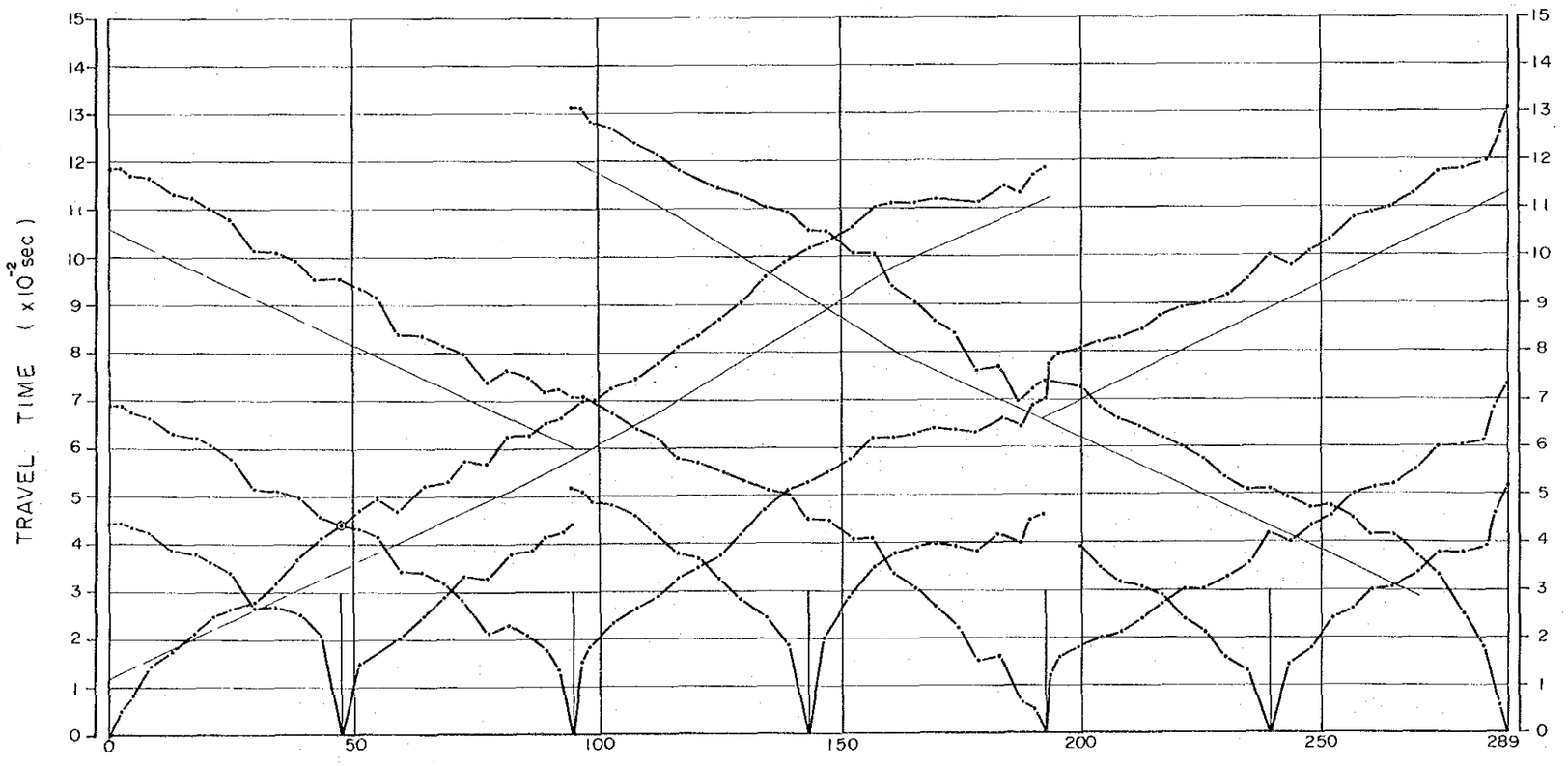
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Geophysical Profile of Karian - Ciuyah Tunnel (Line A,B,C,D,E,F and G) (6/7)

JAPAN INTERNATIONAL COOPERATION AGENCY

KARIAN-CIUYAH TUNNEL - G LINE





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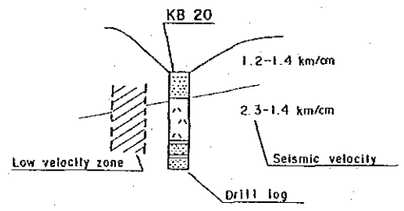

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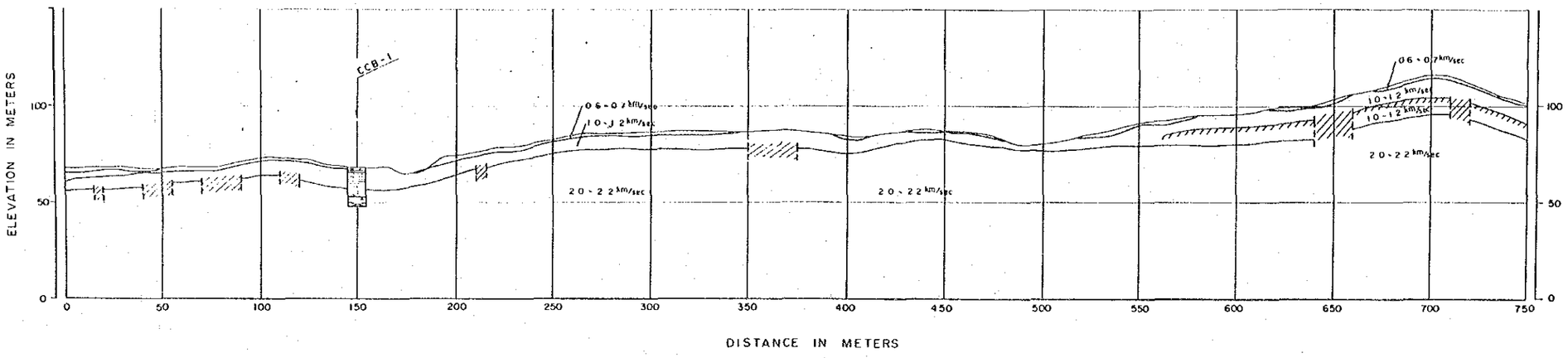
MULTIPURPOSE DAM CONSTRUCTION PROJECT

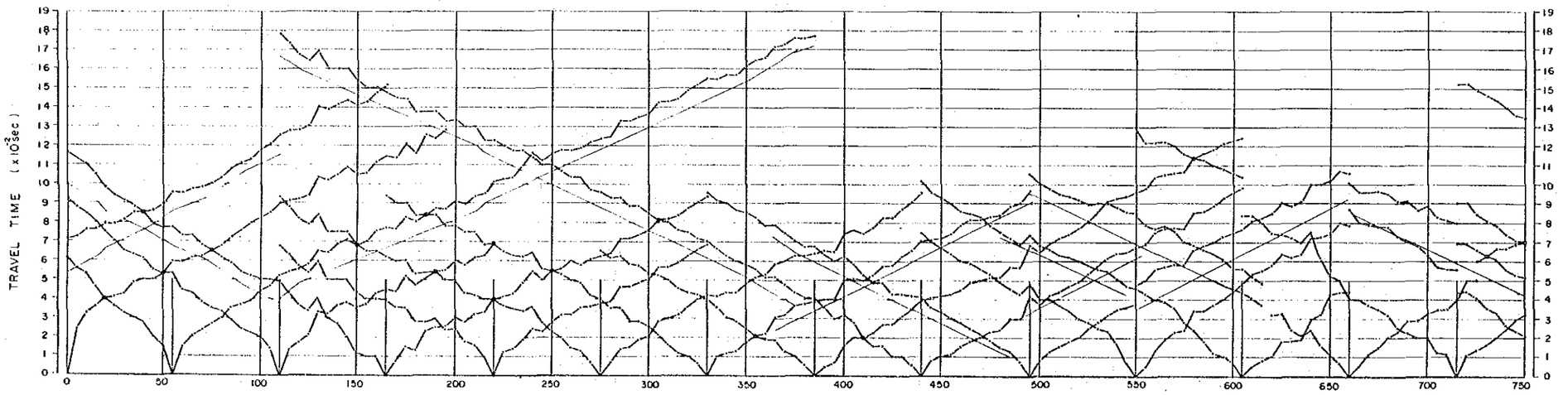
Geophysical Profile of Karian - Ciuyah Tunnel (Line A,B,C,D,E,F and G) (7/7)

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-20

CILAWANG - CICINT TUNNEL - A LINE (1/3)





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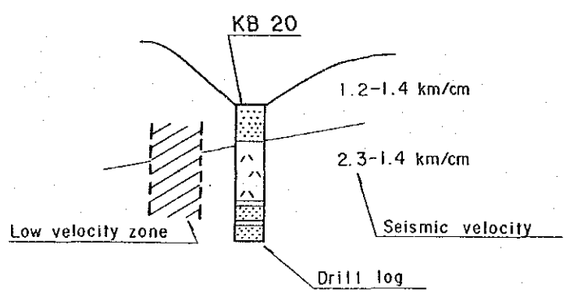

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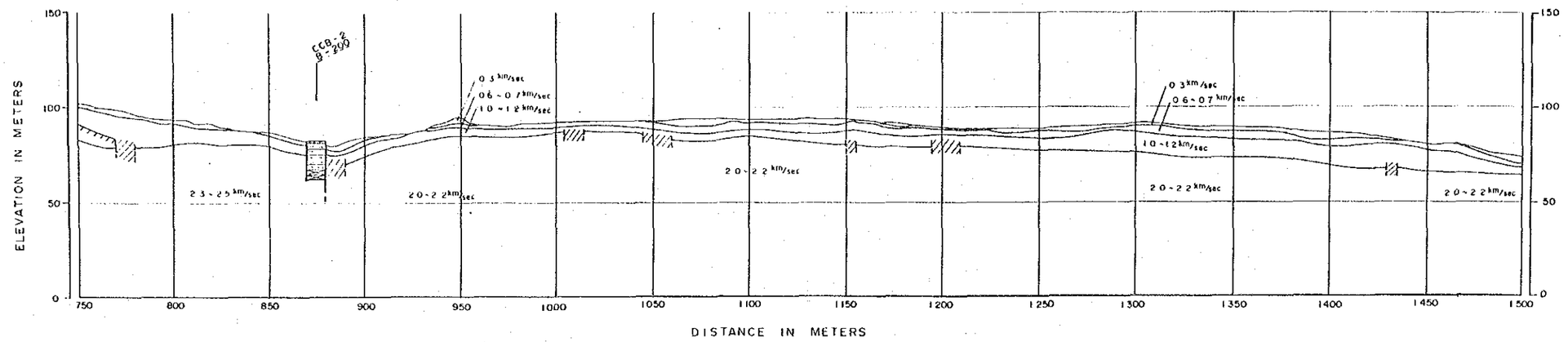
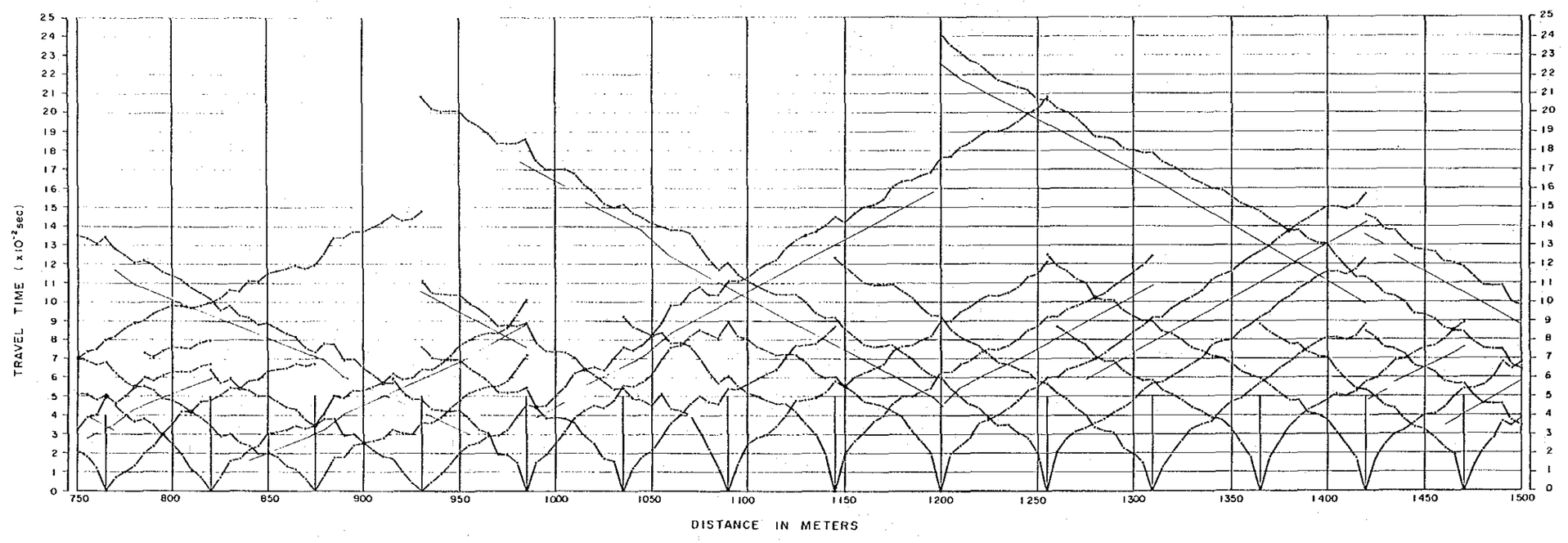
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
FEASIBILITY STUDY ON KARIAN MULTIPURPOSE DAM CONSTRUCTION PROJECT

Geophysical Profile of Cilawang - Cicinta Tunnel (Line A,B,C) (1/4)

JAPAN INTERNATIONAL COOPERATION AGENCY

CILAWANG - CICNTA - TUNNEL - A LINE (2/3)





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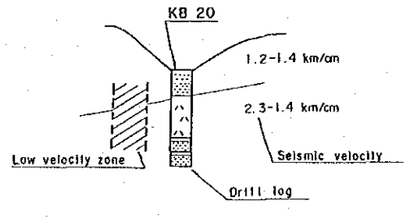

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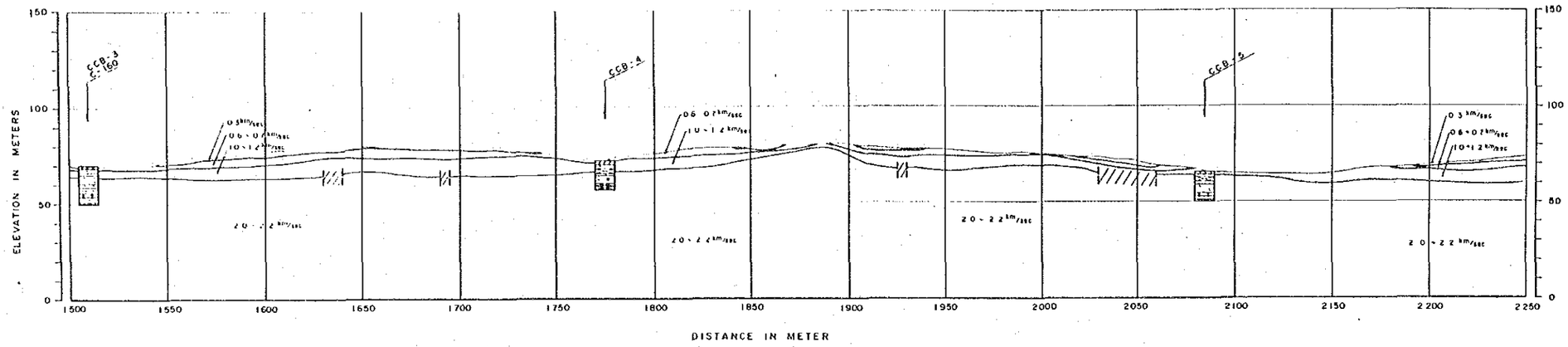
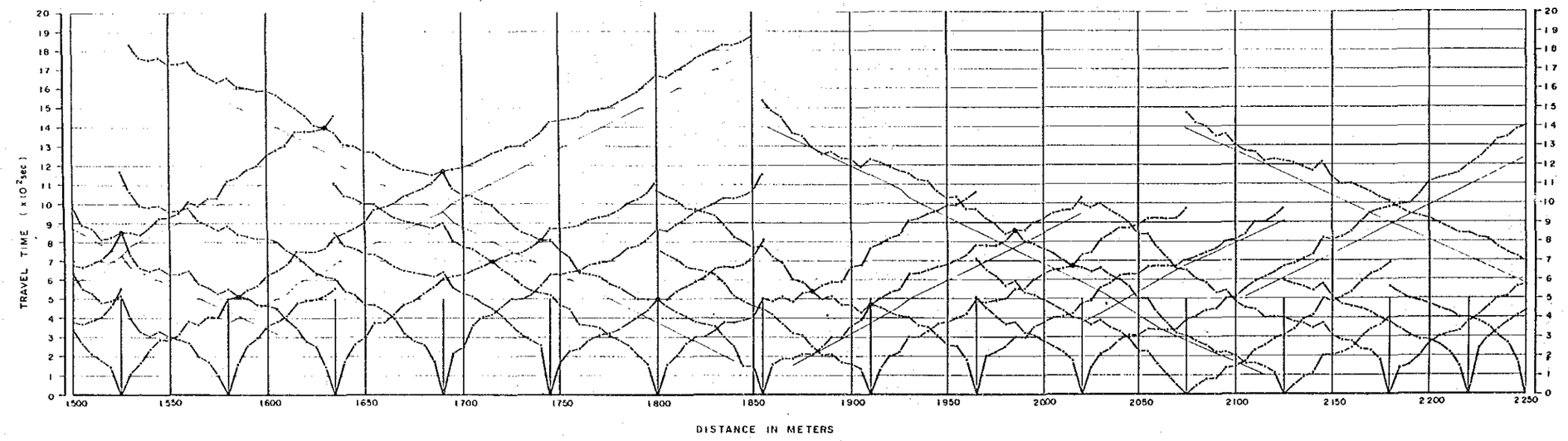
FEASIBILITY STUDY ON KARIAN MULTIPURPOSE DAM CONSTRUCTION PROJECT

Geophysical Profile of Cilawang - Cicinta Tunnel (Line A,B,C) (2/4)

JAPAN INTERNATIONAL COOPERATION AGENCY

CILAWANG - CICINTA TUNNEL - A LINE (3/3)





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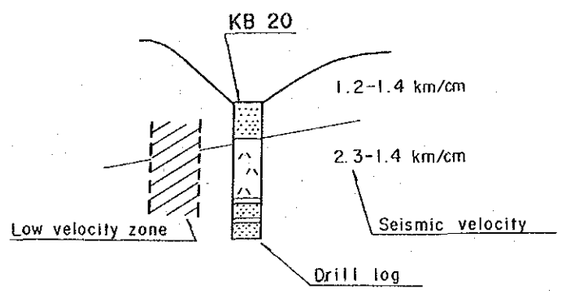

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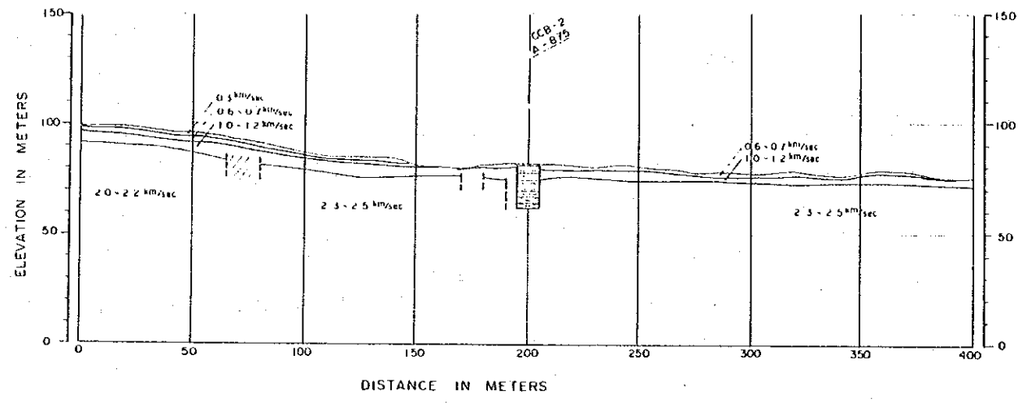
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Geophysical Profile of Cilawang - Cicinta Tunnel (Line A,B,C) (3/4)

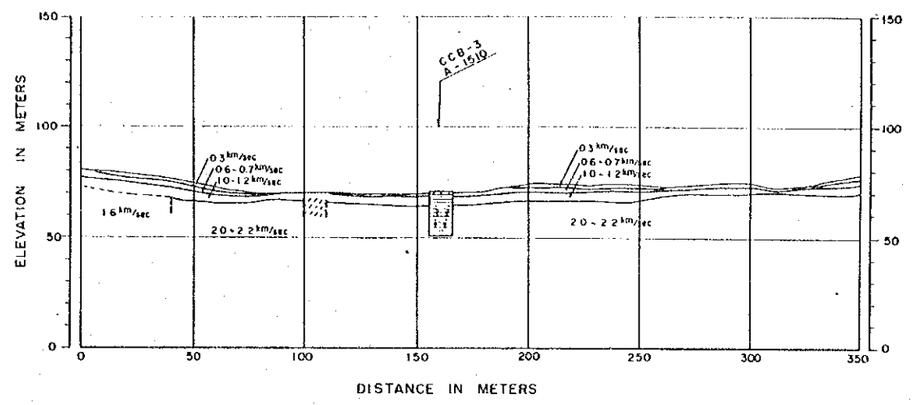
JAPAN INTERNATIONAL COOPERATION AGENCY

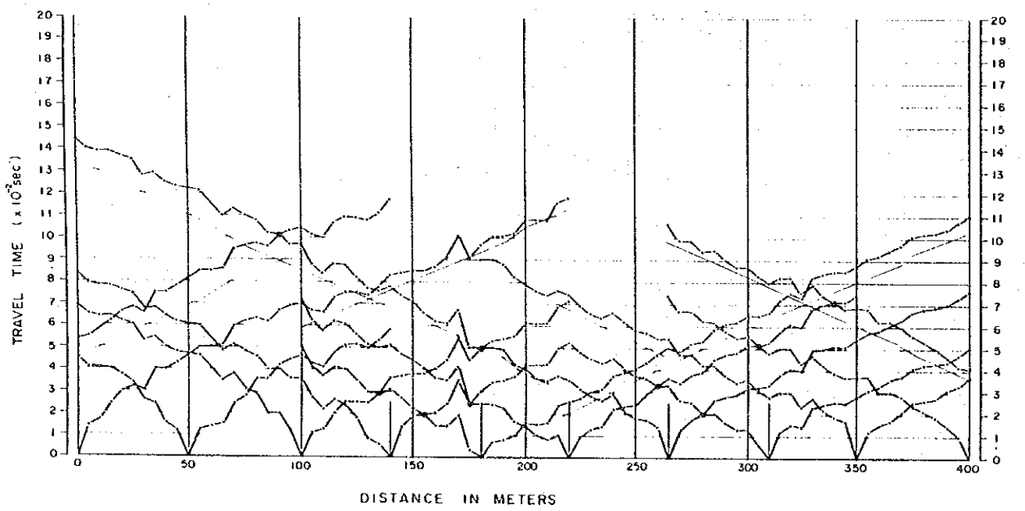
Fig.C-20

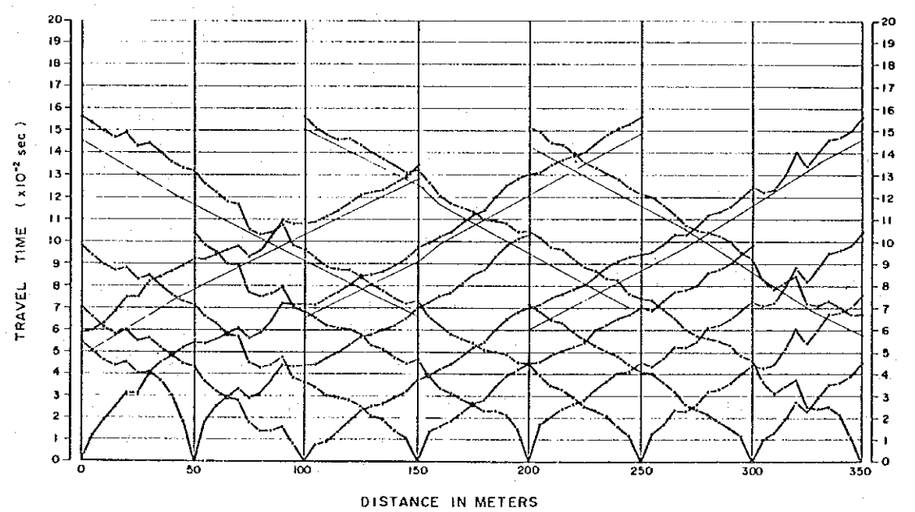
CILAWANG - CICINTA TUNNEL - B LINE



CILAWANG CICINTA TUNNEL - C LINE







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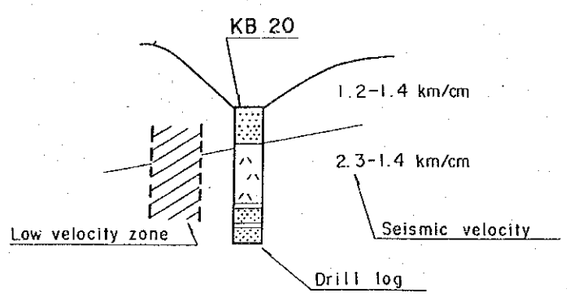

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Geophysical Profile of Cilawang - Cicinta Tunnel (Line A,B,C) (4/4)

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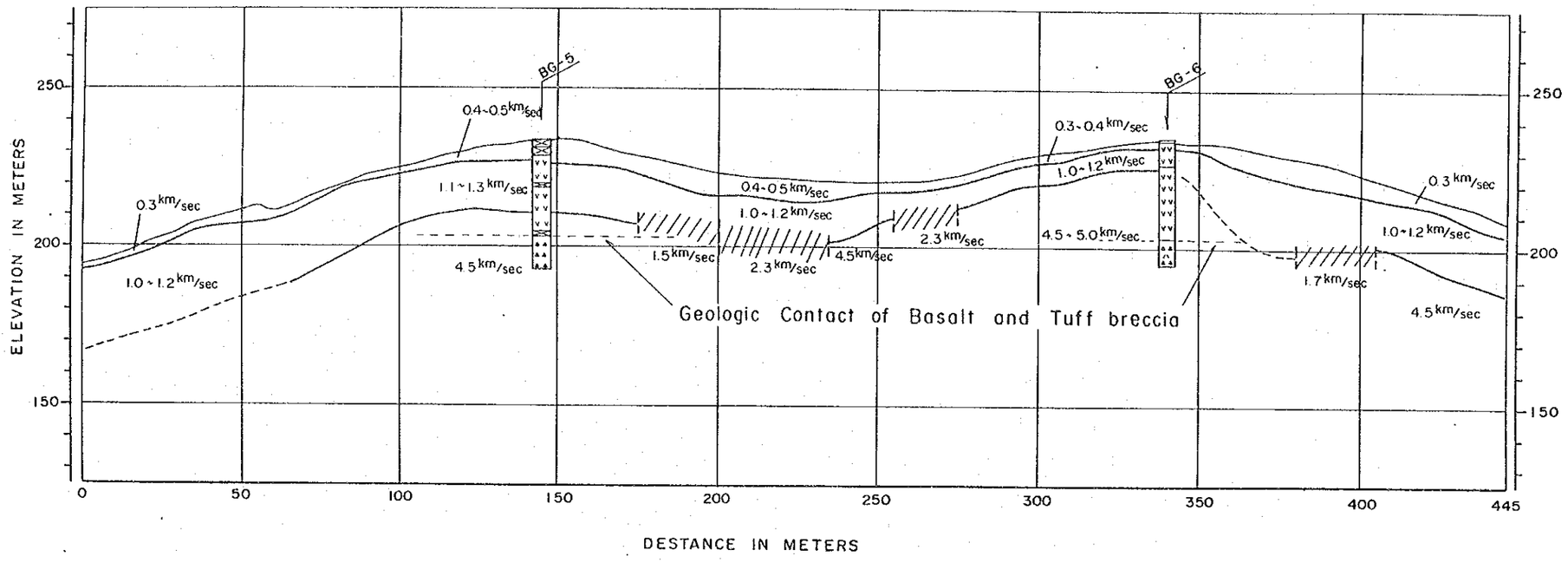
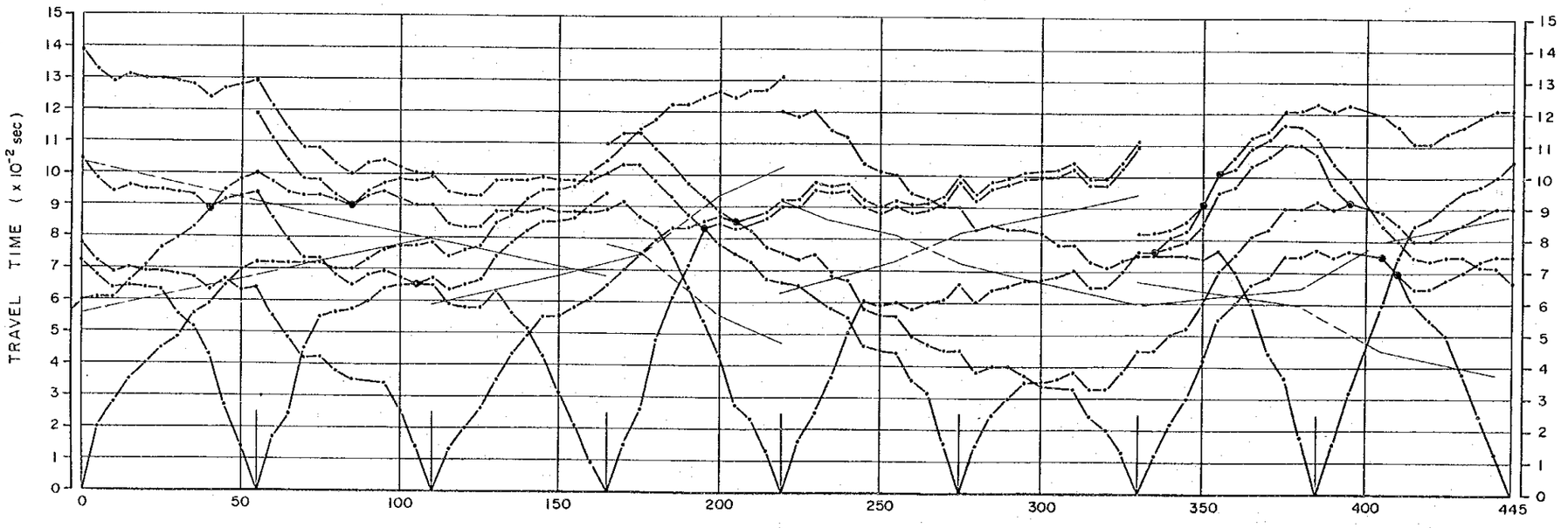
Fig.C-21

GURADOG QUARRY SITE-A LINE





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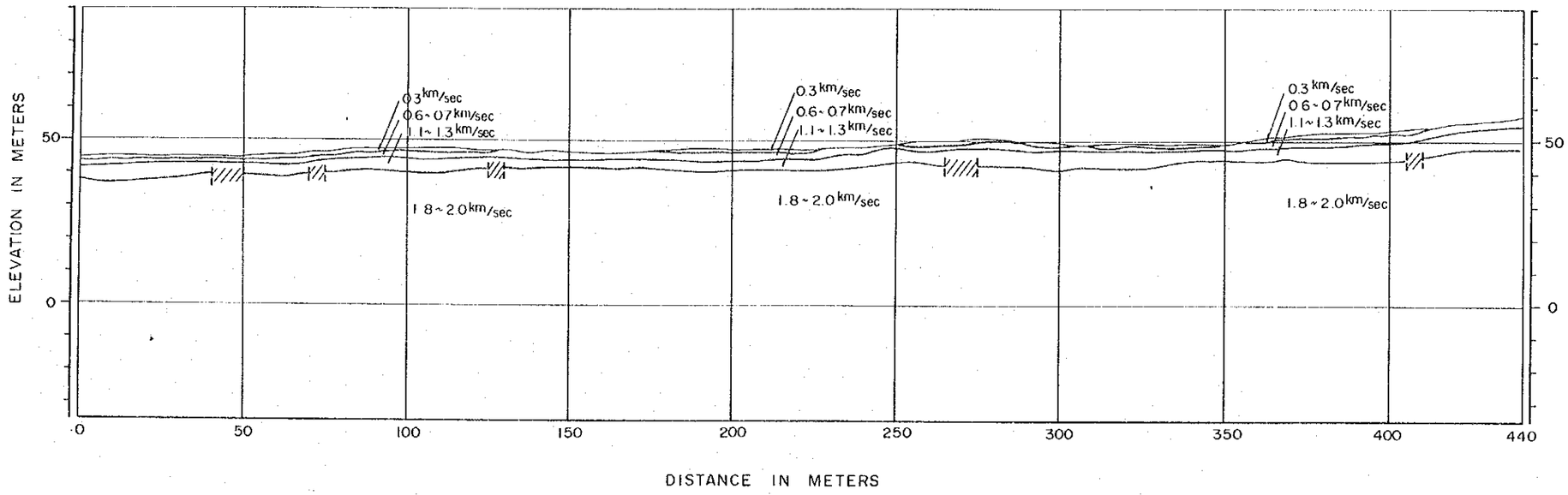
FEASIBILITY STUDY ON KARIAN
MULTIPURPOSE DAM CONSTRUCTION PROJECT

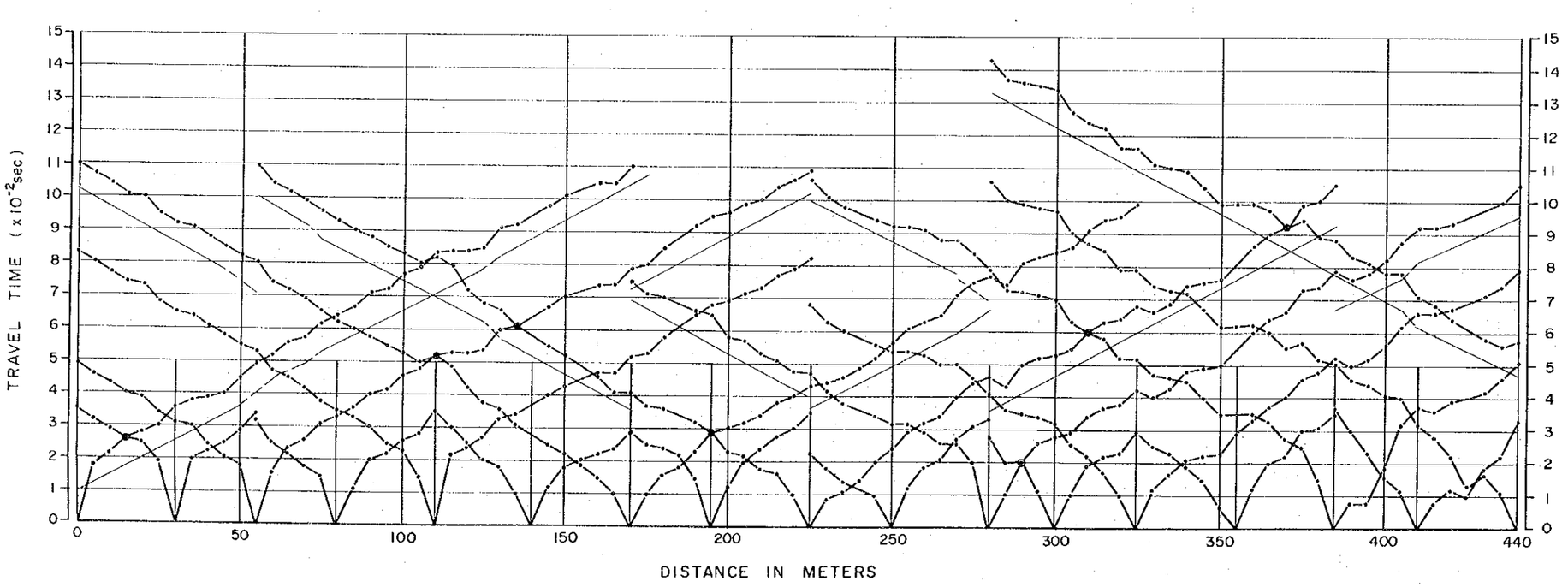
Geophysical Profile of
Guradog Quarry Site (Line A)

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-22

SAJIRA BORROW AREA-A LINE





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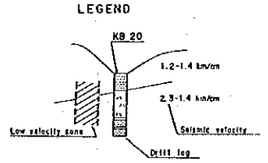

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Geophysical Profile of
Sajira Borrow Area (Line A)

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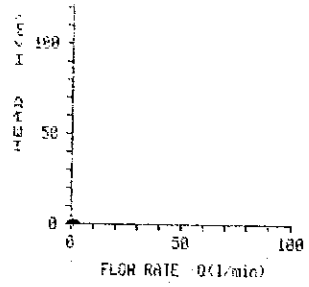
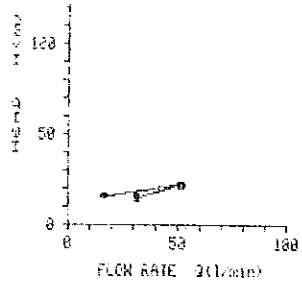
HOLE No : KB-17
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.5	1.5	38.4	3.8E-04



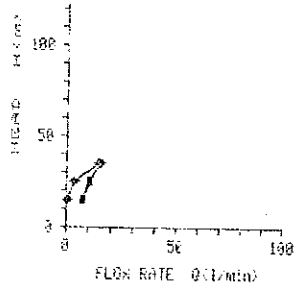
HOLE No : KB-17
DEPTH : 3 - 7 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.8	16.7	26.1	2.3E-04
2	22.4	51.9	58.8	7.2E-04
3	15.4	31.5	51.1	5.3E-04



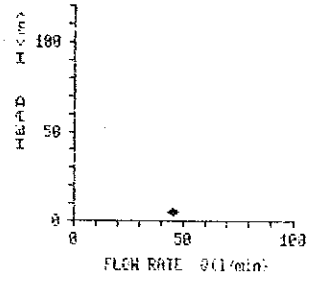
HOLE No : KB-17
DEPTH : 10.5 - 14.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.5	0.6	1.8E-05
2	35.4	3.7	3.7	4.5E-05
3	34.7	15.0	19.8	1.3E-04
4	24.3	18.7	18.7	1.3E-04
5	15.0	7.8	12.9	1.6E-04



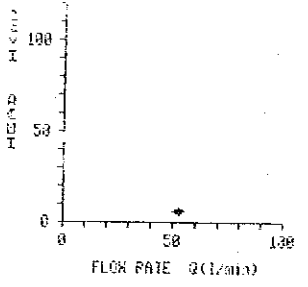
HOLE No : KB-17
DEPTH : 15.5 - 19 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.5	45.6	237.6	2.3E-03



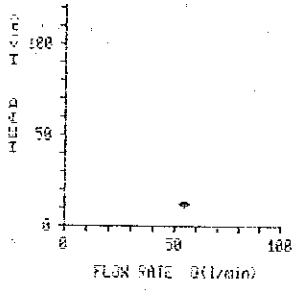
HOLE No : KB-17
DEPTH : 19 - 22 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.7	52.7	231.9	2.9E-03



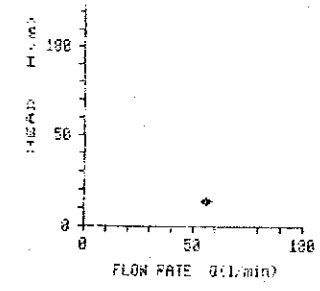
HOLE No : KB-17
DEPTH : 22 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.0	54.6	151.3	1.8E-03



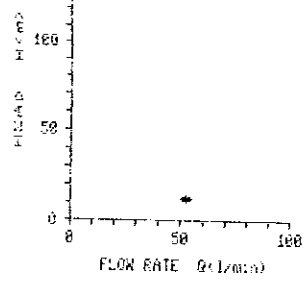
HOLE No : KB-17
DEPTH : 28.5 - 33 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.9	56.1	89.6	1.1E-03



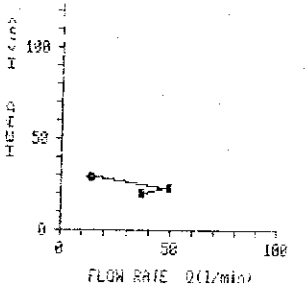
HOLE No : KB-17
DEPTH : 33 - 36 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.8	52.6	146.1	1.7E-03



HOLE No : KB-17
DEPTH : 36 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	28.6	14.3	12.5	1.5E-04
2	22.7	49.1	54.1	6.7E-04
3	28.5	36.5	44.6	5.5E-04



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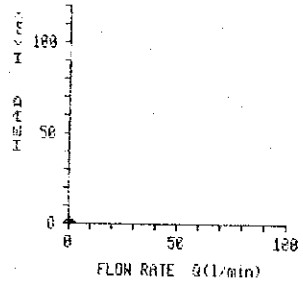
Water Pressure Test,KB-17 (1/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

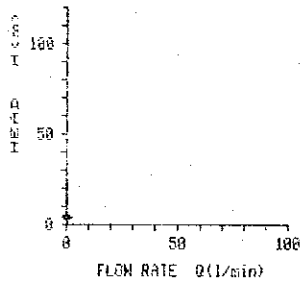
HOLE No : KB-18
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.5	8.6	14.8	1.6E-04



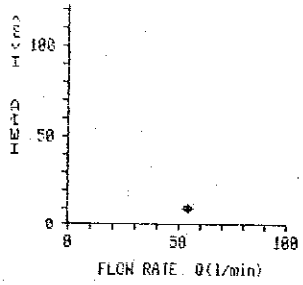
HOLE No : KB-18
DEPTH : 3 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.0	0.5	5.6	5.9E-05



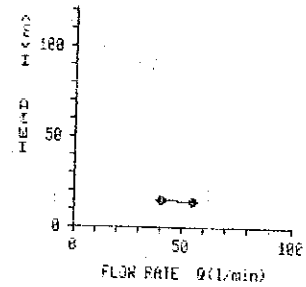
HOLE No : KB-18
DEPTH : 15 - 19.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	9.9	54.7	122.5	1.6E-03



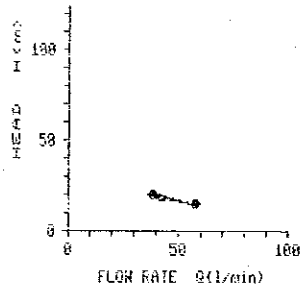
HOLE No : KB-18
DEPTH : 19.5 - 23.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.7	40.8	69.3	8.6E-04
2	14.3	55.2	96.3	1.2E-03
3	14.7	41.8	69.9	8.6E-04



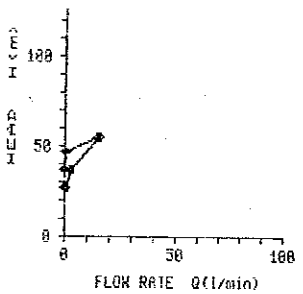
HOLE No : KB-18
DEPTH : 23.5 - 28 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	19.9	38.7	43.2	5.5E-04
2	15.3	57.7	83.9	1.1E-03
3	18.4	42.6	51.4	6.5E-04



HOLE No : KB-18
DEPTH : 34 - 37 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	26.9	0.1	0.1	1.6E-06
2	36.9	0.0	0.0	0.0E+00
3	46.9	0.7	0.5	5.4E-06
4	55.3	15.3	9.2	1.1E-04
5	36.8	3.8	2.7	3.1E-05
6	26.9	0.6	0.7	8.6E-06



HOLE No : KB-18
DEPTH : 37 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	28.0	1.9	2.3	2.6E-05
2	37.8	4.3	4.2	5.8E-05
3	94.9	20.6	7.2	3.4E-05
4	35.6	18.0	16.5	2.8E-04
5	27.6	7.1	3.6	9.9E-05

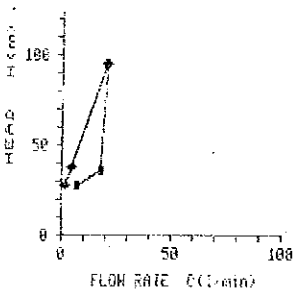


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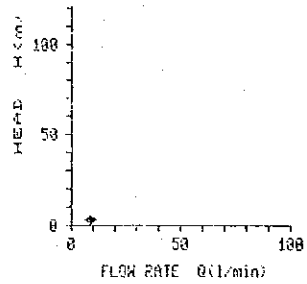
Fig.C-23

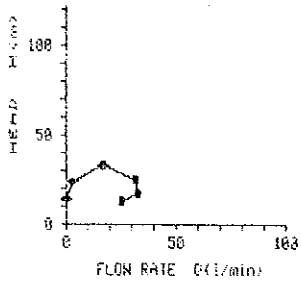
HOLE No : KB-19
DEPTH : 3 - 5.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.9	3.4	127.6	1.4E-03



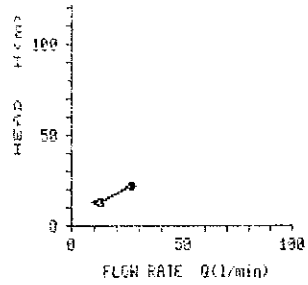
HOLE No : KB-19
DEPTH : 5.5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.7	0.0	0.0	0.0E+00
2	23.6	3.2	5.8	3.8E-05
3	33.3	17.0	11.3	1.4E-04
4	24.5	32.0	23.0	3.7E-04
5	17.5	33.0	42.0	5.3E-04
6	12.9	35.7	44.2	5.6E-04



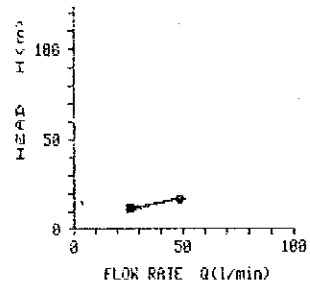
HOLE No : KB-19
DEPTH : 10 - 14 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.3	11.7	22.0	2.7E-04
2	22.1	25.0	30.3	3.7E-04
3	13.2	13.4	25.2	3.1E-04



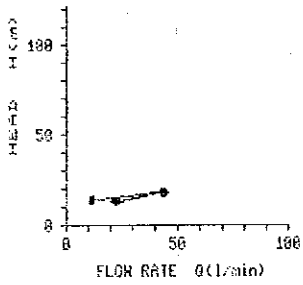
HOLE No : KB-19
DEPTH : 14 - 19 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.5	27.8	48.2	6.2E-04
2	17.1	48.5	55.7	7.3E-04
3	11.9	25.6	43.0	5.6E-04



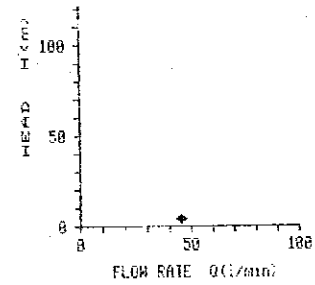
HOLE No : KB-19
DEPTH : 19 - 23.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.9	22.7	39.8	4.9E-04
2	17.6	43.7	55.2	7.0E-04
3	14.3	11.8	18.3	2.3E-04



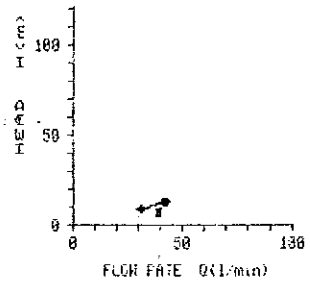
HOLE No : KB-19
DEPTH : 23.5 - 26.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.7	45.8	413.6	4.8E-03



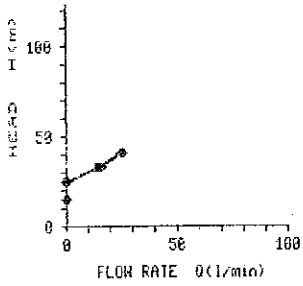
HOLE No : KB-19
DEPTH : 26.5 - 31 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	9.3	31.8	75.7	9.6E-04
2	13.2	42.3	71.2	9.8E-04
3	6.6	39.1	131.9	1.7E-03



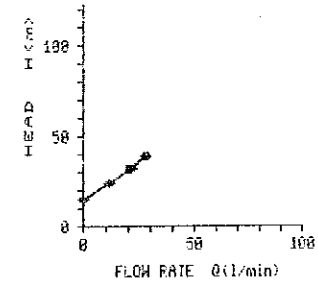
HOLE No : KB-19
DEPTH : 31 - 35.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.8	0.0	0.0	0.0E+00
2	24.8	0.0	0.0	0.0E+00
3	33.2	16.1	10.8	1.4E-04
4	40.8	25.5	13.9	1.8E-04
5	33.4	14.9	9.9	1.3E-04
6	24.8	0.0	0.0	0.0E+00
7	14.8	0.0	0.0	0.0E+00



HOLE No : KB-19
DEPTH : 35.5 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.0	0.0	0.0E+00
2	24.1	11.5	18.6	1.3E-04
3	31.6	21.9	15.4	1.9E-04
4	39.4	28.1	15.8	2.0E-04
5	32.2	28.2	14.8	1.8E-04



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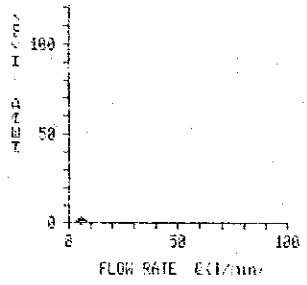
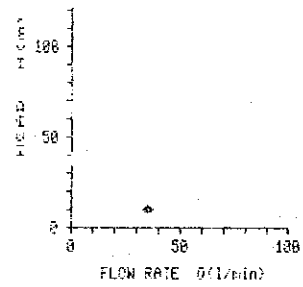
HOLE No : KB-20
DEPTH : 3 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	0.5	5.6	436.7	4.6E-03



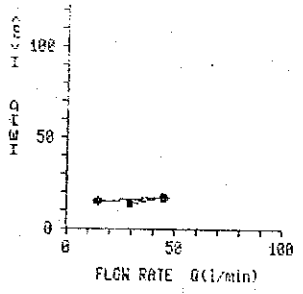
HOLE No : KB-20
DEPTH : 5 - 9.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	10.2	35.3	77.2	5.3E-04



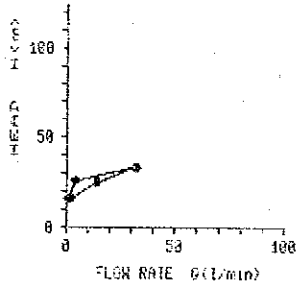
HOLE No : KB-20
DEPTH : 9.5 - 14 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.3	14.5	21.1	2.7E-04
2	15.7	45.4	68.3	7.6E-04
3	14.8	29.5	46.8	5.9E-04



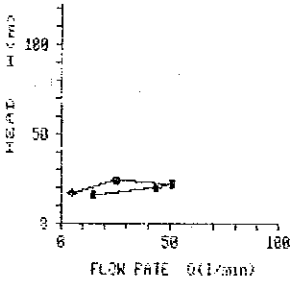
HOLE No : KB-20
DEPTH : 14 - 18.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.8	1.8	1.4	1.8E-05
2	36.9	4.0	3.4	4.3E-05
3	32.1	22.1	21.5	2.7E-04
4	25.4	14.5	12.6	1.6E-04
5	16.8	2.1	2.8	3.6E-05



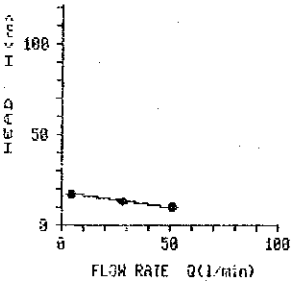
HOLE No : KB-20
DEPTH : 18.5 - 23 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.7	5.2	6.8	8.7E-05
2	24.4	25.6	23.3	2.9E-04
3	22.2	51.8	51.8	6.5E-04
4	19.7	43.8	49.3	6.2E-04
5	16.8	15.2	21.1	2.7E-04



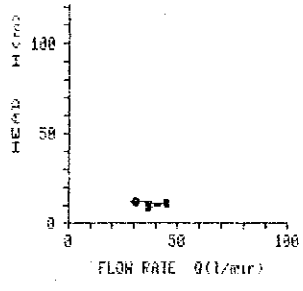
HOLE No : KB-20
DEPTH : 23 - 27.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.7	4.6	6.1	7.7E-05
2	9.8	51.2	115.9	1.5E-03
3	13.1	28.7	48.9	6.2E-04



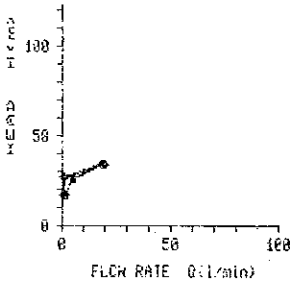
HOLE No : KB-20
DEPTH : 27.5 - 32 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.6	31.1	59.8	7.6E-04
2	10.7	45.0	93.1	1.2E-03
3	9.4	36.9	86.7	1.1E-03



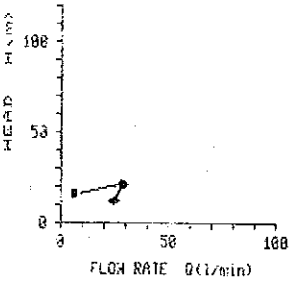
HOLE No : KB-20
DEPTH : 32 - 35 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.6	1.0	2.0	2.3E-05
2	26.6	1.4	1.9	2.0E-05
3	34.3	19.3	18.6	2.2E-04
4	26.5	5.2	8.5	7.6E-05
5	16.5	1.8	3.5	4.1E-05



HOLE No : KB-20
DEPTH : 35 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.5	24.6	39.5	5.1E-04
2	21.0	28.6	27.3	3.5E-04
3	16.4	6.2	7.5	9.8E-05



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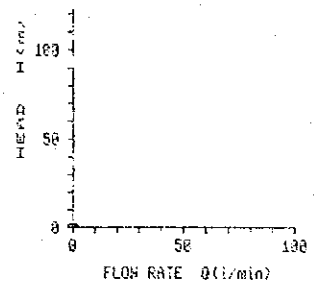
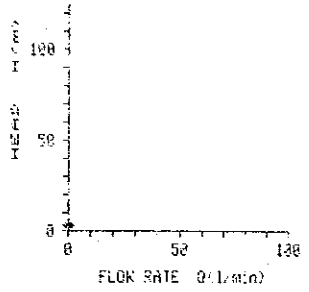
HOLE No : KB-21
DEPTH : 0 - 1.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	0.8	0.2	17.8	1.7E-04



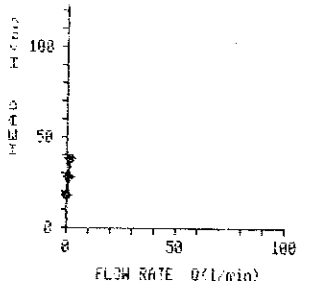
HOLE No : KB-21
DEPTH : 1.5 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.2	3.0	4.8	4.7E-05



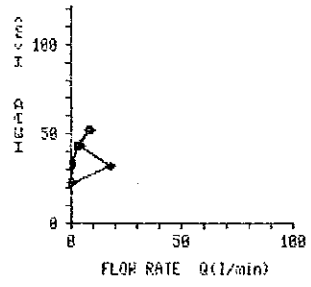
HOLE No : KB-21
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	18.2	3.3	8.3	4.3E-05
2	28.3	1.3	8.9	1.1E-05
3	33.2	1.7	8.9	1.3E-05
4	28.2	0.9	8.6	8.3E-06
5	18.2	0.2	8.2	2.1E-06



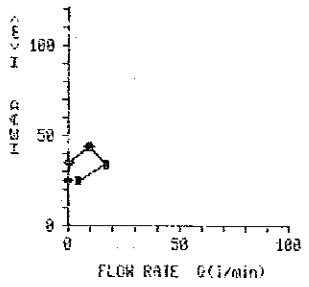
HOLE No : KB-21
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	28.6	0.9	8.8	1.0E-05
2	31.9	18.4	11.5	1.5E-04
3	42.6	4.3	2.9	2.6E-05
4	52.4	8.8	3.3	4.3E-05
5	42.6	2.5	1.2	1.5E-05
6	32.6	0.9	0.5	6.8E-06
7	22.6	0.0	0.0	0.0E+00



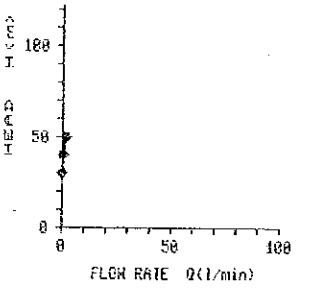
HOLE No : KB-21
DEPTH : 17 - 21.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	24.6	0.3	0.2	2.5E-06
2	34.6	0.9	0.5	6.9E-06
3	44.2	9.9	5.0	9.3E-05
4	33.6	17.4	11.5	1.5E-04
5	24.6	4.3	4.4	5.5E-05



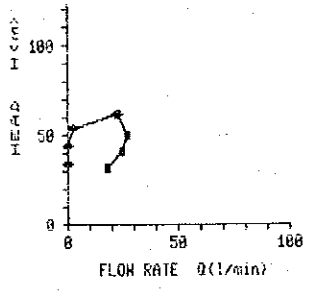
HOLE No : KB-21
DEPTH : 21.5 - 26 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	29.6	0.1	0.0	4.7E-07
2	39.6	0.6	0.3	4.3E-06
3	49.6	1.6	0.7	9.1E-06
4	39.6	0.4	0.2	2.5E-06
5	29.7	0.0	0.0	0.0E+00



HOLE No : KB-21
DEPTH : 26 - 30.5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	34.2	0.0	0.0	0.0E+00
2	44.2	0.1	0.1	6.4E-07
3	54.1	2.0	1.1	1.5E-05
4	61.5	22.5	8.1	1.0E-04
5	58.4	27.0	11.9	1.5E-04
6	41.1	24.5	13.3	1.7E-04
7	32.5	18.2	12.5	1.6E-04



HOLE No : KB-21
DEPTH : 30.5 - 35 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	37.6	0.0	0.0	0.0E+00
2	47.6	0.8	0.4	4.7E-06
3	57.3	7.1	2.8	3.5E-05
4	47.6	0.0	0.0	1.5E-07
5	37.6	0.0	0.0	0.0E+00

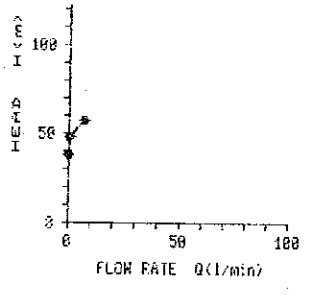


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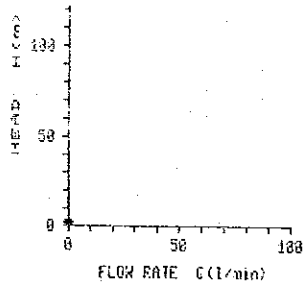
Fig.C-23

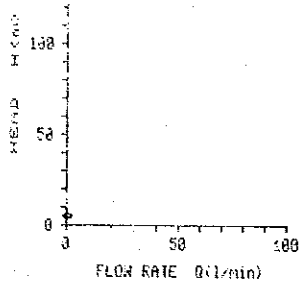
HOLE No : KB-22
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.9	0.0	0.7	3.1E-06



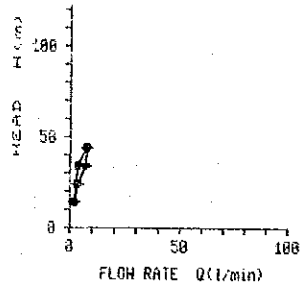
HOLE No : KB-22
DEPTH : 3 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.6	1.0	16.7	1.1E-04



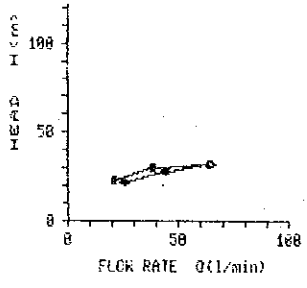
HOLE No : KB-22
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.1	2.5	3.5	4.5E-05
2	24.1	3.6	3.1	4.0E-05
3	34.1	7.2	4.2	5.4E-05
4	44.1	7.5	3.4	4.4E-05
5	34.1	3.5	2.1	2.7E-05
6	24.1	3.2	2.7	3.4E-05
7	14.1	2.4	3.4	4.4E-05



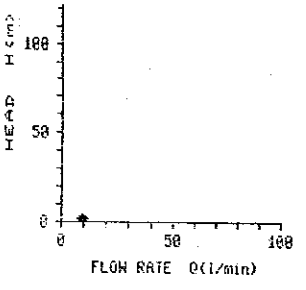
HOLE No : KB-22
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	22.3	26.2	23.5	3.0E-04
2	28.4	44.5	31.3	4.1E-04
3	31.8	64.8	40.8	5.3E-04
4	29.9	38.7	25.9	3.4E-04
5	23.0	21.0	18.2	2.4E-04



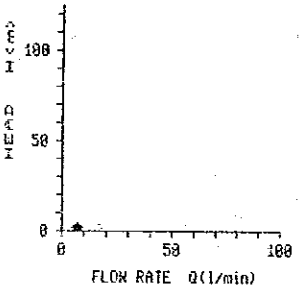
HOLE No : KB-23
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.8	16.6	181.8	2.1E-03



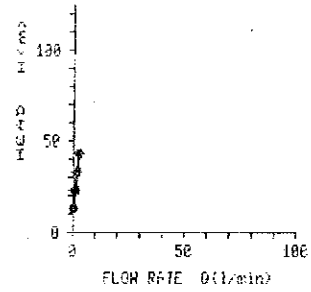
HOLE No : KB-23
DEPTH : 3 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.9	7.3	194.3	2.0E-03



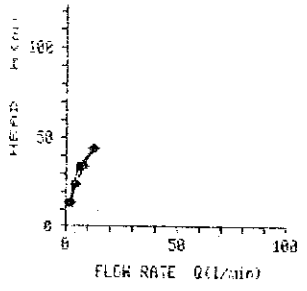
HOLE No : KB-23
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.9	0.0	0.0	3.3E+00
2	22.9	0.7	0.6	8.2E-05
3	32.9	1.7	1.0	1.4E-05
4	42.9	2.6	1.2	1.6E-05
5	32.9	2.4	1.5	1.9E-05
6	22.9	1.6	1.4	1.8E-05
7	12.9	0.0	0.0	0.2E+00



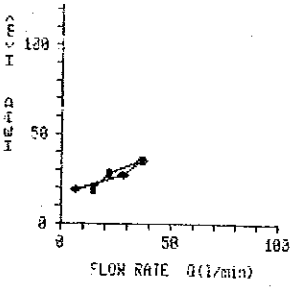
HOLE No : KB-23
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.1	2.3	3.2	4.1E-05
2	24.1	4.9	4.1	5.3E-05
3	34.0	8.1	4.7	6.1E-05
4	43.8	12.6	5.7	7.4E-05
5	34.0	6.2	3.6	4.7E-05
6	24.1	3.7	2.0	3.3E-05
7	14.1	2.4	3.3	4.3E-05



HOLE No : KB-23
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	19.4	6.5	6.7	8.7E-05
2	27.2	28.8	28.6	2.7E-04
3	35.5	36.5	28.7	2.7E-04
4	28.2	21.5	15.3	2.0E-04
5	18.9	14.8	15.7	2.0E-04



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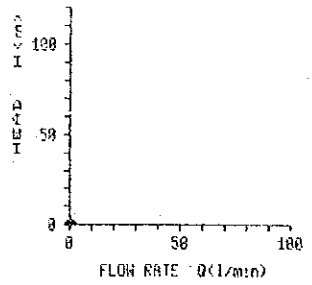
Water Pressure Test,KB-22,KB-23 (6/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

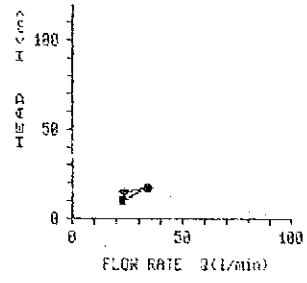
HOLE No : CB-1
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.5	8.7	14.7	1.7E-04



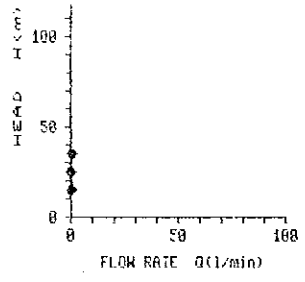
HOLE No : CB-1
DEPTH : 3.5 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.7	23.5	63.8	7.1E-04
2	16.8	34.8	88.9	9.1E-04
3	9.8	22.7	92.8	1.0E-03



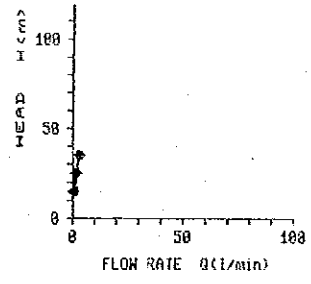
HOLE No : CB-1
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.6	1.2	1.4E-05
2	25.1	0.3	0.4	5.0E-06
3	35.1	1.0	0.9	1.1E-05
4	25.1	0.4	0.5	6.1E-06
5	15.1	0.0	0.0	0.0E+00



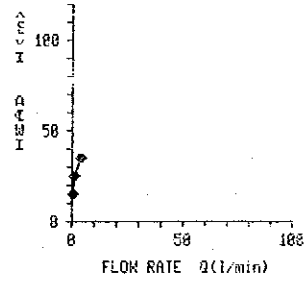
HOLE No : CB-1
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.4	0.9	1.1E-05
2	25.1	1.5	2.0	2.4E-05
3	35.1	3.3	3.2	3.7E-05
4	25.1	1.7	2.3	2.7E-05
5	15.1	1.1	2.3	2.7E-05



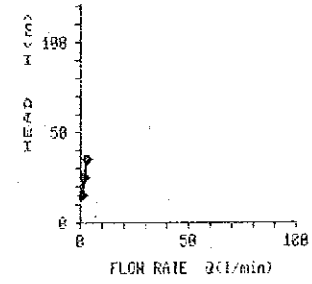
HOLE No : CB-1
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	1.0	2.2	2.6E-05
2	25.1	1.3	1.7	2.0E-05
3	35.1	4.9	3.8	4.5E-05
4	25.1	1.4	1.9	2.2E-05
5	15.1	0.6	1.3	1.5E-05



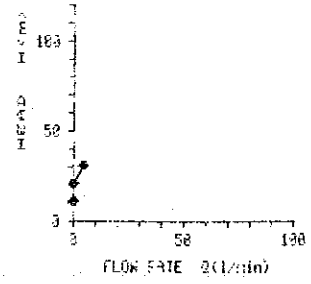
HOLE No : CB-1
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	1.3	2.9	3.4E-05
2	25.1	2.6	2.7	3.1E-05
3	35.1	3.1	3.0	3.5E-05
4	25.1	1.7	2.3	2.7E-05
5	15.1	1.0	2.2	2.6E-05



HOLE No : CB-1
DEPTH : 18 - 22 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.1	0.1	0.3	3.4E-06
2	21.1	0.2	0.4	4.3E-06
3	31.0	4.5	7.5	8.6E-05
4	21.1	0.4	0.7	8.2E-06
5	11.1	0.0	0.0	0.0E+00



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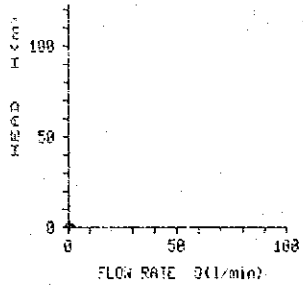
Water Pressure Test,CB-1 (7/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

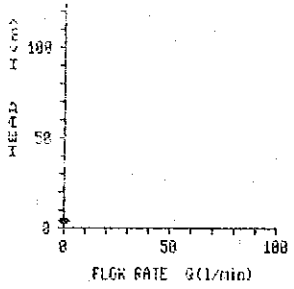
HOLE No : CB-2
DEPTH : 0 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.5	0.9	19.2	2.2E-04



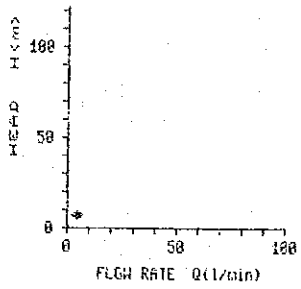
HOLE No : CB-2
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.5	0.5	3.4	4.6E-05



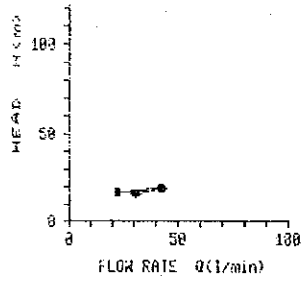
HOLE No : CB-2
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.7	4.7	23.4	2.7E-04



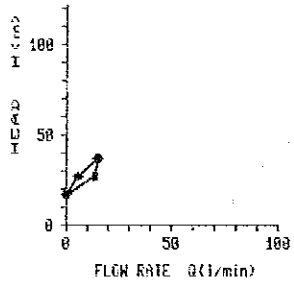
HOLE No : CB-2
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.7	31.0	65.7	7.7E-04
2	19.2	42.6	74.0	8.7E-04
3	16.5	32.6	45.6	5.9E-04



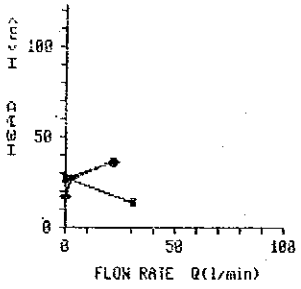
HOLE No : CB-2
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	17.1	0.0	0.0	0.0E+00
2	27.0	5.6	6.9	8.1E-05
3	36.6	15.0	13.7	1.6E-04
4	28.6	13.7	17.1	2.0E-04
5	17.1	0.4	0.8	9.8E-06



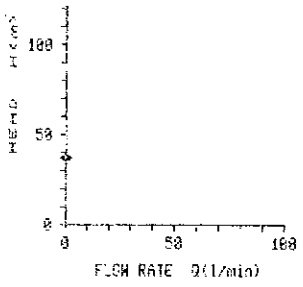
HOLE No : CB-2
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	17.1	0.0	0.0	0.0E+00
2	27.1	2.7	3.3	3.9E-05
3	35.6	22.8	28.6	2.4E-04
4	27.1	0.0	0.0	0.0E+00
5	14.2	31.1	73.0	8.5E-04



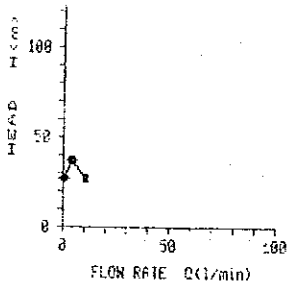
HOLE No : CB-2
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	37.1	0.2	0.2	2.2E-06



HOLE No : CB-2
DEPTH : 21 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	27.2	0.8	0.7	8.9E-06
2	37.2	4.0	2.7	3.4E-05
3	26.3	10.5	9.8	1.2E-04



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Water Pressure Test,CB-2 (8/24)

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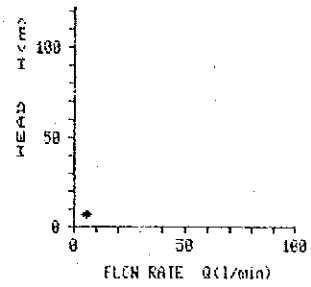
Fig.C-23

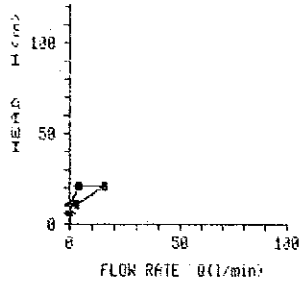
HOLE No : CB-3
DEPTH : 4 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.5	5.8	44.3	4.7E-04



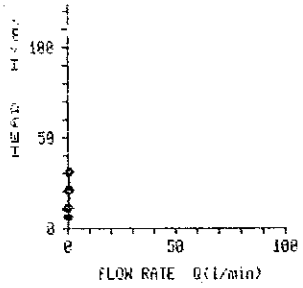
HOLE No : CB-3
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.2	0.1	0.3	3.5E-06
2	11.2	0.7	2.0	2.4E-05
3	21.2	4.0	8.3	7.4E-05
4	28.9	15.8	25.2	2.9E-04
5	11.2	3.3	9.8	1.1E-04



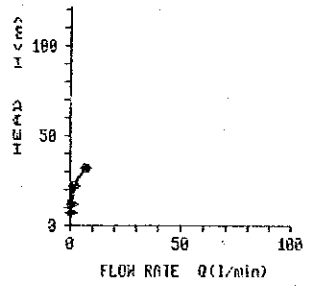
HOLE No : CB-3
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.3	0.3	1.3	1.5E-05
2	11.3	0.2	0.5	5.7E-06
3	21.3	0.8	1.3	1.5E-05
4	31.3	0.6	0.6	7.1E-06
5	21.3	0.9	1.3	1.6E-05
6	11.3	0.4	1.2	1.4E-05



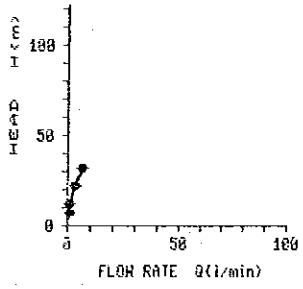
HOLE No : CB-3
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	7.1	0.7	3.1	3.7E-05
2	12.1	1.1	2.9	3.4E-05
3	22.1	2.4	3.6	4.2E-05
4	32.0	7.2	7.5	8.8E-05
5	22.1	1.3	2.0	2.3E-05
6	12.1	0.1	0.3	3.4E-06



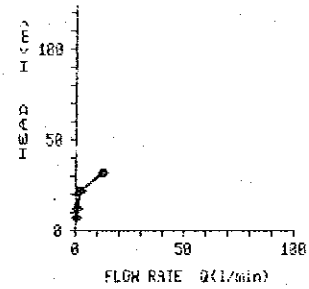
HOLE No : CB-3
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.9	1.8	3.7	4.6E-05
2	11.9	1.5	3.1	3.9E-05
3	21.9	3.7	4.2	5.2E-05
4	31.8	6.9	5.4	6.7E-05
5	21.9	3.2	3.6	4.5E-05
6	11.9	1.1	2.2	2.8E-05



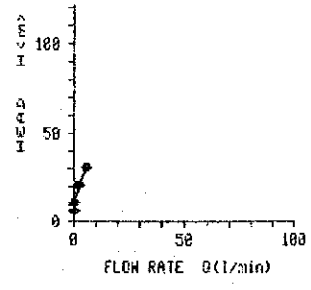
HOLE No : CB-3
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	7.3	0.6	4.8	4.2E-05
2	12.3	1.5	5.9	6.3E-05
3	22.3	3.8	6.7	7.1E-05
4	31.7	12.8	20.2	2.1E-04
5	22.3	1.6	3.5	3.7E-05
6	12.3	0.8	3.3	3.5E-05



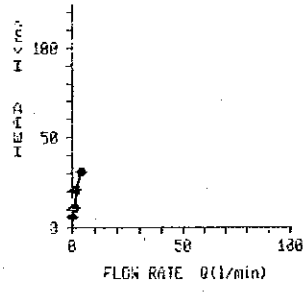
HOLE No : CB-3
DEPTH : 21 - 24 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.1	0.2	1.1	1.3E-05
2	11.1	0.3	2.4	2.8E-05
3	21.1	2.6	4.1	4.8E-05
4	31.0	5.6	6.8	7.0E-05
5	21.1	2.5	3.9	4.6E-05
6	11.1	0.2	0.6	7.2E-06



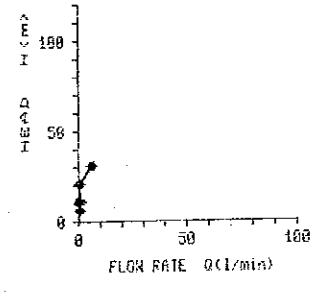
HOLE No : CB-3
DEPTH : 24 - 27 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.1	0.3	1.7	2.0E-05
2	11.1	1.2	3.6	4.2E-05
3	21.1	1.6	2.5	2.9E-05
4	31.1	4.3	4.6	5.4E-05
5	21.1	2.3	3.6	4.2E-05
6	11.1	1.2	3.5	4.1E-05



HOLE No : CB-3
DEPTH : 27 - 30 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.3	0.5	2.6	3.1E-05
2	11.3	1.1	3.1	3.6E-05
3	21.3	0.8	1.3	1.5E-05
4	31.1	6.5	6.9	8.1E-05
5	21.3	0.7	1.1	1.3E-05
6	11.3	0.2	0.7	9.3E-06



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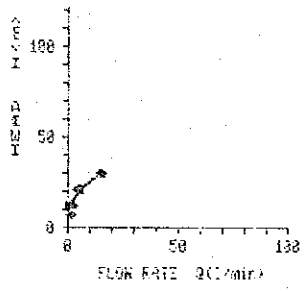
Water Pressure Test,CB-3 (9/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

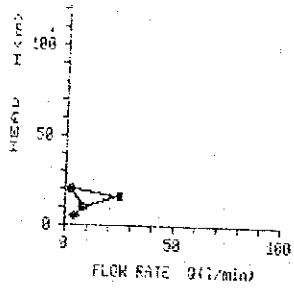
HOLE No : CB-3
DEPTH : 30 - 33 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.5	1.5	7.8	9.2E-05
2	11.5	2.3	6.5	7.5E-05
3	21.4	4.9	7.6	8.3E-05
4	36.1	15.7	17.4	3.2E-04
5	21.3	6.8	9.4	1.1E-04
6	11.5	0.4	1.2	1.4E-05



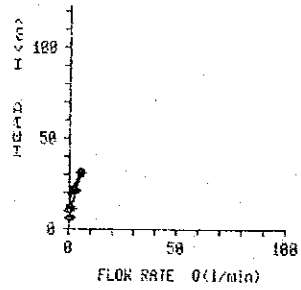
HOLE No : CB-3
DEPTH : 33 - 36 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.4	4.2	25.6	3.0E-04
2	12.0	5.0	28.7	3.4E-04
3	20.4	3.0	4.8	5.6E-05
4	16.2	25.4	52.1	6.1E-04
5	18.1	7.7	25.3	3.0E-04



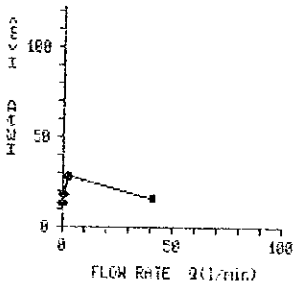
HOLE No : CB-3
DEPTH : 36 - 43 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.1	0.6	2.6	3.2E-05
2	11.1	1.3	2.9	3.6E-05
3	21.1	3.2	3.8	4.8E-05
4	38.9	6.0	4.3	6.0E-05
5	21.1	1.1	1.3	1.6E-05
6	11.1	0.3	0.7	8.1E-06



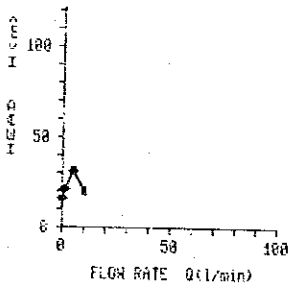
HOLE No : CB-4
DEPTH : 5.5 - 8 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.8	0.4	1.2	1.3E-05
2	17.8	0.7	1.5	1.7E-05
3	27.8	2.5	3.6	4.0E-05
4	15.9	41.3	103.9	1.2E-03



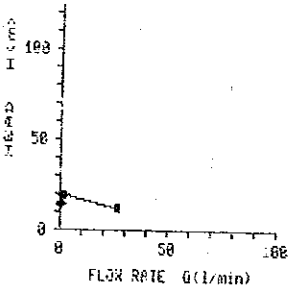
HOLE No : CB-4
DEPTH : 8 - 11 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.6	0.3	0.6	6.6E-06
2	20.6	1.5	2.4	2.8E-05
3	30.6	5.1	5.6	6.5E-05
4	20.5	16.3	16.8	2.0E-04



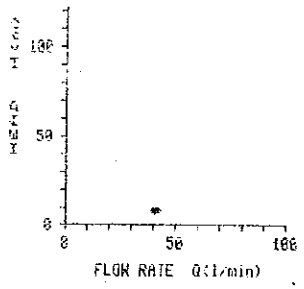
HOLE No : CB-4
DEPTH : 11 - 14 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.9	0.6	1.9	2.2E-05
2	18.9	1.8	3.1	3.6E-05
3	12.4	26.6	71.5	8.4E-04



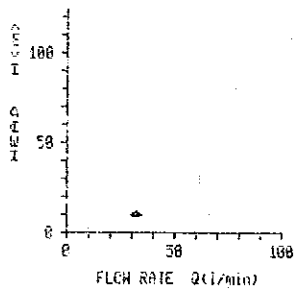
HOLE No : CB-4
DEPTH : 14 - 17 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	8.3	41.8	164.4	1.9E-03



HOLE No : CB-4
DEPTH : 17 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	10.1	32.3	107.1	1.3E-03



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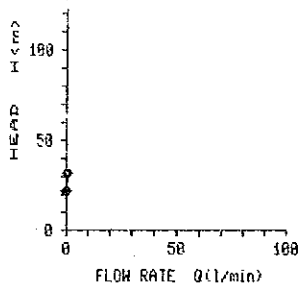
Water Pressure Test,CB-4 (10/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

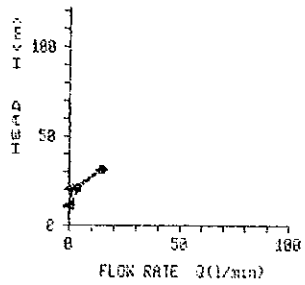
HOLE No : CB-5
DEPTH : 1.5 - 3 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	21.5	0.1	0.2	1.8E-06
2	21.5	0.7	1.4	1.4E-05
3	21.5	8.2	8.5	5.3E-06



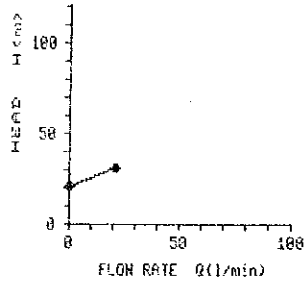
HOLE No : CB-5
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	10.9	0.1	0.4	4.6E-06
2	20.9	1.5	2.4	2.8E-05
3	30.6	14.8	16.0	1.9E-04
4	20.9	4.1	6.5	7.6E-05
5	10.9	1.4	4.1	4.8E-05



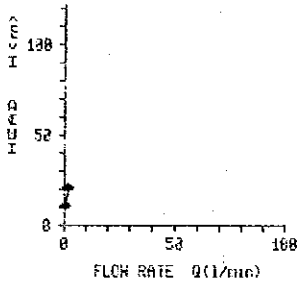
HOLE No : CB-5
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	21.1	0.7	1.1	1.3E-05
2	30.6	21.1	23.8	2.7E-04
3	21.1	8.1	8.1	9.2E-07



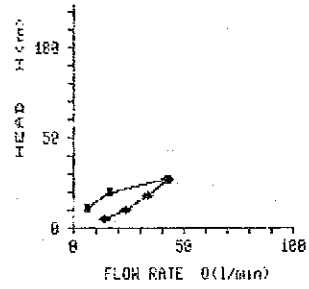
HOLE No : CB-5
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.8	0.8	2.3	2.7E-05
2	21.8	2.2	3.5	4.1E-05
3	21.8	1.7	2.8	2.2E-05



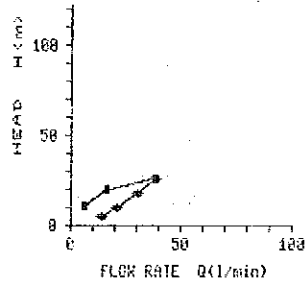
HOLE No : CB-5
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.5	14.2	86.3	1.0E-03
2	9.6	23.9	83.1	9.7E-04
3	18.2	33.6	61.4	7.2E-04
4	26.6	42.5	53.2	6.2E-04
5	28.3	16.9	27.8	3.3E-04
6	18.9	6.1	19.7	2.2E-04



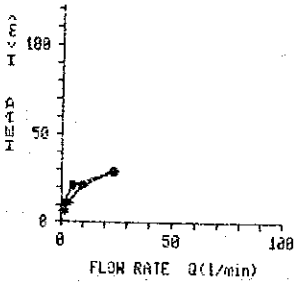
HOLE No : CB-5
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.3	14.4	98.4	1.1E-03
2	9.6	21.1	73.2	8.5E-04
3	18.1	31.8	57.1	6.7E-04
4	26.5	38.7	48.8	5.7E-04
5	28.1	16.9	28.8	3.3E-04
6	18.8	6.3	19.2	2.2E-04



HOLE No : CB-5
DEPTH : 18 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.9	1.5	12.6	1.3E-04
2	10.9	3.5	15.8	1.7E-04
3	20.6	9.7	23.5	2.5E-04
4	20.9	24.1	41.8	4.4E-04
5	20.9	5.2	12.5	1.3E-04
6	10.9	1.6	7.4	7.8E-05



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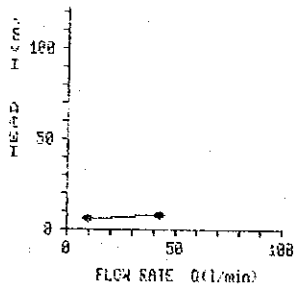
Water Pressure Test,CB-5 (11/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

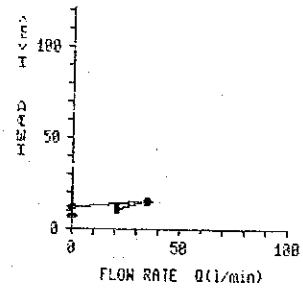
HOLE No : CB-6
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.8	9.8	54.2	6.3E-04
2	8.8	42.6	177.3	2.1E-03



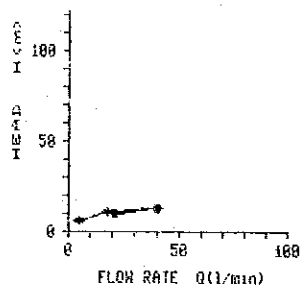
HOLE No : CB-6
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.9	0.0	0.0	0.0E+00
2	11.9	0.0	0.0	0.0E+00
3	15.4	35.2	75.1	8.9E-04
4	11.4	21.2	62.8	7.3E-04



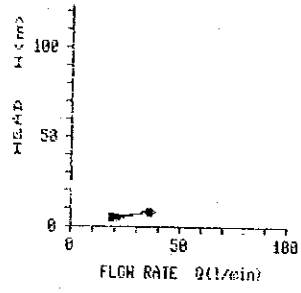
HOLE No : CB-6
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.2	5.1	27.6	3.2E-04
2	10.6	19.1	56.9	6.7E-04
3	13.2	40.1	108.4	1.2E-03
4	10.4	21.2	67.9	7.9E-04



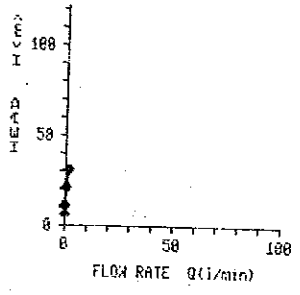
HOLE No : CB-6
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.2	21.3	137.6	1.6E-03
2	8.1	36.1	148.2	1.7E-03
3	5.4	18.6	114.4	1.3E-03



HOLE No : CB-6
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.1	0.8	8.2	2.2E-06
2	11.1	0.3	0.9	10.8E-06
3	21.1	0.8	1.2	1.5E-05
4	31.1	1.9	2.0	2.3E-05
5	21.1	0.7	1.2	1.4E-05
6	11.1	0.1	0.4	4.9E-06



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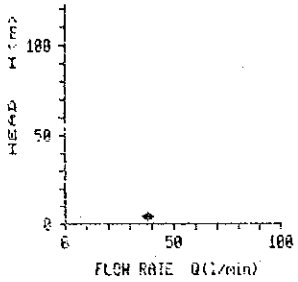
Water Pressure Test,CB-6 (12/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

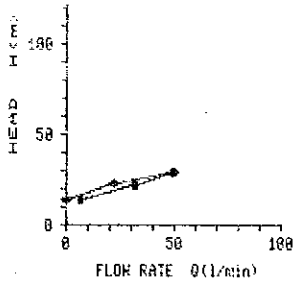
HOLE No : CB-7
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.2	38.3	306.2	2.6E-03



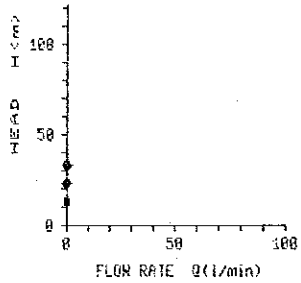
HOLE No : CB-7
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.8	0.1	0.1	1.7E-06
2	22.9	22.2	32.2	3.8E-04
3	39.4	49.5	56.1	6.6E-04
4	22.8	31.8	48.2	5.6E-04
5	13.7	6.3	16.6	1.9E-04



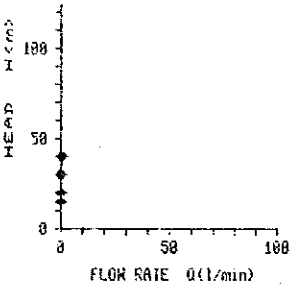
HOLE No : CB-7
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	23.3	0.1	0.1	8.3E-07
2	33.3	2.4	0.4	4.4E-06
3	23.3	0.4	0.5	5.3E-06
4	13.3	0.2	0.6	7.2E-06



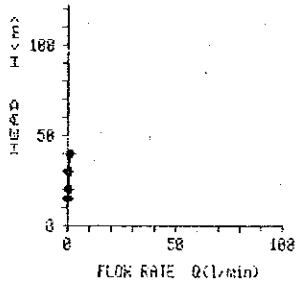
HOLE No : CB-7
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.2	0.4	5.2E-06
2	28.1	0.2	0.3	3.7E-06
3	38.1	0.3	0.4	4.5E-06
4	48.1	0.7	0.6	6.7E-06
5	38.1	0.2	0.2	2.3E-06



HOLE No : CB-7
DEPTH : 21 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	0.2	0.3	3.3E-06
2	28.1	0.2	0.3	3.8E-06
3	38.1	0.2	0.2	2.8E-06
4	48.1	1.4	0.8	1.0E-05
5	38.1	0.9	0.7	9.0E-06
6	28.1	0.6	0.7	8.6E-06



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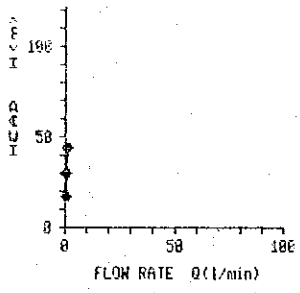
Water Pressure Test,CB-7 (13/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

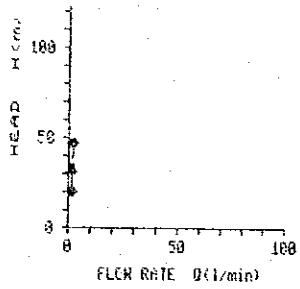
HOLE No : TB-1
DEPTH : 2 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	17.0	0.9	1.3	2.1E-05
2	30.0	0.9	1.0	1.2E-05
3	44.0	1.3	1.0	1.2E-05
4	58.0	0.6	0.7	7.8E-06
5	17.0	0.6	1.2	1.4E-05



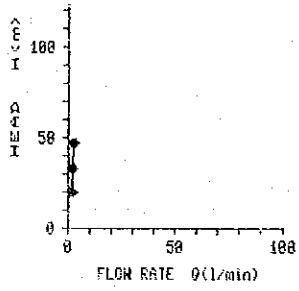
HOLE No : TB-1
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	19.7	1.9	1.9	2.5E-05
2	30.7	1.9	1.2	1.6E-05
3	46.7	2.1	0.9	1.2E-05
4	32.7	1.3	1.1	1.4E-05
5	19.7	1.8	1.5	2.4E-05



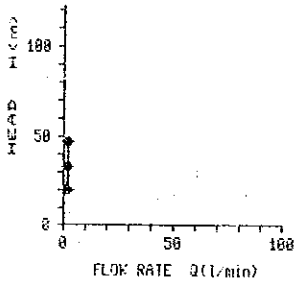
HOLE No : TB-1
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	19.6	2.0	2.0	2.6E-05
2	32.8	2.2	1.3	1.8E-05
3	46.8	2.6	1.1	1.5E-05
4	32.8	2.2	1.3	1.8E-05
5	19.8	1.9	1.9	2.5E-05



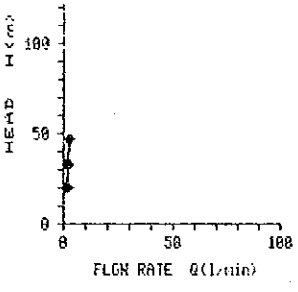
HOLE No : TB-1
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	28.1	2.2	2.2	2.9E-05
2	33.1	2.1	1.3	1.7E-05
3	47.1	2.4	1.0	1.3E-05
4	33.1	2.0	1.2	1.6E-05
5	28.1	1.9	1.9	2.5E-05



HOLE No : TB-1
DEPTH : 20 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	28.2	2.0	2.0	2.6E-05
2	33.2	2.2	1.3	1.7E-05
3	47.2	2.7	1.1	1.5E-05
4	33.2	2.0	1.2	1.6E-05
5	28.2	1.9	1.9	2.5E-05



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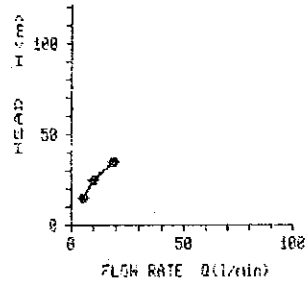
FEASIBILITY STUDY ON KARIAN
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Water Pressure Test,TB-1 (14/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

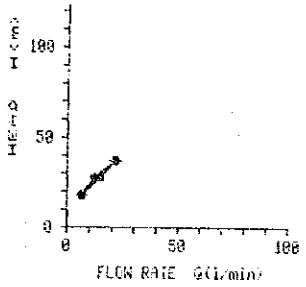
HOLE No : TB-2
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.1	5.7	12.6	1.5E-04
2	25.1	10.3	13.7	1.6E-04
3	34.9	19.8	16.1	2.1E-04
4	25.1	10.5	14.3	1.6E-04
5	15.1	5.8	12.8	1.5E-04



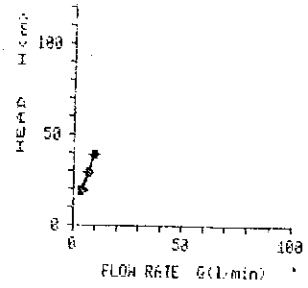
HOLE No : TB-2
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	18.3	6.6	12.2	1.4E-04
2	27.8	12.9	15.5	1.6E-04
3	37.5	21.9	19.5	2.3E-04
4	27.7	15.3	18.4	2.1E-04
5	18.0	6.8	12.6	1.5E-04



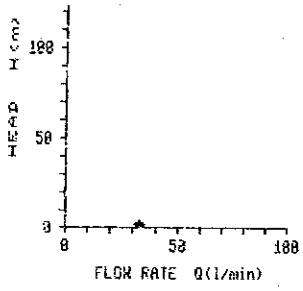
HOLE No : TB-2
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	18.8	4.8	8.5	10.0E-05
2	28.7	7.2	8.4	9.9E-05
3	38.6	9.6	8.3	9.7E-05
4	28.7	7.0	8.1	9.5E-05
5	18.8	3.3	5.9	6.9E-05



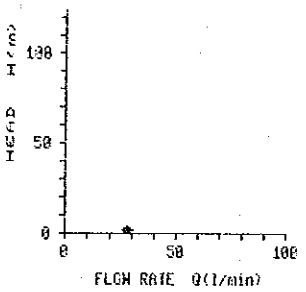
HOLE No : TB-2
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.7	33.0	647.8	7.6E-03



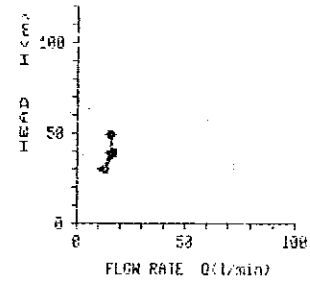
HOLE No : TB-2
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.9	28.4	496.9	5.8E-03



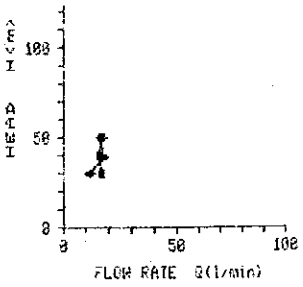
HOLE No : TB-2
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	29.6	12.3	13.8	1.6E-04
2	39.3	15.3	13.4	1.6E-04
3	49.2	15.9	18.8	1.3E-04
4	39.1	17.0	14.5	1.7E-04
5	29.5	13.0	14.7	1.7E-04



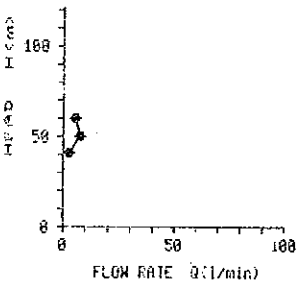
HOLE No : TB-2
DEPTH : 21 - 23 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	38.1	12.0	19.9	2.1E-04
2	39.4	17.6	22.3	2.4E-04
3	49.5	17.6	17.2	1.8E-04
4	39.7	16.1	20.3	2.2E-04
5	29.5	17.2	29.1	3.1E-04



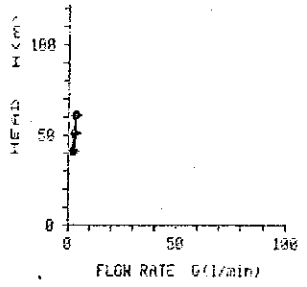
HOLE No : TB-2
DEPTH : 23 - 27 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	48.6	2.9	1.8	2.2E-05
2	58.3	7.2	3.9	4.8E-05
3	68.5	5.6	2.3	2.9E-05
4	58.3	7.9	3.9	4.3E-05
5	48.6	3.5	1.6	2.0E-05



HOLE No : TB-2
DEPTH : 27 - 30 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	48.7	2.6	2.1	2.5E-05
2	58.7	3.7	2.4	2.9E-05
3	68.7	3.8	2.1	2.4E-05
4	58.7	2.7	1.9	2.1E-05
5	48.7	2.0	1.6	1.9E-05



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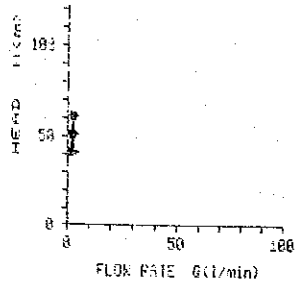
Water Pressure Test,TB-2 (15/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-23

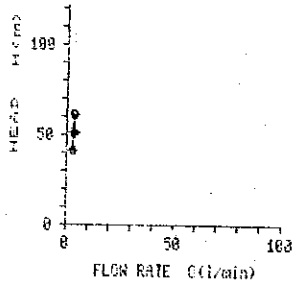
HOLE No : TB-2
DEPTH : 30 - 33 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	48.7	2.7	2.2	2.6E-05
2	50.7	2.3	1.8	2.2E-05
3	60.7	2.9	1.6	1.9E-05
4	50.7	2.1	1.4	1.6E-05
5	48.7	1.9	1.6	1.8E-05



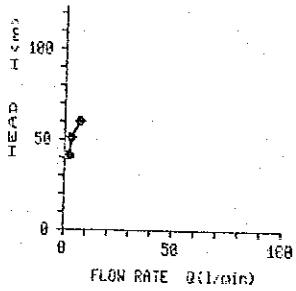
HOLE No : TB-2
DEPTH : 33 - 36 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	48.7	2.3	2.3	2.7E-05
2	50.7	3.7	2.4	2.8E-05
3	60.7	3.8	2.1	2.4E-05
4	50.7	3.2	2.1	2.5E-05
5	48.7	3.0	2.5	2.9E-05



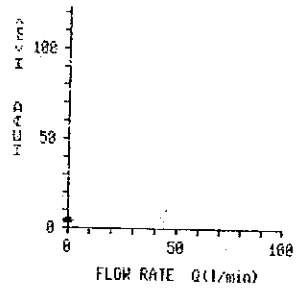
HOLE No : TB-2
DEPTH : 36 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	40.7	2.9	1.8	3.2E-05
2	50.7	3.2	1.6	2.8E-05
3	60.4	7.0	2.9	3.6E-05
4	50.7	3.2	1.6	2.8E-05
5	40.7	2.3	1.4	1.8E-05



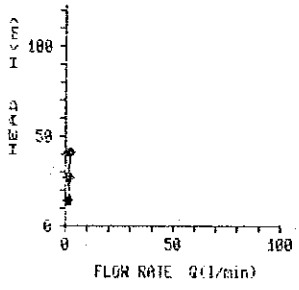
HOLE No : TB-3
DEPTH : 2 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.7	0.2	2.1	3.4E-05



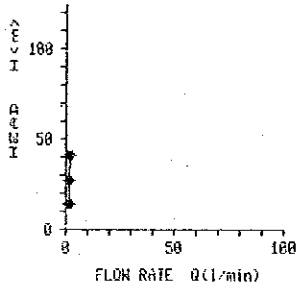
HOLE No : TB-3
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.5	1.7	2.3	3.1E-05
2	27.5	1.9	1.4	1.8E-05
3	41.5	2.4	1.2	1.5E-05
4	27.5	1.8	1.3	1.7E-05
5	14.5	1.6	2.2	2.9E-05



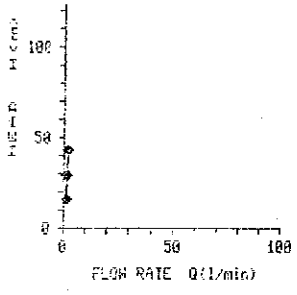
HOLE No : TB-3
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.4	1.6	2.2	2.9E-05
2	27.4	1.8	1.3	1.7E-05
3	41.4	2.3	1.1	1.5E-05
4	27.4	1.8	1.3	1.7E-05
5	14.4	1.5	2.1	2.7E-05



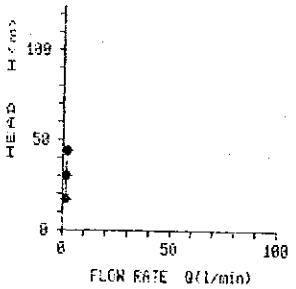
HOLE No : TB-3
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.8	1.7	2.2	2.6E-05
2	28.8	1.9	1.3	1.7E-05
3	42.8	2.2	1.0	1.3E-05
4	28.8	1.8	1.3	1.6E-05
5	15.8	1.4	1.8	2.3E-05



HOLE No : TB-3
DEPTH : 20 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.8	1.7	2.0	2.6E-05
2	29.8	1.8	1.2	1.6E-05
3	43.8	2.1	1.0	1.3E-05
4	29.8	1.7	1.1	1.5E-05
5	16.8	1.6	1.9	2.5E-05



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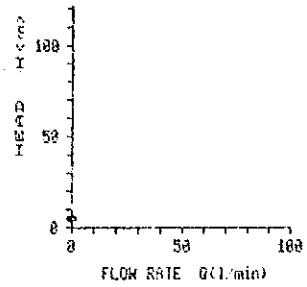
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Water Pressure Test,TB-2,TB-3 (16/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

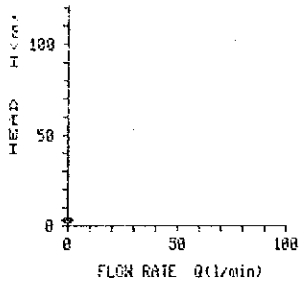
HOLE No : TB-4
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.6	0.5	3.3	3.9E-05



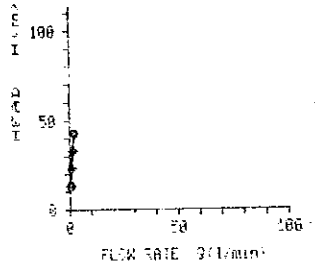
HOLE No : TB-4
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.1	0.4	4.3	5.0E-05



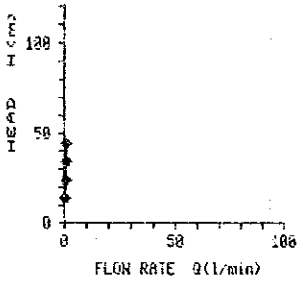
HOLE No : TB-4
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	18.4	0.9	2.2	3.6E-05
2	23.4	1.2	1.7	3.0E-05
3	28.4	1.7	1.7	3.0E-05
4	43.4	3.1	1.6	1.9E-05
5	38.4	1.4	1.4	1.6E-05
6	33.4	0.8	1.1	1.3E-05
7	28.4	0.8	1.2	2.0E-05



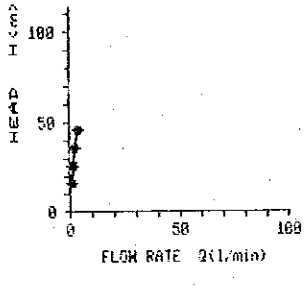
HOLE No : TB-4
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	13.7	0.6	1.9	2.3E-05
2	23.7	1.0	1.4	1.6E-05
3	33.7	1.3	1.3	1.5E-05
4	43.7	1.2	0.9	1.1E-05
5	33.7	1.0	1.0	1.2E-05
6	23.7	0.8	1.1	1.3E-05
7	13.7	0.5	1.2	1.4E-05



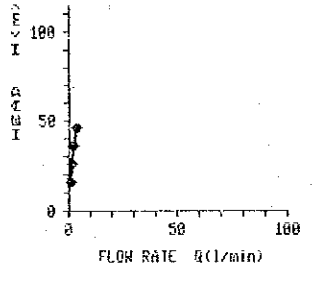
HOLE No : TB-4
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.6	1.3	1.7	2.2E-05
2	25.6	1.9	1.5	1.9E-05
3	35.6	2.8	1.6	2.1E-05
4	45.5	4.0	1.8	2.3E-05
5	35.6	2.9	1.6	2.1E-05
6	25.6	2.1	1.6	2.1E-05
7	15.6	1.5	1.9	2.5E-05



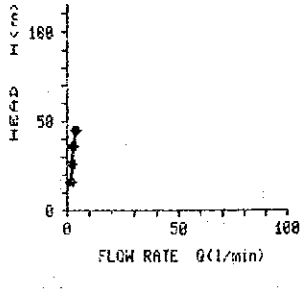
HOLE No : TB-4
DEPTH : 20 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.6	1.0	1.3	1.7E-05
2	25.6	1.5	1.2	1.5E-05
3	35.6	2.3	1.3	1.7E-05
4	45.6	3.5	1.5	2.8E-05
5	35.6	2.2	1.2	1.6E-05
6	25.6	1.3	1.0	1.3E-05
7	15.6	0.9	1.2	1.5E-05



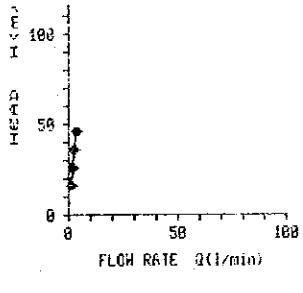
HOLE No : TB-4
DEPTH : 25 - 30 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.5	1.3	2.3	3.0E-05
2	25.5	2.1	1.6	2.1E-05
3	35.5	2.9	1.6	2.1E-05
4	45.5	4.1	1.8	2.4E-05
5	35.5	3.2	1.8	2.4E-05
6	25.5	2.5	2.0	2.6E-05
7	15.5	2.1	2.7	2.9E-05



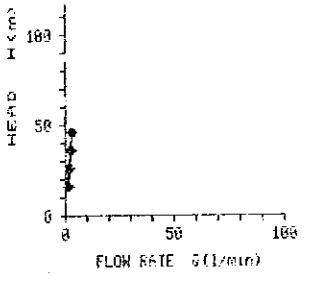
HOLE No : TB-4
DEPTH : 30 - 35 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.0	1.5	1.9	2.4E-05
2	26.0	2.0	1.5	2.0E-05
3	36.0	2.7	1.5	2.0E-05
4	46.0	3.9	1.7	2.2E-05
5	36.0	2.6	1.4	1.9E-05
6	26.0	1.8	1.4	1.8E-05
7	16.0	1.3	1.6	2.1E-05



HOLE No : TB-4
DEPTH : 35 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.7	1.7	2.2	2.8E-05
2	25.6	2.1	1.6	2.1E-05
3	35.6	2.6	1.5	1.9E-05
4	45.6	3.0	1.3	1.7E-05
5	35.6	2.5	1.4	1.8E-05
6	25.7	1.9	1.5	1.9E-05
7	15.7	1.4	1.8	2.3E-05



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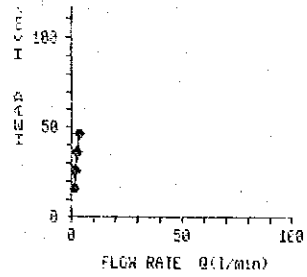
Water Pressure Test,TB-4 (17/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-23

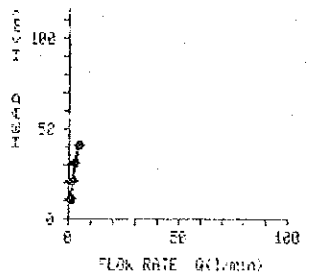
HOLE No : TB-4
DEPTH : 40 - 45 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.7	1.6	2.0	2.7E-05
2	25.6	2.1	1.6	2.1E-05
3	35.6	2.7	1.5	2.0E-05
4	45.6	3.8	1.7	2.2E-05
5	35.6	2.5	1.4	1.8E-05
6	25.7	1.9	1.5	1.9E-05
7	15.7	1.5	1.9	2.5E-05



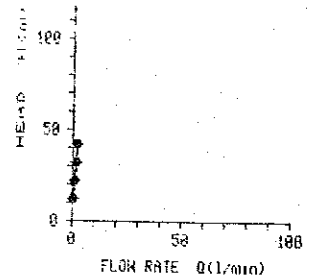
HOLE No : TB-5
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	10.6	1.2	2.3	3.0E-05
2	20.6	1.9	1.8	2.4E-05
3	30.6	2.9	1.8	2.4E-05
4	40.6	4.9	2.4	3.3E-05
5	30.6	3.1	2.0	2.6E-05
6	20.6	1.9	1.7	2.3E-05
7	10.6	1.4	2.6	3.4E-05



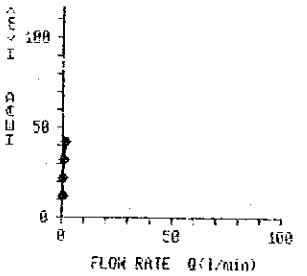
HOLE No : TB-5
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.1	0.8	1.3	1.7E-05
2	22.1	1.2	1.1	1.4E-05
3	32.1	1.9	1.2	1.5E-05
4	42.1	2.4	1.1	1.5E-05
5	32.1	1.7	1.1	1.4E-05
6	22.1	1.1	1.0	1.3E-05
7	12.1	0.9	1.5	1.9E-05



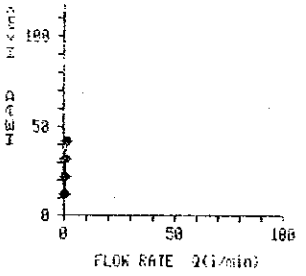
HOLE No : TB-5
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.5	0.5	0.9	1.1E-05
2	21.5	0.8	0.7	9.7E-06
3	31.5	1.1	0.7	9.1E-06
4	41.5	1.8	0.9	1.1E-05
5	31.5	0.9	0.6	7.5E-06
6	21.5	0.7	0.7	8.5E-06
7	11.5	0.6	1.0	1.4E-05



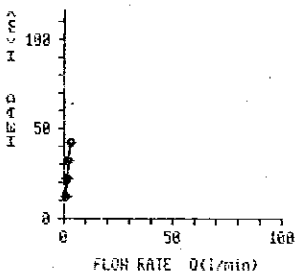
HOLE No : TB-5
DEPTH : 20 - 25 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.4	0.7	1.1	1.5E-05
2	22.4	1.1	1.0	1.3E-05
3	32.4	1.3	0.8	1.0E-05
4	42.4	1.6	0.8	9.9E-06
5	32.4	1.2	0.7	9.7E-06
6	22.4	0.8	0.7	9.3E-06
7	12.4	0.8	1.3	1.7E-05



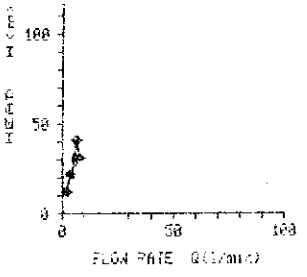
HOLE No : TB-5
DEPTH : 25 - 30 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	12.6	1.2	2.0	2.6E-05
2	22.0	1.5	1.4	1.8E-05
3	32.0	2.1	1.3	1.7E-05
4	42.0	3.0	1.4	1.9E-05
5	32.0	1.8	1.1	1.5E-05
6	22.0	1.6	1.5	1.9E-05
7	12.0	0.9	1.5	2.0E-05



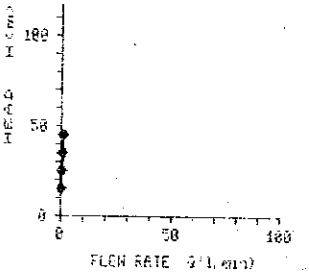
HOLE No : TB-5
DEPTH : 30 - 35 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.7	2.2	3.8	4.9E-05
2	21.6	3.9	3.6	4.7E-05
3	31.3	8.1	5.2	6.8E-05
4	41.4	6.7	3.2	4.2E-05
5	31.5	5.8	3.7	4.8E-05
6	21.6	4.1	3.8	5.0E-05
7	11.7	1.9	3.3	4.3E-05



HOLE No : TB-5
DEPTH : 35 - 40 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	14.8	0.6	0.8	1.1E-05
2	24.8	0.8	0.6	8.4E-06
3	34.8	0.9	0.5	6.8E-06
4	44.8	1.2	0.6	7.6E-06
5	34.6	1.0	0.6	7.5E-06
6	24.8	0.7	0.6	7.4E-06
7	14.9	0.4	0.5	7.1E-06



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Water Pressure Test,TB-5 (18/24)

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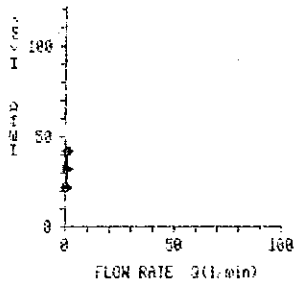
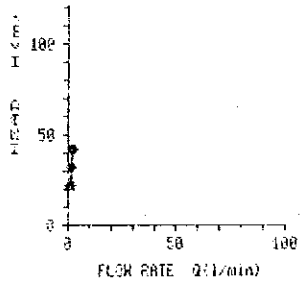
HOLE No : TB-6
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	32.3	0.5	1.3	1.6E-05
2	32.3	1.0	1.0	1.2E-05
3	42.3	1.2	0.9	1.1E-05
4	32.3	0.4	0.4	4.8E-06
5	22.3	0.4	0.6	7.8E-06



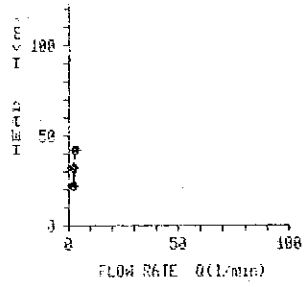
HOLE No : TB-6
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	22.4	1.4	2.1	2.4E-05
2	32.4	1.7	1.7	2.0E-05
3	42.4	2.1	1.7	1.9E-05
4	32.4	1.6	1.9	2.2E-05
5	22.4	1.5	2.4	2.8E-05



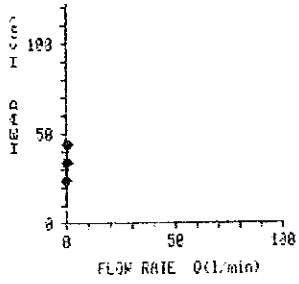
HOLE No : TB-6
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	22.4	2.0	3.0	3.5E-05
2	32.4	2.4	2.5	2.9E-05
3	42.4	3.2	2.5	2.9E-05
4	32.4	2.6	3.7	3.1E-05
5	22.4	3.3	3.4	4.0E-05



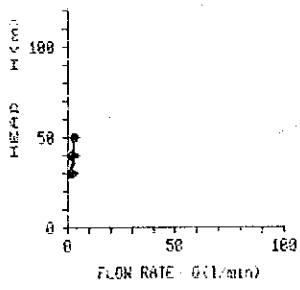
HOLE No : TB-6
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	23.9	0.4	0.6	6.5E-06
2	33.9	0.5	0.5	5.7E-06
3	43.9	0.6	0.5	5.3E-06
4	33.9	0.2	0.2	2.3E-06
5	23.9	0.1	0.1	1.6E-06



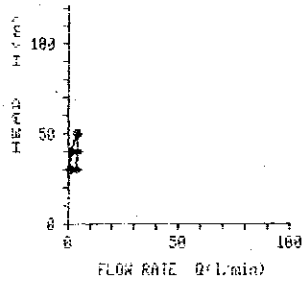
HOLE No : TB-6
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	38.3	2.8	3.1	3.6E-05
2	48.3	3.1	2.6	3.0E-05
3	58.3	3.3	2.2	2.6E-05
4	48.3	2.0	1.7	1.9E-05
5	38.3	1.9	2.1	2.4E-05



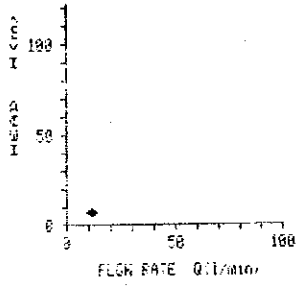
HOLE No : TB-6
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	38.3	3.5	3.8	4.5E-05
2	48.3	4.2	3.5	4.1E-05
3	58.3	4.4	2.9	3.4E-05
4	48.3	1.1	0.9	1.1E-05
5	38.3	0.9	1.0	1.2E-05



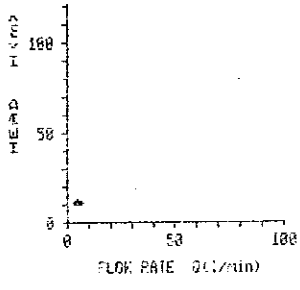
HOLE No : TB-6
DEPTH : 24 - 27 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.9	11.6	56.1	6.6E-04



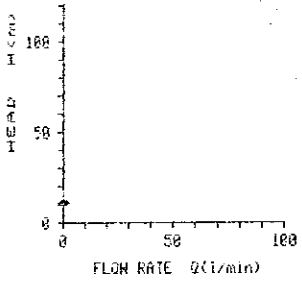
HOLE No : TB-6
DEPTH : 27 - 30 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.2	5.4	46.1	1.9E-04



HOLE No : TB-6
DEPTH : 30 - 33 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	10.6	8.4	1.2	1.4E-05



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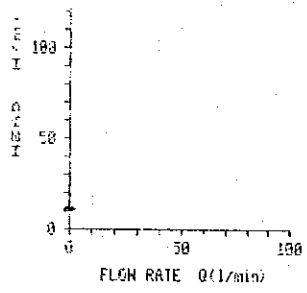
Water Pressure Test,TB-6 (19/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

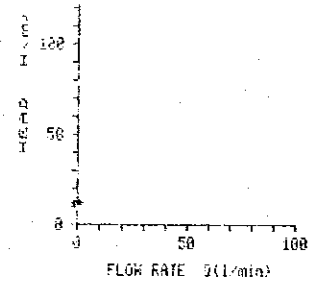
HOLE No : TB-6
DEPTH : 33 - 36 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	18.6	0.4	1.1	1.3E-05



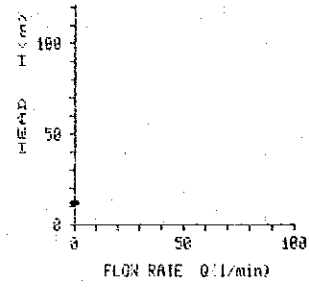
HOLE No : TB-6
DEPTH : 36 - 39 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.9	0.3	0.9	1.0E-05



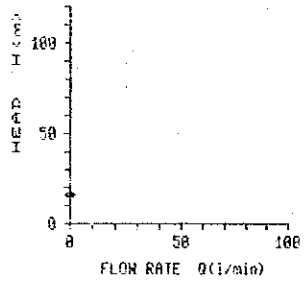
HOLE No : TB-6
DEPTH : 39 - 42 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	11.5	0.4	1.0	1.2E-05



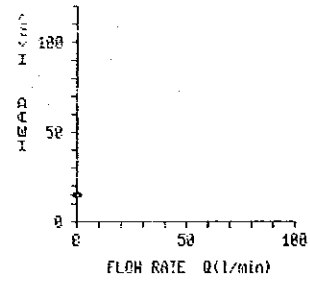
HOLE No : TB-6
DEPTH : 42 - 45 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	16.2	0.4	0.6	9.2E-06



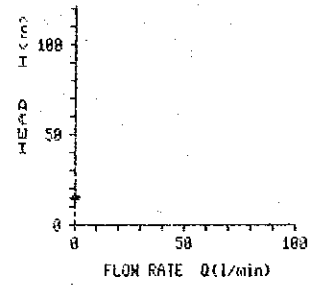
HOLE No : TB-6
DEPTH : 45 - 48 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.2	0.4	0.9	1.0E-05



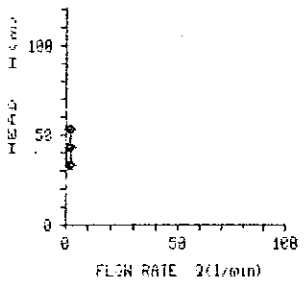
HOLE No : TB-6
DEPTH : 48 - 51 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	15.2	0.4	0.9	1.0E-05



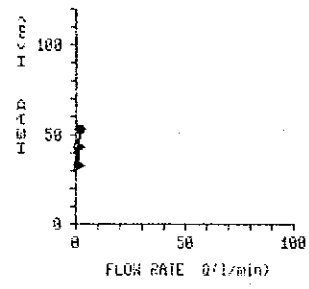
HOLE No : TB-6
DEPTH : 54 - 57 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	33.5	2.1	2.1	2.4E-05
2	33.5	2.1	2.1	2.4E-05
3	43.4	2.3	1.8	2.1E-05
4	53.4	2.4	1.5	1.8E-05
5	43.5	1.5	1.5	1.7E-05



HOLE No : TB-6
DEPTH : 57 - 60 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	33.3	1.8	1.8	2.1E-05
2	43.3	1.9	1.5	1.7E-05
3	53.3	2.0	1.3	1.5E-05
4	43.3	0.9	0.7	8.1E-06
5	33.3	0.7	0.7	8.2E-06



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Water Pressure Test, TB-6 (20/24)

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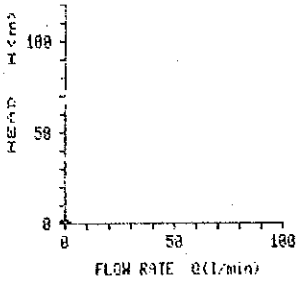
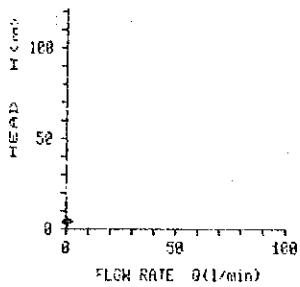
HOLE No : TB-7
DEPTH : 3 - 6 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.3	0.3	8.4	3.8E-05



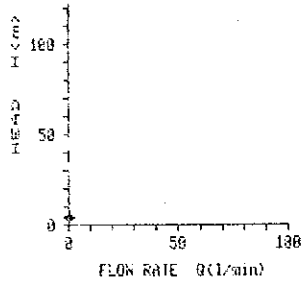
HOLE No : TB-7
DEPTH : 6 - 9 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.5	0.6	5.2	6.1E-05



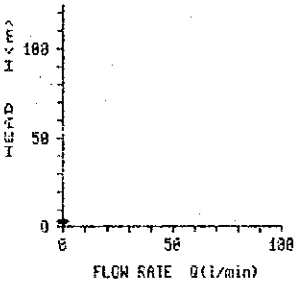
HOLE No : TB-7
DEPTH : 9 - 12 m

STEP	H (m)	Q (l/min)	Lu	K cm/sec)
1	3.5	0.2	1.9	1.9E-05



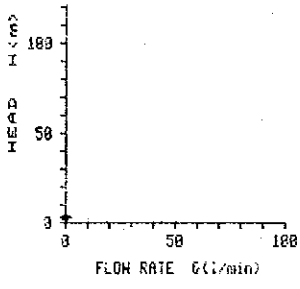
HOLE No : TB-7
DEPTH : 12 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.8	0.1	1.5	1.7E-05



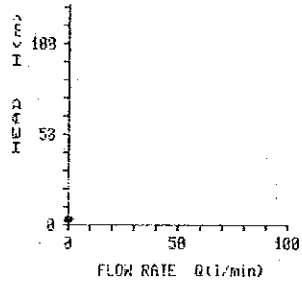
HOLE No : TB-7
DEPTH : 15 - 18 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.8	0.1	1.6	1.9E-05



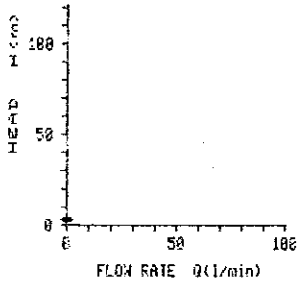
HOLE No : TB-7
DEPTH : 18 - 21 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.0	0.1	1.5	1.7E-05



HOLE No : TB-7
DEPTH : 21 - 24 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.3	3.1	1.5	1.8E-05



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Water Pressure Test,TB-7 (21/24)

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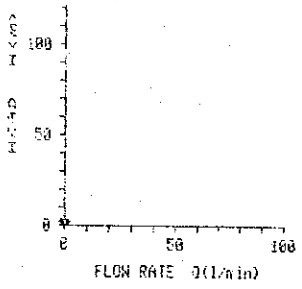
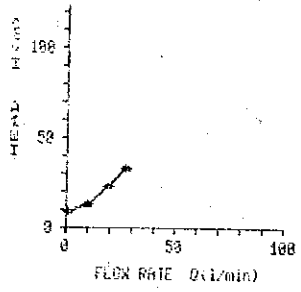
HOLE No : CCB-1
DEPTH : 0 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.5	0.8	0.2	2.1E-06



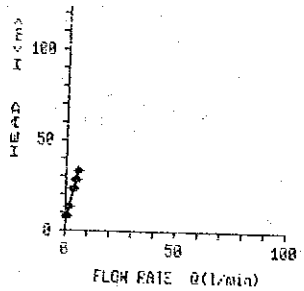
HOLE No : CCB-1
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.5	1.4	3.3	4.2E-05
2	13.4	10.4	15.5	2.8E-04
3	23.2	19.4	16.7	2.2E-04
4	33.0	27.2	16.6	2.1E-04



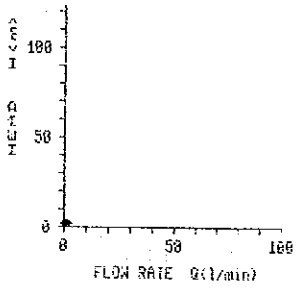
HOLE No : CCB-1
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	3.8	0.6	1.5	1.9E-05
2	13.8	1.9	2.9	3.8E-05
3	23.8	3.6	3.1	4.8E-05
4	28.8	4.6	3.3	4.5E-05
5	33.8	5.9	3.6	4.6E-05



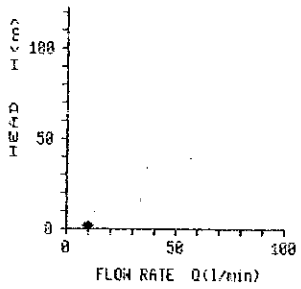
HOLE No : CCB-2
DEPTH : 0 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.9	1.1	11.5	1.5E-04



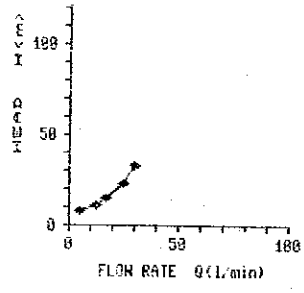
HOLE No : CCB-2
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	1.8	10.0	111.1	1.4E-03



HOLE No : CCB-2
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	8.8	5.4	13.4	1.7E-04
2	11.5	12.6	21.9	2.8E-04
3	14.8	17.2	23.2	3.8E-04
4	23.1	25.2	21.8	2.8E-04
5	32.6	30.2	18.5	2.4E-04



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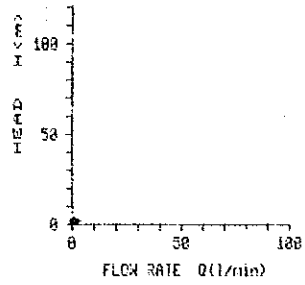
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Water Pressure Test,CCB-1,CCB-2 (22/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

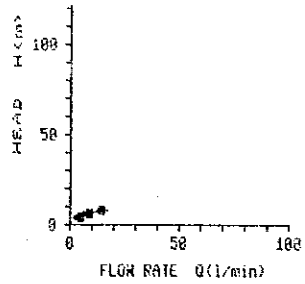
HOLE No : CCB-3
DEPTH : 0 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.5	1.2	9.6	1.2E-04



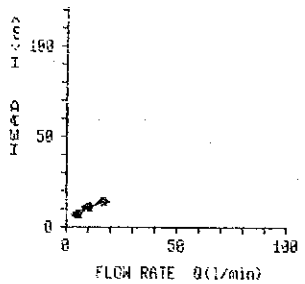
HOLE No : CCB-3
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	4.2	3.8	18.2	2.4E-04
2	5.9	7.9	26.3	3.4E-04
3	7.7	14.6	38.8	4.9E-04
4	5.9	9.8	30.4	3.9E-04
5	4.2	5.4	25.9	3.4E-04



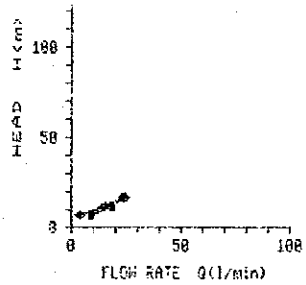
HOLE No : CCB-3
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	7.1	4.6	13.0	1.7E-04
2	10.6	9.8	16.5	2.4E-04
3	13.8	17.4	25.2	3.3E-04
4	10.6	10.6	20.8	2.6E-04
5	7.8	6.2	17.7	2.3E-04



HOLE No : CCB-3
DEPTH : 15 - 20 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	7.3	4.2	11.5	1.5E-04
2	12.1	15.6	25.7	3.3E-04
3	16.6	24.2	29.2	3.8E-04
4	11.8	18.6	31.5	4.1E-04
5	7.1	9.2	25.9	3.4E-04



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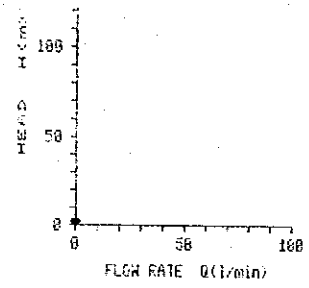
FEASIBILITY STUDY ON KARIAN
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Water Pressure Test,CCB-3 (23/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

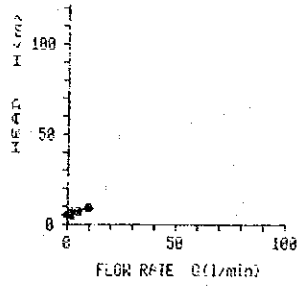
HOLE No : CCB-4
DEPTH : 0 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.5	0.8	0.3	4.9E-05



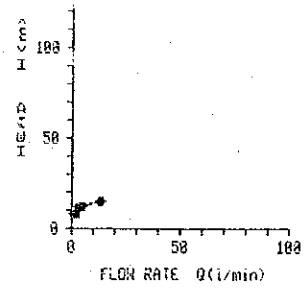
HOLE No : CCB-4
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.1	0.4	1.6	2.0E-05
2	5.9	2.0	5.8	7.5E-05
3	6.7	4.0	20.5	2.9E-04
4	6.9	5.2	15.1	2.0E-04
5	5.1	3.0	7.8	1.0E-04



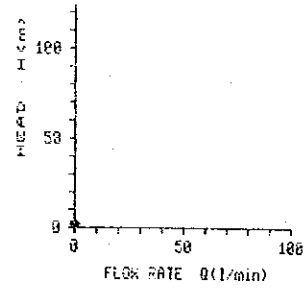
HOLE No : CCB-4
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	8.4	1.2	2.9	3.7E-05
2	12.1	3.8	6.3	8.1E-05
3	15.3	13.6	17.7	2.3E-04
4	12.8	5.4	9.8	1.2E-04
5	8.4	2.6	6.2	8.0E-05



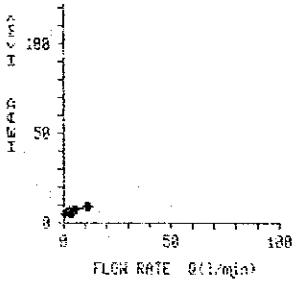
HOLE No : CCB-5
DEPTH : 0 - 5 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	2.5	0.1	1.0	1.2E-05



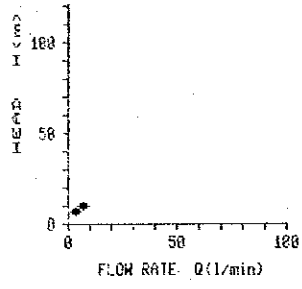
HOLE No : CCB-5
DEPTH : 5 - 10 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	5.2	1.2	4.6	6.0E-05
2	7.9	2.8	8.8	1.0E-04
3	8.8	11.2	25.5	3.3E-04
4	7.0	5.4	15.5	2.0E-04
5	5.2	3.8	14.7	1.9E-04



HOLE No : CCB-5
DEPTH : 10 - 15 m

STEP	H (m)	Q (l/min)	Lu	K (cm/sec)
1	6.5	3.8	11.7	1.5E-04
2	10.1	7.4	14.6	1.9E-04



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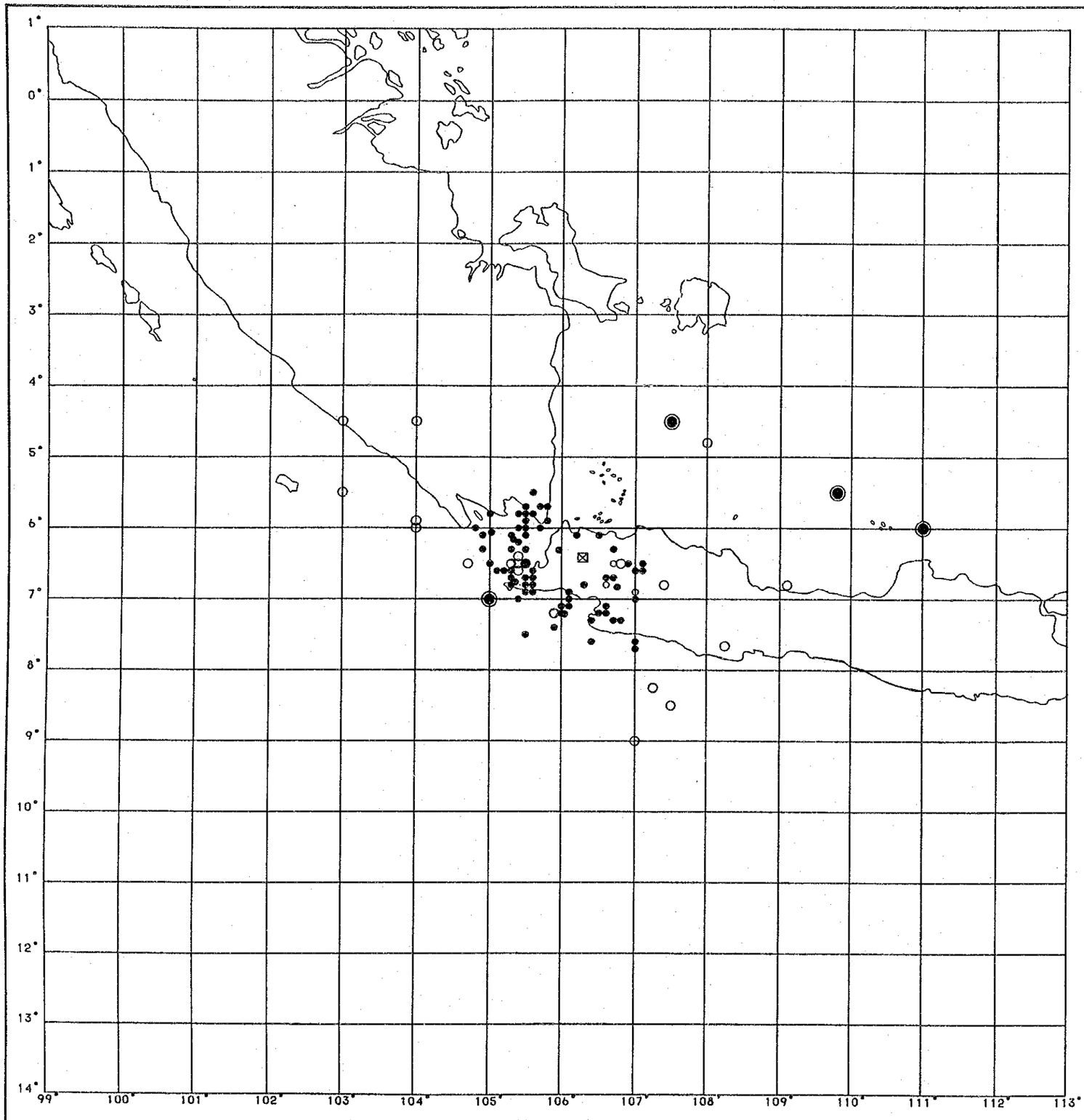
Water Pressure Test,CCB-4,CCB-5 (24/24)

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-24



Explanation of Marks

⊠ ; Location of Proposed Damsite

○ ~ ◉ ; Epicenters and Magnitude M of Earthquakes
(data during the period 1948 to 1979 from "Earthquakes in Indonesia")

○ M < 5

● 5 ≦ M < 6

○ 6 ≦ M < 7

◉ 7 ≦ M < 8 (Magnitude in Richter Scale)

KARIAN DAMSITE

S C A L E

0 500km

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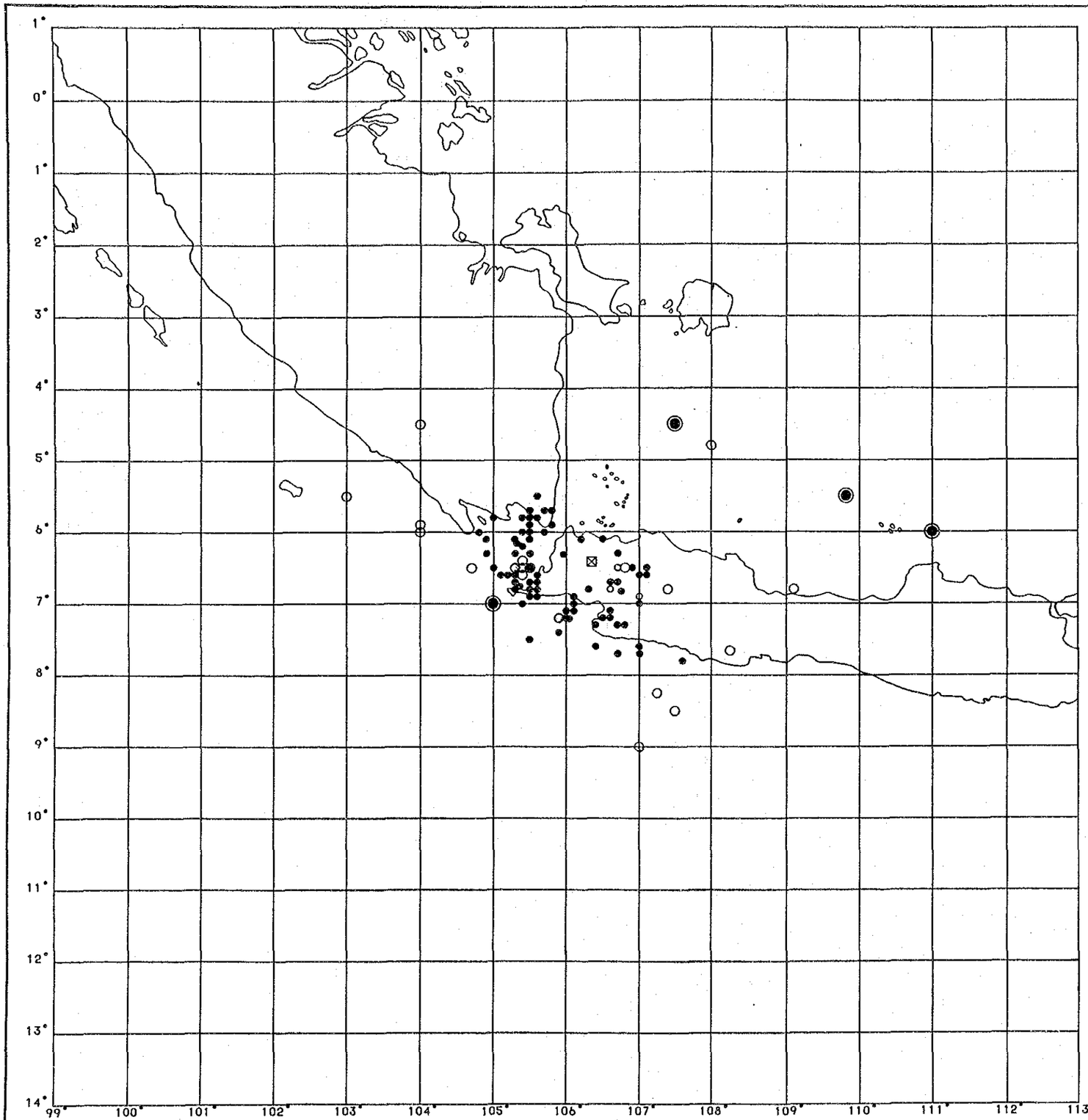
FEASIBILITY STUDY ON KARIAN
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Epicenter of Influency Earthquake of Karian Dam Site

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.C-25



Explanation of Marks

⊠ ; Location of Proposed Damsite

○ ~ ◉ ; Epicenters and Magnitude M of Earthquakes
(data during the period 1948 to 1979 from "Earthquakes in Indonesia")

○ M < 5

● 5 ≦ M < 6

○ 6 ≦ M < 7

◉ 7 ≦ M < 8 (Magnitude in Richter Scale)

CILAWANG DAMSITE

S C A L E

0 500km

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FEASIBILITY STUDY ON KARIAN
MULTIPURPOSE DAM CONSTRUCTION PROJECT

Epicenter of Influency Earthquake of Cilawang Dam Site

JAPAN INTERNATIONAL COOPERATION AGENCY

A N N E X

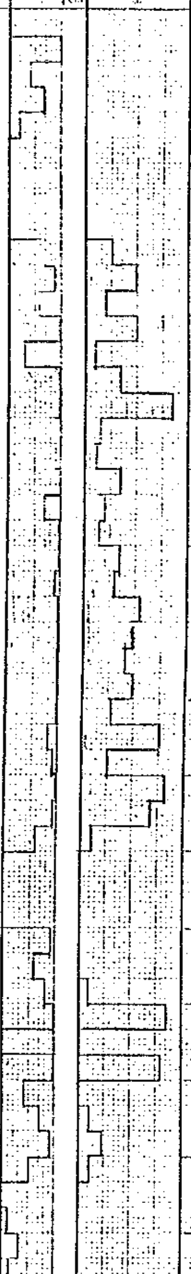
DRILL LOG

HOLE NO. KB I   SHEET NO. 2 OF 22

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	50 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM July 20 TO Aug. 5. 1982	DRILLED	G. EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL
July 20	1.00		Top Soil		Brown soft		
	3.00		Residual Soil		Tuffaceous, sandy clay [illegible] brown	D	
July 26, July 27	12.00		Sandstone		Tuffaceous. Very-fine grained with clay and gravel contain rich pumice fragments, light brown, modelately weathered, well sorted laminated, partly stained [illegible] iron [illegible]	CL	
July 27, July 28	16.70		Lapilli tuff		Slightly weathered Contain pumice, well bedded upper part rather clayey and soft, Lower part, dence compat. dusky yellow to gray	CM	
July 28, July 29, July 30	29.00		Claystone interstratification of sandstone and pumice tuff		Tuffaceous, slightly to moderately weathered. Compat, partly fractured with pumice fragments and frangible, light olive brown to dusky yellow	CL	
Aug. 1, Aug. 2, Aug. 3	38.50		Pumice tuff		Modelately weathered mostly compact and dense contain lapilli, partly (32.00~38.00m) loose and frangible gray	CM / CL	
Aug. 4	41.40		Claystone		Tuffaceous. Hard to modelately weathered Compact, partly cracky olive yellow to dusky yellow	CL	
Aug. 4, Aug. 5	46.00		Pumice tuff		Hard weathered, fractured contain [illegible], dusky yellow to yellow		
Aug. 5	50.00		Claystone		Hard weathered, fractured, Contain some lapilli frangible, partly contain sandy material, olive gray [illegible]		

CORE RECOVERY (cm) / R.Q.D



WATER PRESSURE TEST / LUGEON VALUE

N-value

- $K = 2.1 \times 10^{-4}$ cm/sec
- $K = 9.4 \times 10^{-5}$ cm/sec
- $K = 4.4 \times 10^{-5}$ cm/sec
- $K = 1.2 \times 10^{-4}$ cm/sec
- $K = 1.0 \times 10^{-5}$ cm/sec
- $K = 2.3 \times 10^{-6}$ cm/sec
- $K = 7.6 \times 10^{-5}$ cm/sec
- $K = 4.8 \times 10^{-5}$ cm/sec
- $K = 3.4 \times 10^{-5}$ cm/sec
- $K = 7.4 \times 10^{-5}$ cm/sec
- $K = 5.3 \times 10^{-4}$ cm/sec
- $K = 1.3 \times 10^{-4}$ cm/sec
- $K = 6.6 \times 10^{-5}$ cm/sec
- $K = 8.3 \times 10^{-5}$ cm/sec
- $K = 4.1 \times 10^{-5}$ cm/sec
- $K = 7.9 \times 10^{-6}$ cm/sec

HOLE NO KB I

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

• Source : Ref. 1 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 2 SHEET NO. 2 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	60 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	45°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM July 20 TO Aug. 6 1982	DRILLED	G. EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	DESCRIPTION	ROCK GRADE
July 20	7.00		clay	brown soft, plastic	D
July 26	9.00		Residual Soil	Tuffaceous clay contain pumice light olive brown	
	14.60		Pumice tuff	Hard to Moderately weathered laminated partly contain lapilli and gravel, stained color by iron ion	
July 27	20.00		claystone	Tuffaceous, poor cemented fragmental, partly contain gravel and charcoal fragment. light brown	CL
July 28	22.70		Sandstone	Tuffaceous, very fine pumice, slightly weathered partly (20.5 – 21.0) contain hard rounded gravel. brown	
	25.00		Conglomerate		
July 29	31.00		welded tuff	Tuffaceous, poor cemented matrix consist of Tuffaceous sand and silt. Fragments consist of sub-angular to sub-rounded basalt and andesite, some silica. brown to gray	
July 30			claystone	pumiceous, compact, soft slightly weathered, partly contain lapilli light olive gray to brown	CM
Aug. 1	37.10			Tuffaceous, well bedded partly contain pumice and sand, compact. medium bluish gray. Interbedded	CL
Aug. 2	41.40		pumice tuff	Hard weathered, fractured and frangible, dusky yellow pumice tuff	
			Claystone	Moderately weathered, rather sticky, dusky yellow	CM
Aug. 3	47.00			Tuffaceous, well bedded partly contain pumice and lapilli, compact. soft, light olive brown	
	48.10		Pumice tuff	Hard weathered, light weight soft, fractured, light olive brown	CL
Aug. 4			Claystone	Tuffaceous, soft, rather compact partly sandy dusky yellow	
Aug. 5	57.20				
Aug. 6	60.00		Sandstone	Tuffaceous, contain pumice, compact, well bedded and laminated light olive gray	CM / CL

WATER PRESSURE TEST – LUGEON VALUE (from top to bottom):

- K = 9.7 × 10^{-5} cm/sec
- K = 6.5 × 10^{-5} cm/sec
- K = 3.1 × 10^{-4} cm/sec
- K = 3.2 × 10^{-4} cm/sec
- K = 3.5 × 10^{-4} cm/sec
- K = 4.6 × 10^{-4} cm/sec
- K = 5.8 × 10^{-5} cm/sec
- K = 8.4 × 10^{-5} cm/sec
- K = 3.6 × 10^{-5} cm/sec
- K = 8.0 × 10^{-5} cm/sec
- K = 3.0 × 10^{-4} cm/sec
- K = 5.4 × 10^{-4} cm/sec
- K = 1.2 × 10^{-4} cm/sec
- K = 1.0 × 10^{-4} cm/sec
- K = 7.5 × 10^{-5} cm/sec
- K = 8.6 × 10^{-5} cm/sec
- K = 8.0 × 10^{-5} cm/sec
- K = 7.8 × 10^{-5} cm/sec

HOLE NO KB2

LOG FORM–B

* R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
* LUGEON VALUE is 1 l/min/m under injection water pressure of 10kg/cm²
* DEPTH and ELEVATION are in meter

* Source : Ref. 1 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB3 SHEET NO. 3 OF 23

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	50m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Aug 8 '82 TO Aug 23 '82	DRILLED	G. EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY	R.Q.D	WATER PRESSURE TEST LUGEON VALUE
Aug. 8, 9, 10	0.50		Top Soil		soft, brownish gray					N-value
Aug. 10, 11	6.00		Redsiual soil		Tuffaceous sandy silt soft, cohesive, dusky yellow to brownish gray					K = 1.5 × 10⁻⁵ cm/sec
Aug. 11, 12, 13, 14, 15	10 17.20		Conglomerate (sand and gravel)		Tuffaceous poor cemented, Semi rounded gravel and sand, loose dusky yellow	D				K = 1.6 × 10⁻⁵ cm/sec K = 1.3 × 10⁻⁵ cm/sec K = 8.8 × 10⁻⁵ cm/sec K = 2.1 × 10⁻⁵ cm/sec
Aug. 16	19.00		Claystone		Tuffaceous, hard weathered fractured, brown	CL				K = 2.1 × 10⁻⁵ cm/sec
	20.10		Claystone		Tuffaceous, dense, compact whitish gray	CM				
Aug. 18	21.70		Sandstone		Tuffaceous, fine grained partly contain lapilli					K = 7.3 × 10⁻⁵ cm/sec
	25.00		Conglomeratic		weakly cemented, partly very loose, gray					K = 1.3 × 10⁻⁵ cm/sec
Aug. 19, 20	31.40		Lapilli tuff		Hard weathered, weakly cemented, contain some gravel light gray	CL				K = 3.5 × 10⁻⁵ cm/sec K = 4.5 × 10⁻⁵ cm/sec
Aug. 21, 22, 23	50.00		Pumice tuff interclated fine sandstone and claystone		Slightly weathered partly weakly cemented contain lapilli (47–49.6) lower portion (49.6–60m) fine grained sandstone light olive gray to gray	CM CL CM CL				K = 3.6 × 10⁻⁵ cm/sec K = 2.1 × 10⁻⁵ cm/sec K = 3.0 × 10⁻⁵ cm/sec K = 1.5 × 10⁻⁵ cm/sec K = 4.1 × 10⁻⁵ cm/sec NO TEST
					Bit diameter 73 mmφ					

HOLE NO. KB3

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm) / (Total core length) × 100%.
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

• Source : Ref. 1 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 4 SHEET NO. 4 OF

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	50 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Aug. 8 TO Aug. 15, 198_	DRILLED	G. EPSILON	LOGGED	-X-

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY	R. Q. D	WATER PRESSURE TEST LUGEON VALUE
	2.0		Soil		Clay, soft, brown					N-value
Aug. 8	5.2		Residual Soil		Tuffaceous weathered claystone, rather soft yellow brown	D				
Aug. 9			Claystone		Tuffaceous, hard weathered partly contain lapilli and intercalated sandstone. yellow brown to white gray	C_L				$K=7.3\times10^{-4}$ cm/sec; $K=3.4\times10^{-4}$ cm/sec
	12.0				Moderately to slightly weathered, contain lapilli light gray					$K=2.0\times10^{-4}$ cm/sec
Aug. 10	14.7		Pumice tuff							$K=2.2\times10^{-4}$ cm/sec
			Claystone		Tuffaceous, compact, dense, dusky yellow	C_M				$K=1.9\times10^{-5}$ cm/sec
	19.5				Compact, partly hard weathered, white gray					$K=9.6\times10^{-5}$ cm/sec
Aug. 11	21.2		Pumice tuff							
	23.0		Claystone		Tuffaceous, frangible rather soft. weathered dusky yellow					$K=5.4\times10^{-5}$ cm/sec
Aug. 12	29.0		Lapilli tuff		Moderate weathered weakly cemented intercalated tuffaceous sandstone gray					$K=3.2\times10^{-4}$ cm/sec; $K=2.7\times10^{-4}$ cm/sec
Aug. 13	32.6		Claystone		Moderate weathered. cracky. Tuffaceous partly sandy, dark brown					$K=4.2\times10^{-4}$ cm/sec
	37.3		Sandstone		Slightly weathered, fine to very fine grained, weakly cemented, friable, white gray. Tuffaceous	C_L				$K=3.3\times10^{-4}$ cm/sec; $K=6.9\times10^{-4}$ cm/sec
Aug. 14	41.0		Pumice tuff		Slightly weathered, frangible, rather soft. white gray					$K=8.6\times10^{-4}$ cm/sec
	42.4		Claystone		Tuffaceous. rather compact light olive brown					
Aug. 15	50.0		Pumice tuff		Slightly to moderate weathered, contain lapilli and volcanic sand, loose and friable, white gray to dusky yellow					$K=7.9\times10^{-4}$ cm/sec; $K=7.2\times10^{-4}$ cm/sec
					Bit diameter					

HOLE NO. KB4

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 1 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB5 SHEET NO. 5 OF 23

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	25 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Sep. 11 TO Sep 14, 1982	DRILLED	∝ EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY % / cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Sep. 11	1.0		Top Soil		clay, gray						
	3.6		Lapilli tuff		weathered, loose, fine grained volcanic sand, light olive gray	D					
Sep. 12			claystone		Tuffaceous, compact, fragile, chalky, moderately weathered, rich joint, partly fractured, and intercalated pumice tuff (8.5–8.8 m, 10–10.5 m), white gray	C_L				5.9, 4.9, 15.1, 13.5	
Sep. 13	16.5										
Sep. 14			Pumice tuff		Slightly weathered, compact, well cemented, massive, white gray	C_M				22.8, 21.1	
	23.4				Tuffaceous, Moderately weathered, fractured, white gray	C_L	▽			10.4	
	25.0		claystone								

HOLE NO. KB5

LOG FORM--B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

• Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB6 SHEET NO. 6 OF

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	35 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE : :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE FROM Sep. 4 TO Sep. 9, 1982	DRILLED	G. EPSILON	LOGGED	K

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DISTRIBUTION
Sep. 4			Pumice tuff		Hard weathered, contain lapilli, compact, massive fine grained, partly fractured white gray	C_L				3.9	
Sep. 5	10.0		claystone		Tuffaceous, weathered, rather loose partly sandy and frangible light olive gray					2.9	
Sep. 6	14.0		Lapilli tuff		Moderate weathered, pumice contain, generally compact and massive	C_M	▽			2.5	
Sep. 7					22.2 – 23.7 m. Consists of volcanic ash, light weight					2.3	
Sep. 8					16.0 – 20.0 m rather hard with stained color joint	C_L				2.1	
Sep. 9					26.3 – 29.0 m compact and massive well cemented	C_M				3.0	
					color : white gray to dark gray partly stained brown color	C_L				4.6	
	32.7				Tuffaceous, fractured laminated intercalated claystone, slightly weathered	C_M				5.7	
	35.0		Sandstone			C_L				4.2	
										5.5	

HOLE NO. KB6

LOG FORM-B

※R.Q.D is Rock Quality Designation, R.Q.D= (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

* Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB7 SHEET NO. 7 OF 73

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	60m	ELEVATION	
SITE	KARIAN DAM SITE	COORDINATE	: :	INCLINATION	60°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Aug.20 TO Sep.4 1982	DRILLED	SHIBUYA	LOGGED	Y

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Aug.20	5.0		Residual soil		Top soil, charcoal material. Tuffaceous weathered clay-stone contain sand and gravel, yellow brown	D	▽				20.1	
Aug.21	7.8		Gravel & sand		Fresh, subrounded to rounded, andesite hard gray						29.6	
Aug.24	10.5		Lapilli tuff		weathered, rich joint cracky, rather hard dusky yellow						32.5	
Aug.31	14.4		claystone		Completely weathered, completely fractured, dusky yellow						45.4	
Aug.7	21.0		Lapilli tuff		Moderately weathered contain granule gravel fragments consists of fresh hard rock gray to dark brown	C_L					73.9	
Aug.28	24.8		Pumice tuff		Moderately weathered, contain granule gravel loose and fractured white gray						88.2	
Aug.27	30.0		claystone		Tuffaceous, slightly weathered, contain some pumice, rather massive but some cracks white gray	CM					65.9	
Aug.30	41.5		pumice tuff		Hard to moderately weathered crack develp. contain volcanic sand and lapilli some slicken side exist, 30-32m, 34-36m. No core 37.7-34.5m, 36.4-37.0m, 38.0-38.7m, 39.2-40.0m. olive brown to dusky yellow	C_L					26.1	
Aug.31	46.0		claystone		Tuffaceous, hard to moderately weathered, fractured and cracky but very dense slicken side exist, 41-42m. olive brown						20.4	
Sep.1	60.0		pumice tuff		Hard to moderately weathered cracky and fractured but partly compact and dense 49.4-50.4m light weight crack joints stained brown color. gray to light gray						11.9	
Sep.2											21.7	
Sep.3											25.7	
Sep.4											13.9	
											19.3	
											12.5	
											15.8	
											17.4	
											18.5	

HOLE NO. KB7

LOG.FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 8 SHEET NO. 8 OF 13

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	35 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Sep. 7 TO Sep. 11, 82	DRILLED	G. EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Sep. 7	2.0		Top soil		Gray, soft	D						
	3.0		Residual soil		Weathered tuffaceous clay, white gray							
	6.2		Lapilli tuff		Moderately weathered Contain numerous pumice cracky, rather hard Compact, gray						25.2	
Sep. 8	9.6		Claystone		Slightly to moderately weathered, compact, not cracky, joint develop stained by brown color							
	16.0		Pumice tuff		Moderately weathered, cracky, partly fractured, mainly consists of fine grained tuff, gray		▽				6.8	
Sep. 9	19.3		Lapilli tuff		Pumiceous, well sorted moderately weathered cracky, gray color partly stained brown color	CL					No Test	
	21.4		pumice tuff		Moderately weathered, cracky, and fractured light gray to brown						24.3	
Sep. 10	24.5		claystone		Tuffaceous, cracky moderately weathered light olive brown to gray							
	28.0		Pumice tuff		Moderately weathered, mainly consists of fine grained tuff lower part fractured, light to white gray						24.0	
Sep. 11	31.6		Claystone		Hard to moderately weathered, cracky and develop joint frogiable brown. Tuffaceous						26.6	
	35.0		Pumice tuff		Hard to moderately weathered porous, cracky, frangible, ragged flakes of pumice light olive brown							

HOLE NO. KB 8

LOG FORM-B

※R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
※LUGEON VALUE is l/min·m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

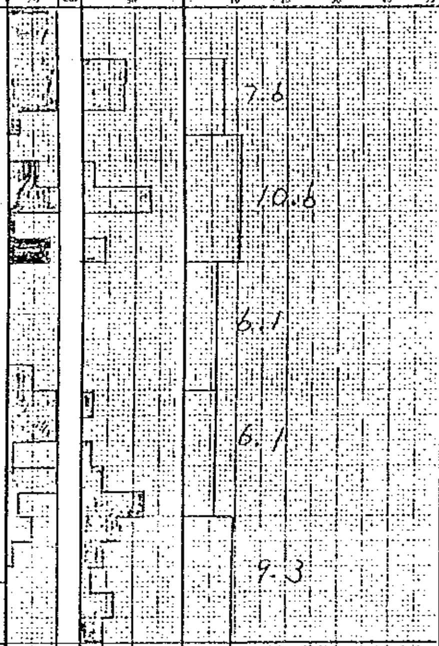
* Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB9 SHEET NO. 9 OF

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	25 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Sep.14 TO Sep.17 1982	DRILLED	G. EPSILON	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL
Sep.14	3.6		claystone		hard to moderately weathered frangible, tuffaceous, white gray	CL	
Sep.14	4.8		lapilli tuff		Completely weathered. ragged flakes of lapilli light olive gray	D	
Sep.15	10.0		Sandstone		Hard to moderately weathered Tuffaceous, fine grained Compact contain numerous pumice, white gray	CL	
Sep.16, Sep.17	25.0		Pumice tuff		hard to moderately weathered cracky but compact rather light weight mainly consists of fine grained tuff intercalated tuffaceous claystone (22.3-23.2 m) gray to light gray cuttings: 10 - 14 m.		▽



HOLE NO. KB9

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB10 SHEET NO. 10 OF 70

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	60 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	60°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Aug.20 TO Aug.30, 1982	DRILLED	G. EPSILON	LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY (% / cm)	R.Q.D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Aug.20	3.0		Top soil		clay, plastic soft brown	D	∇				
	6.6		Sand and gravel		Loose, fragments consist of basalt mixed with brown clay	D				111.2	
Aug.21	9.25		gravel and boulder		Hard and moderately fresh gravel, max. dia 5 cm rather compacted	D				125.0	
Aug.22	15.5		claystone		Tuffaceous compact moderately weathered partly contain breccia exist stained joint, brown (12.7–13.4 m)					13.0; 24.6	
Aug.23	21.0		Sandstone		Tuffaceous, fine grained moderately weathered partly laminated – gray cuttings: 16–19 m					35.4; 76.2	
Aug.24, Aug.25	33.0		Pumice tuff		Hard to moderately weathered, cracky and numerous joint, laminated gray to white gray intercalated tuffaceous claystone (27–29.5 m)	CL				44.2; 40.6; 44.1; 21.3	
Aug.26	41.8		claystone		Tuffaceous strongly weathered, contain numerous pumice, and frangible, very cracky and numerous joint very poor RQD					37.7; 35.4; 62.1	
Aug.27	48.5		Pumice tuff		Moderately to slightly weathered, cracky, white gray, good RQD	CM				35.6; 5.1	
Aug.28, Aug.29	57.7		claystone		Tuffaceous, compact massive, rather strong slightly weathered, several joints stained brown color, a little contain pumice light gray	CL; CM				2.1; 30.0; 22.2	
Aug.30	60.0		welded tuff		Hard to moderately weathered, compact but fragiable joint partly contain pumice, light olive brown	CL				23.1	

LOG FORM-B

HOLE NO. KB10

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 2 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 1 SHEET NO. 11 OF 23

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	55 m	ELEVATION
SITE	KARIAN OLD SITE	COORDINATE : :	INCLINATION	90°	DRILL RIG
AVERAGE CORE RECOVERY		DATE FROM Dec.19 TO Dec.29 1983	DRILLED	DPM A	LOGGED

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
	0		Top soil		Weathered Tuffaceous clay soft, white gray	D					K = 2.9 x 10⁻⁵ cm/sec	
Dec.20	6.5		claystone		Tuffaceous, hard weathered frangible, light weight light gray	CL					2.2	
	7.8		Pumice tuff		Hard weathered, fine to coarse grained, stained brown color, laminated light olive brown						1.8	
Dec.21	12.0		claystone		Tuffaceous, slightly weathered, compact, lower part notice sandy light brown	CM	▽				2.3	
Dec.22	16.0		Sandstone		Tuffaceous, slightly weathered, fine grained light olive brown soft	CL					2.7	
	16.6		conglomerate		Loose, hard, granule (5 mm ~ 3 cm ϕ), dark yellow						1.2	
	19.6		claystone		Tuffaceous, weathered partly sandy and fractured dusky yellow	CM					1.2	
	21.0		Sandstone			CL						
Dec.23			Pumice tuff		Tuffaceous, coarse grained contain pumice and breccia compact, olive brown	CM					2.4	
					Slightly weathered, compact rather soft, light olive brown, interclated Tuffaceous claystone (24.7 – 26.0 m)	CL					2.4	
Dec.24	30.0					CM					1.0	
	32.2		Sandstone		Tuffaceous, fine to very fine grained, weathered soft, light gray	CL					2.2	
Dec.25			Pumice tuff		Slightly weathered, weakly cemented, frangible, soft light gray						3.4	
Dec.26	38.5		claystone		Tuffaceous, partly contin pumice, weathered, light gray.	CM					4.9	
Dec.27	40.7		Pumice tuff		Slightly weathered, weakly cemented, light weight, porous, laminated, well sorted, gray to stained dusky yellow color	CL					24.8	
Dec.28	51.0		Pumice tuff		Contain fine to medium volcanic sand compact dark olive gray	CM					5.5	
	54.0		Lapilli tuff		Moderate weathered, Contain conglomeratic breccia dusky yellow, clayey	CL					1.1	
	55.0										5.6	
											3.9	

HOLE NO. KB 11

LOG FORM-B

*R.Q.D is Rock Quality Designation, R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 12 SHEET NO. 12 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	20 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Dec 10 TO Dec 12 1983	DRILLED	DPMA	LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Dec. 10	1.1		Top Soil		grayish brown, soft						28.0	
	5.4		gravel and sand		granule gravel to cobble with sand. consists of basalt, andesite and silica						6.1	
	8.8		Lapilli Tuff		Slightly weathered, contain granule gravel, partly well bedded. dusky yellow to olive brown	CM	▽				4.0	
Dec. 11	11.0		claystone		Tuffaceous, soft, dusky yellow						3.6	
	14.3		Sandstone		Tuffaceous, weakly cemented, contain gravel moderately weathered						32.2	
	15.0		claystone		Tuffaceous, contain some charcoal fragments	C_L						
Dec. 12	19.0		Sandstone		Tuffaceous, fine grained contain some pumice with rich quartz						10.5	
	20.0		claystone		Tuffaceous, weathered contain some gravel fragment						7.5	

HOLE NO. KB 12

LOG FORM-B

※R.Q.D is Rock Quality Designation, R.Q.D= (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 13 SHEET NO. 1 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	15m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE : :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE FROM Dec.14 TO Dec.16	DRILLED	DPMA	LOGGED	X

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Dec. 14	2.5		clay stone		Tuffaceous, weathered, contain lapilli and sand fractures, light olive gray	D CL				50	10 20 30 40 50	
	5.7		Sandstone		Tuffaceous, slightly weathered, fine grained partly contain clay light olive brown	CM	▽				1.4	
Dec. 15	8.0		Conglomerate		Weakly cemented, consists of andesite, silica and pumice fragments and dusky yellow	CL					2.3 3.3	
	10.0		pumice tuff								3.9	
Dec. 16	15.0		Lapilli tuff		Weakly cemented, weathered, showing only cuttings light olive gray						2.0	
					Loose, contain pumice and gravel, light olive gray							

HOLE NO. KB 13

LOG FORM-B

※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 14 SHEET NO. 14 OF [illegible]

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	30 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Jan. 1 TO Jan. 4 1984	DRILLED	DPMA	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL
Jan. 1	0.5		Top soil		grayish brown, soft	D	
	1.8		clay		weathered tuffaceous clay, whitish gray	CL	
	7.7		pumice tuff		Slightly weathered, compact, well sorted, contain lapilli, well cemented, light olive brown to stained dusky yellow color	CM	
	10.7		claystone		Tuffaceous, slightly weathered, compact, whitish gray	CL	
Jan. 2	13.7		sandstone		Tuffaceous, [illegible] compact, weathered, light olive brown	CM	▽
	15.6		claystone		Tuffaceous, slightly weathered, compact, whitish gray	CL	
	17.0		pumice tuff		weathered, weakly cemented, light gray, softly stained by brown color	CL	
	20.0		claystone				
Jan. 3 – Jan. 4	30.0		[illegible]		Tuffaceous, weathered, [illegible] soft, [illegible] olive brown to dusky yellow; weathered matrix, and [illegible] hard andesite and [illegible] weakly cemented, contain some pumice.	CL ~ D	

WATER PRESSURE TEST – LUGEON VALUE (scale 10–50):

Depth interval (m)	Lugeon value
to about 2.5	1.8
about 5–8	0.7
about 8–10.5	0.7
about 10.5–13	0.1
about 13–15.5	1.6
about 15.5–18	6.2
about 18–20.5	2.5
about 20.5–23	283.2
about 23–30	NO TEST

HOLE NO. KB 14

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB 15 SHEET NO. 1 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	25 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Jan 5 TO Jan 8, 1982	DRILLED	DPMA	LOGGED	*

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Jan. 5	2.5		Topsoil		grayish brown, clay, soft plastic	D					K = 7.0 × 10⁻⁷ cm/sec	
	5.3		Sandstone		Hard weathered, tuffaceous loose, light olive brown	CL					5.5	
Jan. 6	10.0		clay stone		Tuffaceous, compact, massive, chacky, whitish gray	CM					1.5	
Jan. 7	16.1		pumice tuff		Slightly weathered, compact contain lapilli, partly porous and fractured, joint rich exist, and triangular, partly showing cross laming	CL	▽				12.8	
	21.0		clay stone		Tuffaceous, compact, massive, partly fractured (19.3 – 19.7 m) light olive gray	CL					2.2	
Jan. 8	23.8		pumice tuff		Slightly weathered, compact massive, contain lapilli light olive brown	CM					1.3	
	25.0		clay stone		Tuffaceous, compact, massive, many joints exist, light olive gray	CL					1.1	
											17.9	

HOLE NO. KB 15

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB16 SHEET NO. 1 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	25 m	ELEVATION	
SITE	KARIAN OLD SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM Jan. 9 TO Jan. 13 1984	DRILLED	DPM1A	LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Jan. 9	2.5		Top soil		grayish brown, soft	D						
Jan. 10	7.4		Claystone		Tuffaceous, hard weathered weakly cemented contain lapilli, light olive brown						32.3	
	10.0		Lapilli tuff		Weathered, contain pumice and granule gravel light olive brown						32.2	
Jan. 11			Pumice tuff		Hard weathered, weakly cemented, loose, mostly yellow, partly contain lapilli	CL	▽				No Test	
Jan. 12											13.2	
											8.6	
Jan. 13	20.8		Claystone		Tuffaceous and pumiceous partly interbedded fine sand well sorted, weakly cemented light olive brown to light olive gray						0.5	
	22.0										0.0	
	25.0		Claystone		Tuffaceous, compact, gray partly stained brown color							

HOLE NO. KB16

LOG FORM-B

*R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

* Source : Ref. 3 , modified by JICA team's expert.

DRILL LOG

HOLE NO. KB17 SHEET NO. 17 OF 19

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	40 m	ELEVATION	72.77 m
SITE	KARIAN DAMSITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	TONE
AVERAGE CORE RECOVERY		DATE	FROM Nov. 11 TO Nov. 15, 1984	DRILLED	DPMA	LOGGED	M.F

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	WATER PRESSURE TEST LUGEON VALUE
Nov. 11	1.4	71.37	Pumice tuff	[illegible] brown to gray	D		32.4
	2.6	70.17	claystone	Tuffaceous, hard [illegible] yellow brown			
	5 5.8	66.97	Sandstone	Tuffaceous, coarse grained contain lapilli and pumice. compact, partly fragile and porous, gray	CL		580
	8.0	64.77	claystone				
Nov. 12	10 10.9	61.87	Sandstone	Tuffaceous, rather soft contain pumice, intercalated sandy pumice tuff, gray			NO TEST
	13.8	58.97	Pumice tuff	Pumiceous, fine to coarse grained contain lapilli, porous, slightly weathered, gray	CM		10.8
Nov. 13	15 20 22	50.77	claystone	Slightly weathered, compact, dense, dark gray Tuffaceous, slightly weathered, partly fractured intercalated pumice tuff with charcoal fragment yellow brownish gray	CL CM	▽	237.6 231.9 151.3
Nov. 14	25 27.7	45.07	Sandstone	Tuffaceous slightly weathered, laminated, fine to coarse grained pumice rich in a lower gray to yellow brown	CL		NO TEST
	30.3	42.47	Pumice tuff	slightly weathered, rather soft, yellow brown to brown			89.6
Nov. 15	35 36.0	36.77	Alternation of claystone and pumice tuff	Tuffaceous, slightly weathered, soft, partly fractured with crack joint			148.1
	37.5	35.27	Sandstone	Tuffaceous, coarse grained contain lapilli, bedded [illegible]			54.1
	40	32.77	claystone	Tuffaceous, rather soft partly fractured, gray			

Bit diameter 76 mm φ

HOLE NO. KB17

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is L/min·m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

DRILL LOG

HOLE NO. KB18 SHEET NO. 18 OF [illegible]

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	40m	ELEVATION	56.58m
SITE	KARIAN DAM SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	TONE
AVERAGE CORE RECOVERY		DATE	FROM Nov. 17 TO Nov. 22, 1984	DRILLED	DPMA	LOGGED	M.F

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	DESCRIPTION	ROCK GRADE
Nov. 17	0.4	56.18	Topsoil	Brown soil	
	1.7	54.88	Residual Soil	Weathered pumice tuff, soft stiff, yellow brown	D
	9.3	47.28	Pumice Tuff	Slightly weathered, porous compact, partly fractured with crack joint, claystone intercalated from 7.8 to 8.4m, yellow-br. to brown	CM
Nov. 18	15.4	41.18	Conglomerate	Tuffaceous, slightly weathered, poor cemented, expanded grain size become brecciated, contain pumice, not compacted, gravel size 30~60mm, very poor RQD, gray	
Nov. 19	18.7	37.88	Claystone	Tuffaceous, slightly weathered, rather soft, fractured with clay seam joint, partly sandy, gray to reddish gray	
	20.4	36.18	Sandstone	Tuffaceous, slightly weathered, loose, fine to medium grained, gray	CL
	23.0	33.58	Pumice Tuff	Slightly to moderately weathered, rather soft, reddish gray	
	24.6	31.98	Sandstone	Tuffaceous, fine grained, contain some pumice, light olive brown	
Nov. 20, Nov. 21	35.4	21.18	Claystone	Tuffaceous, moderately to hard weathered, soft, fractured with clay seam, partly contain some pumice, intercalated sand thin layer, gray to yellow br.	
	36.6	19.98	Pumice tuff	Porous, welded tuff, gray	
Nov. 22	38.25	18.33	Alternation sand s. & clay	Tuffaceous, compact, gray	
	40	16.58	Claystone	Tuffaceous, fractured with weathered clay seam joint, lower part change to fine grained laminated sandstone	

Groundwater level: ▽ at approx. 18 m

WATER PRESSURE TEST — LUGEON VALUE

Lugeon value
122.5
95.3
83.9
NO TEST
9.2
7.2

Bit diameter 76mm φ

HOLE NO. KB18

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%

*LUGEON VALUE is 1 l/min/m under injection water pressure of 10kg/cm²

*DEPTH and ELEVATION are in meter

DRILL LOG

HOLE NO. KB 19 SHEET NO. 1 OF 2

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	40m	ELEVATION	27.8m
SITE	KARIAN DAM SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	TONE
AVERAGE CORE RECOVERY		DATE	FROM Nov 3 TO Nov 8 '84	DRILLED	DPMA	LOGGED	M.F

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY % / cm	R.Q.D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Nov. 3	2.2	26.6	soil		Brown, sticky, soft	D				No Test	
	3.0	19.8	clay		Tuffaceous, hard weathered claystone, yellow-brown		▽				
	5		claystone			CL				1.4×10^{-3}	
	6.0	16.8			Tuffaceous, moderately weathered, interbedded coarse grained sandstone grayish brown						
Nov. 4			welded tuff		Compact, partly slightly weathered fractured, contain pumice, gray to brown	CM				11.3	
	10										
	11.6	11.2									
			Sandstone		Tuffaceous, fine to medium grained, porous well bedded contain pumice, moderately weathered pumiceous fractured layer intercalated, gray to brown	CL				30.3	
	15.2	7.6									
			Siltstone							56.7	
	18.3	4.5			Tuffaceous, upper part crushed into fragment lower part dense compact, contain pumice gray	CM					
Nov. 5	20		pumice tuff							55.2	
	21.2	1.6			rich joint with clay seam, soft, lightweight dark gray						
	23		alternation of claystone and sandstone		Claystone: Tuffaceous compact, dense, partly fractured, gray Sandstone: Tuffaceous fine to coarse grained well bedded, contain weathered pumice, gray	CL				413.6	
Nov. 6	29.2	-6.4								71.2	
	30		conglomerate		Tuffaceous, pumiceous porous, poor cemented rather soft gray						
	31.5	-8.7									
	32.9	-11.0	claystone		Tuffaceous, fractured soft, gray					13.9	
Nov. 7	35.3	-12.5	Siltstone		Tuffaceous, soft moderate weathered olive gray						
			claystone							15.8	
Nov. 8	40	-17.2			Tuffaceous, compact contain pumice fractured with slickenside at 35.3 – 38.0m dark gray						

Bit diameter 76mm φ

HOLE NO. KB 19

LOG FORM-B

※R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is 1 min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

DRILL LOG

HOLE NO. KB20 SHEET NO. 20 OF 23

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	40m	ELEVATION	29.24 m
SITE	KARIAN DAM SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	TONE
AVERAGE CORE RECOVERY		DATE	FROM Oct. 26 TO Nov. 1 '84	DRILLED	DPMA	LOGGED	M. F.

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
Oct. 26	1.2	≅8.04	Top Soil		Brown, Soft							
	3.5	≅5.74	claystone		Tuffaceous, yellowish gray, moderate weathered	D					No Test	
Oct. 27	5		sandstone		Tuffaceous, fine to medium grained, compact partly porous with pumice, interbedded compact tuffaceous clay		▽				K=4.6×10⁻³ cm/sec	
	6.0	23.24	claystone								77.2	
	9.0	20.24			Tuffaceous, compact, rather soft, tight joint olive brown to gray							
	10		pumice tuff								60.3	
	12.0	17.24			Moderate, weathered soft, porous, light weight, dusky yellow	CL						
Oct. 28	15		sandstone								21.5	
	16.1	13.14			Tuffaceous, fine to medium grained, loose, rich joint, downward grain size become coarse dark gray							
	19.8	9.44	welded tuff								51.0	
Oct. 29			alternation of sandstone and claystone		Interbedded weathered pumice, fine grained gray							
	25	4.24									115.9	
Oct. 30	27.0	2.24	Sandstone		Sandstone: fine to coarse grained contain quartz and pumice partly fractured, gray	CM						
	30		Sandstone		Claystone: Tuffaceous contain pumice rather fragile, gray	CL					93.1	
	31.6	-2.36										
	33.0	-3.76	claystone		Tuffaceous, very fine to fine grained upward grain size become very fine, well sorted, dense, white							
Nov. 1	35		pumice tuff			CM					18.8	
	37.5	-8.26			Tuffaceous, Pumiceous fine to medium grained porous, laminated interbedded claystone partly weathered fractured yellowish gray to gray	CL					27.3	
	38.0	-8.76	claystone									
	40	-10.76	Sandstone		Tuffaceous, fragmental gray							
					Fine to medium grained solid, slightly weathered contain some lapilli, matrix sandy tuff. gray							
					Tuffaceous, rather soft, gray							
			Bit Diameter	76 mm φ	Tuffaceous, fine to coarse grained, contain pumice, well bedded fractured in lower portion, poor cemented, dark gray							

HOLE NO. KB20

LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%

*LUGEON VALUE is Lugeon under injection water pressure of 10kg/cm²

*DEPTH and ELEVATION are in meter

DRILL LOG

HOLE NO. KB21 SHEET NO. 21 OF ?

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	40m	ELEVATION 62.85m
SITE	KARIAN DAM SITE	COORDINATE : :	INCLINATION	90°	DRILL RIG TONE
AVERAGE CORE RECOVERY		DATE FROM oct 18 TO oct 24 '84	DRILLED	DPMA	LOGGED M.F

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	CORE RECOVERY % / cm	R.Q.D %	WATER PRESSURE TEST LUGEON VALUE	DEPTH
	0.0	62.85	TOP SOIL		Dark brown cohesive						
	1.5	61.35	Silt		Tuffaceous, weathered	D				1.7×10^{-4}	
Oct. 18	3.0	59.85	Siltstone		siltstone, soft light gray					4.7×10^{-5}	
	4.2	58.65	Sandstone								
	5				Pumiceous, hard weathered, fragmental light gray						
			Sandstone							0.9	
	9.3	53.55			Tuffaceous, medium to coarse grained, well sorted, compact yellowish brown	CL					
Oct. 19			Sandstone and conglomerate							3.3	
	15				Tuffaceous, very fine to fine grained, well sorted, partly contain fragments of breccia						
	16.0	46.85								No Test	
					Tuffaceous, medium to coarse grained, contain quartz, semi angular gravel, and volcanic sand, poor cemented gray						
Oct. 20	20		claystone							5.0	
	23.0	39.85									
	25				Tuffaceous, silty well sorted, intercalated weathered pumice layer light weight whitish gray, compact	CM	▽			0.7	
Oct. 21			Sandstone							8.1	
	30.1	32.75			Tuffaceous, fine to coarse grained, contain quartz and pumice, intercalated porous conglomerate, compact	CL					
Oct. 22	32.45	30.40	claystone			CM				2.8	
	35				rather soft, gray						
Oct. 23			Sandstone								
	37.2	25.65			Tuffaceous, compact stiff, light brown	CL				No Test	
			welded tuff								
	40	22.85			Tuffaceous fine to coarse grained, well cemented, sorted, some intercalated gravel of volcanic igneous rock dark olive gray						
					Pumiceous, rich crack sandy tuff matrix fractured at lower portion yellow gray						
					Bit diameter 76 mm φ						

HOLE NO. KB21

LOG FORM—B

※R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm) / (Total core length) × 100%

※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²

※DEPTH and ELEVATION are in meter

DRILL LOG

HOLE NO. KB22 SHEET NO. 22 OF 22

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION			DEPTH	20m	ELEVATION	46.49m
SITE	KARIAN DAM SITE	COORDINATE	: :	INCLINATION	90°	DRILL RIG	Tone
AVERAGE CORE RECOVERY		DATE	FROM Nov. 29 TO Dec. 2, 1984	DRILLED	DPMA	LOGGED	M.F

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	LUGEON VALUE
Nov. 29	3.0	43.49	Top soil	Residual soil. Compact, brown.	D		0.7
Dec. 1	12.0	34.49	Pumice tuff	Compact, well bedded, light weight, partly contain lapilli and poor cemented. Slicken side crack water (at 6-7m), Stained iron brown color (7-7.5m), White gray. Lower portion rather weathered and soft.	CL		10.7 / 3.4
Dec. 2	15	31.49	Conglomerate	Tuffaceous, rounded to sub-rounded, weakly cemented, fragment consists of fixed volcanic rocks and chart diameter 5~10 cmφ	CM	▽	NO TEST
	20	26.49	Sandstone	Tuffaceous, medium to coarse grained, laminated. Contain pumice, gray, stained brown color (17.?-20m). Slightly weathered	CL		40.8

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is l/min·m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

LOG FORM-B

HOLE NO. KB22

DRILL LOG

HOLE NO. KB23 SHEET NO. 23 OF [illegible]

PROJECT	KARIAN MULTIPURPOSE DAM CONSTRUCTION		DEPTH	20 m	ELEVATION	30.12 m
SITE	KARIAN DAM SITE	COORDINATE : :	INCLINATION	30°	DRILL RIG	
AVERAGE CORE RECOVERY		DATE FROM Nov. 25 TO Nov. 28. 1984	DRILLED	DPMA	LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	ROCK GRADE	GROUNDWATER LEVEL	WATER PRESSURE TEST LUGEON VALUE
Nov. 25	2.0	28.12	Top soil		Residual Soil compact brown	D		181.8
Nov. 26	5 / 6.0	24.12	Pumice tuff		Hard weathered, contain lapilli, light weight dusky yellow,			194.3
Nov. 26	9.3	20.82	claystone intercalated Sandstone		Tuffaceous, weathered, contain pumice partly fractured, olive brown		▽	1.2
27/11	12.6	17.52	Conglomerate		Tuffaceous, rounded to sub rounded, weakly cemented contain sand, fragment consist of volcanic rock	C[L]		5.7
Nov. 28	15 / 16.8	13.32	Sandstone		Tuffaceous, medium to coarse grained, laminated contain pumice, gray to brown moderately weathered			20.7
	20	10.12	claystone		Tuffaceous compact, slightly weathered, partly contain pumice (1.0 – [illegible] m), lower portion of pumice tuff, brown			

*R.Q.D is Rock Quality Designation. R.Q.D = (Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is 1 min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

LOG FORM-B

HOLE NO. KB 23