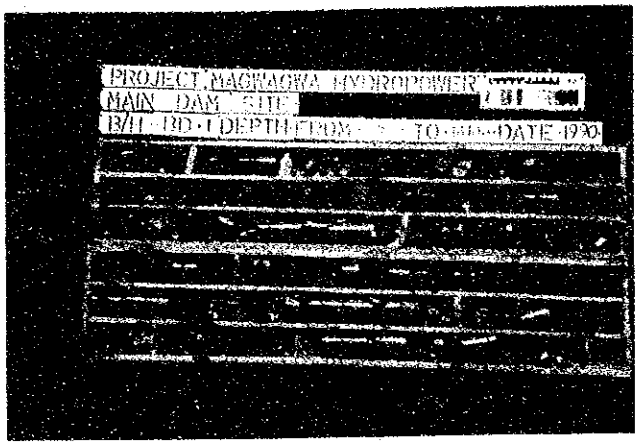
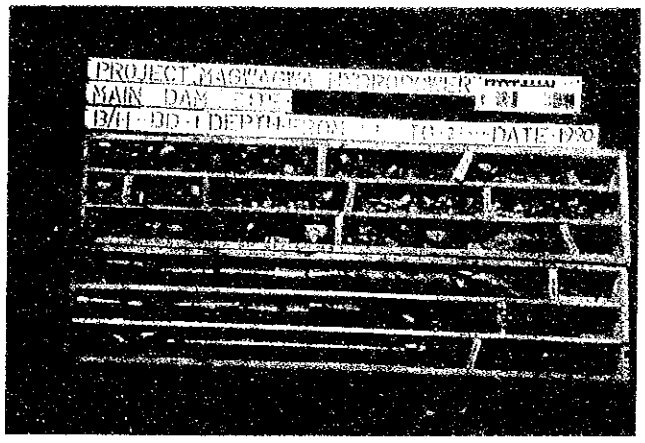
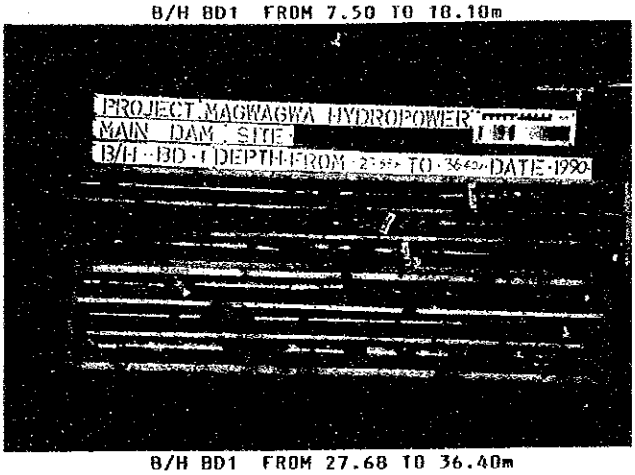
II.3 Photo of Drilled Core



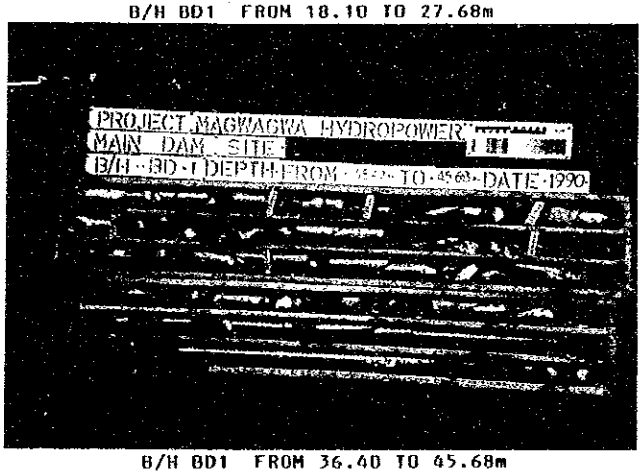
B/H BD1 FROM 7.50 TO 18.10m



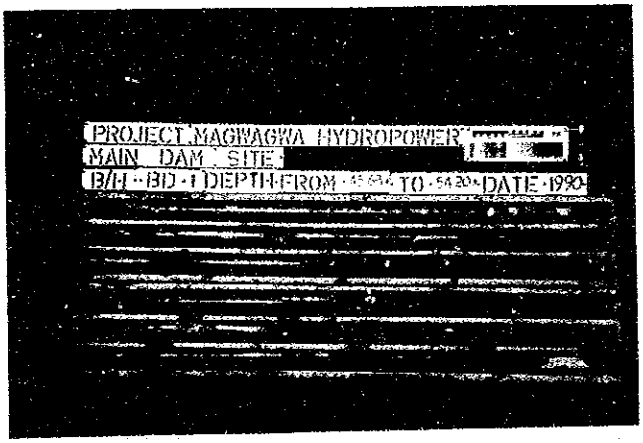
B/H BD1 FROM 18.10 TO 27.68m



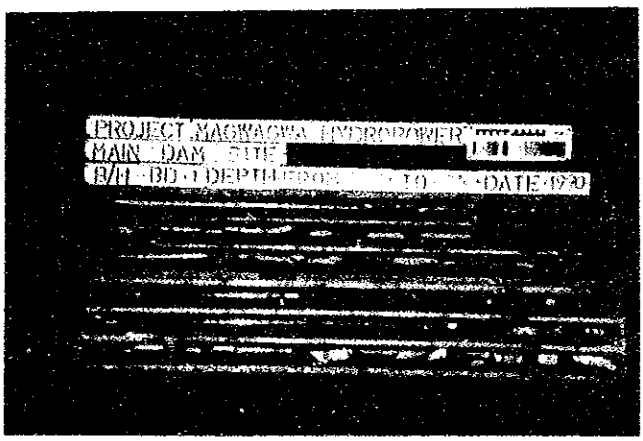
B/H BD1 FROM 27.68 TO 36.40m



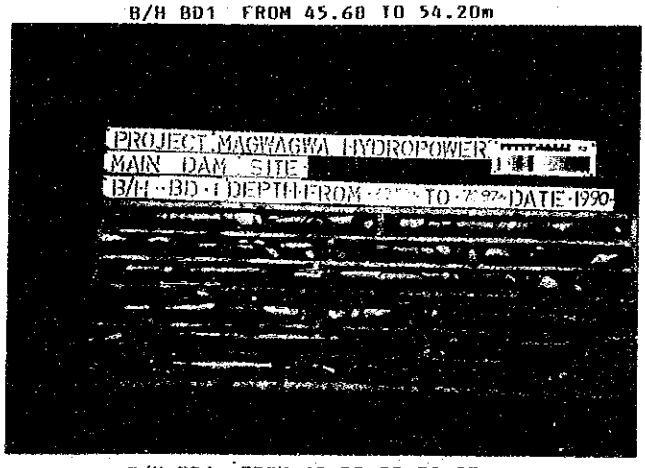
B/H BD1 FROM 36.40 TO 45.68m



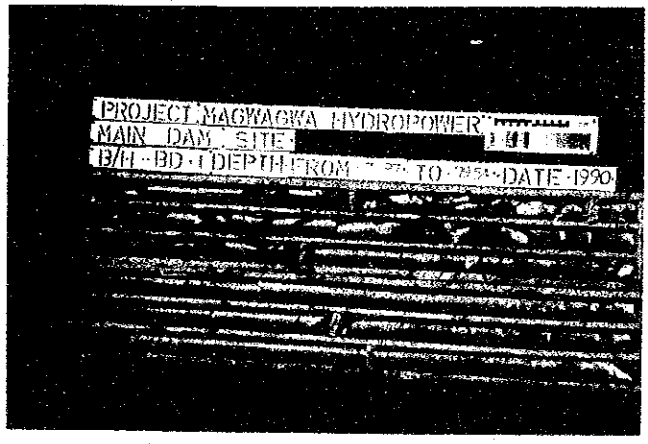
B/H BD1 FROM 45.68 TO 54.20m



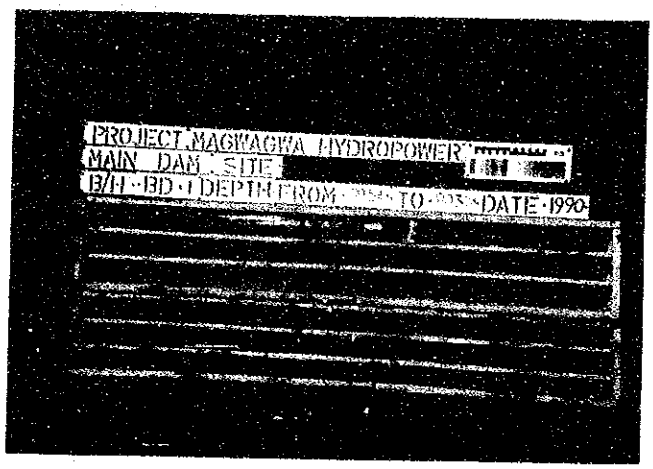
B/H BD1 FROM 54.20 TO 62.50m



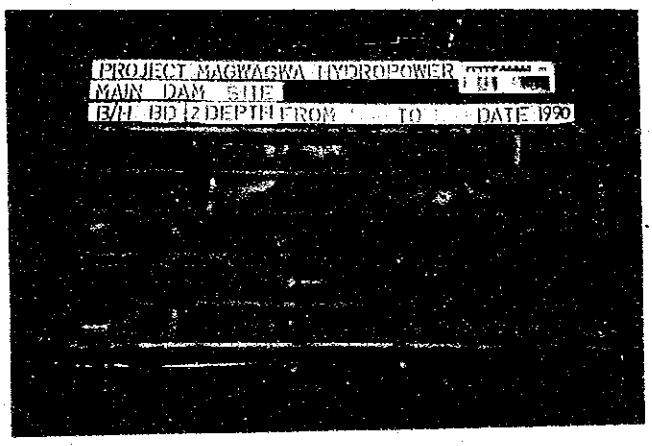
B/H BD1 FROM 62.50 TO 70.97m



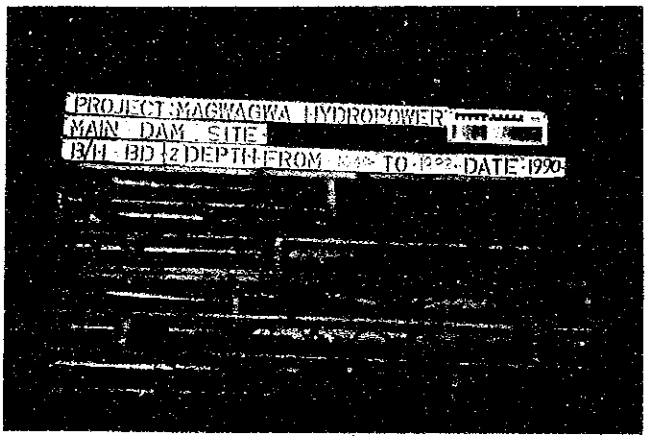
B/H BD1 FROM 70.97 TO 79.54m



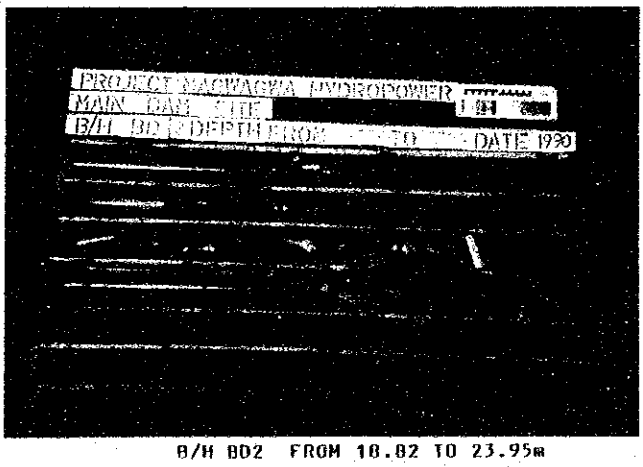
B/H. BD1 FROM 79.54 TO 80.30m (END OF B/H)



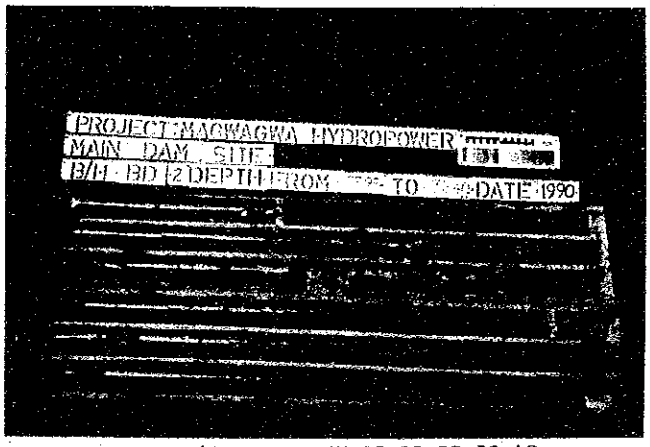
B/H BD2 FROM 1.50 TO 10.40m



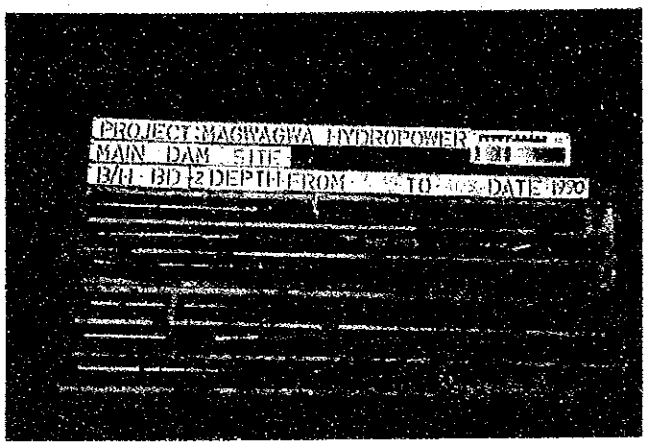
B/H BD2 FROM 10.40 TO 18.82m



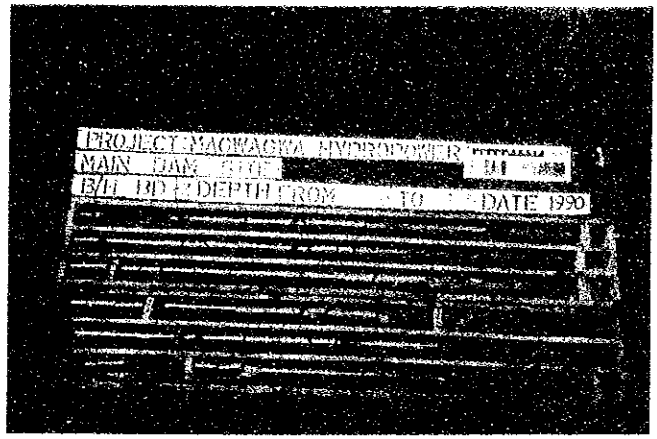
B/H BD2 FROM 18.82 TO 23.95m



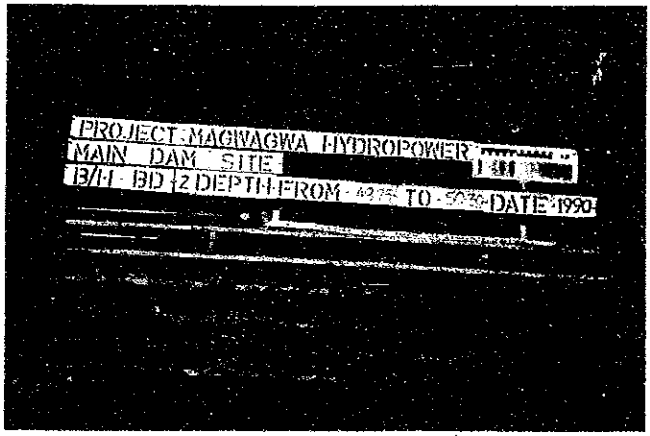
B/H BD2 FROM 23.95 TO 32.40m



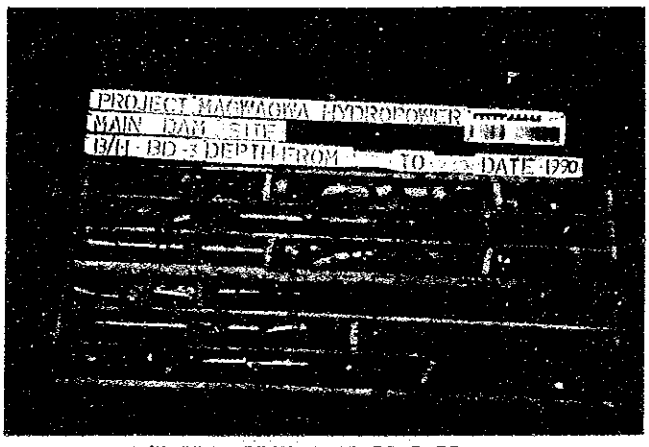
B/H BD2 FROM 32.40 TO 40.30m



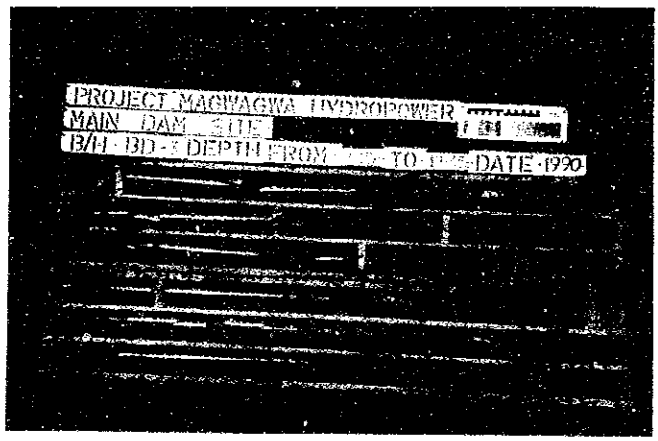
B/H BD2 FROM 40.30 TO 48.75m



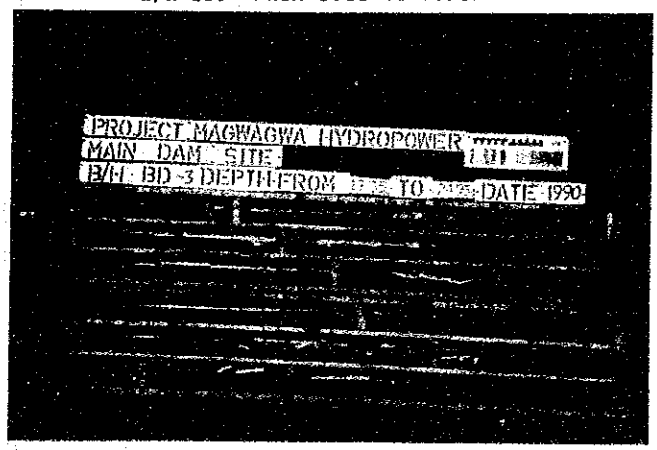
B/H BD2 FROM 48.75 TO 50.30m (END OF B/H)



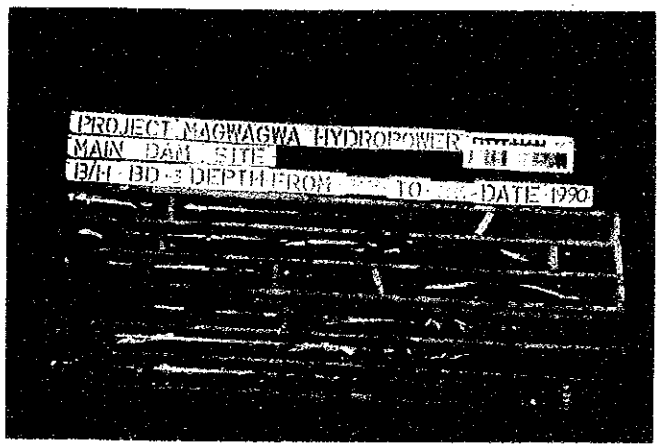
B/H BD3 FROM 0.00 TO 9.30m



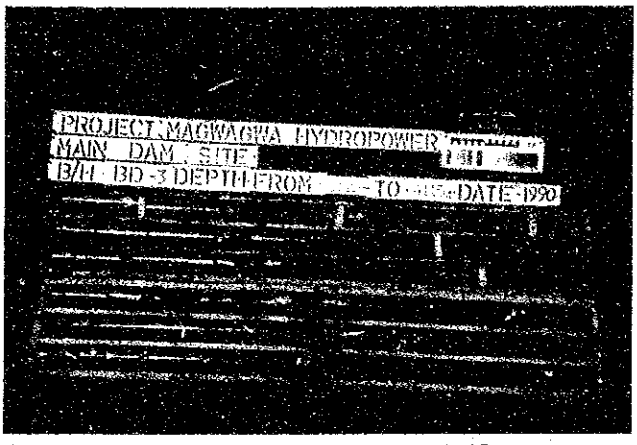
B/H BD3 FROM 9.30 TO 17.35m



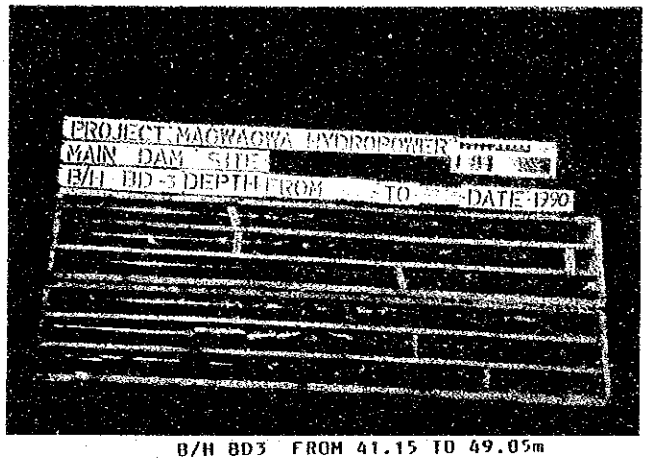
B/H BD3 FROM 17.35 TO 24.95m



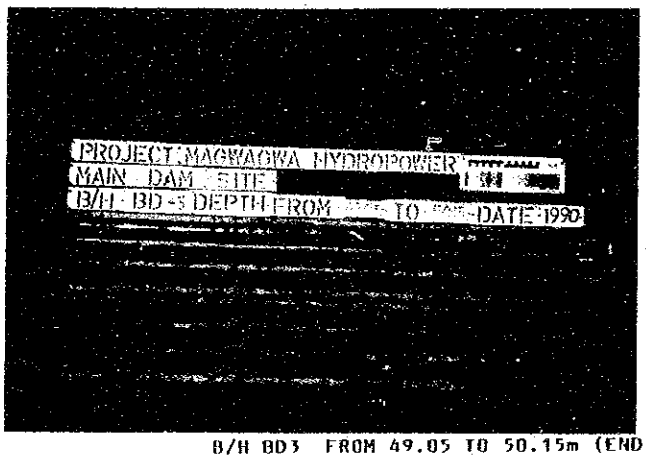
B/H BD3 FROM 24.95 TO 33.15m



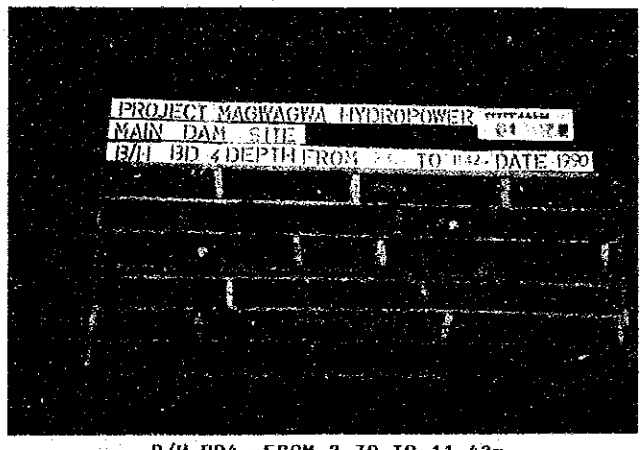
B/H BD3 FROM 33.15 TO 41.15m



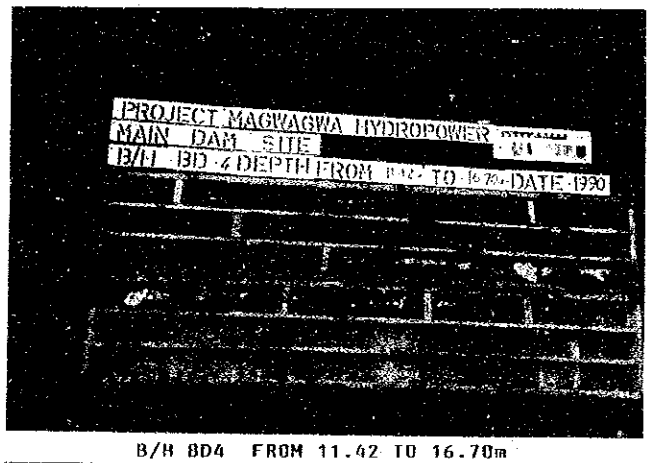
B/H BD3 FROM 41.15 TO 49.05m



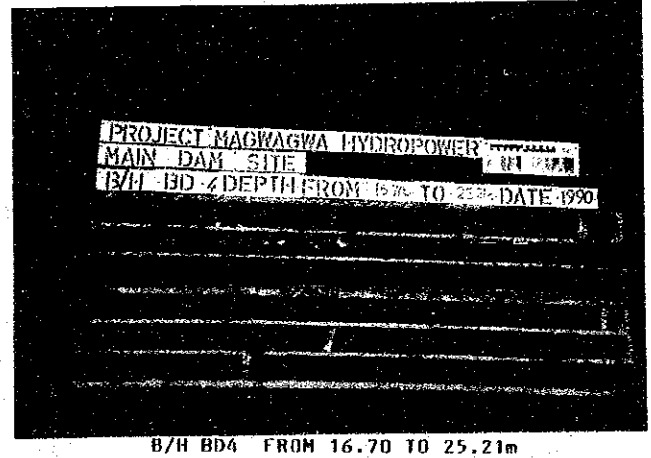
B/H BD3 FROM 49.05 TO 50.15m (END OF B/H)



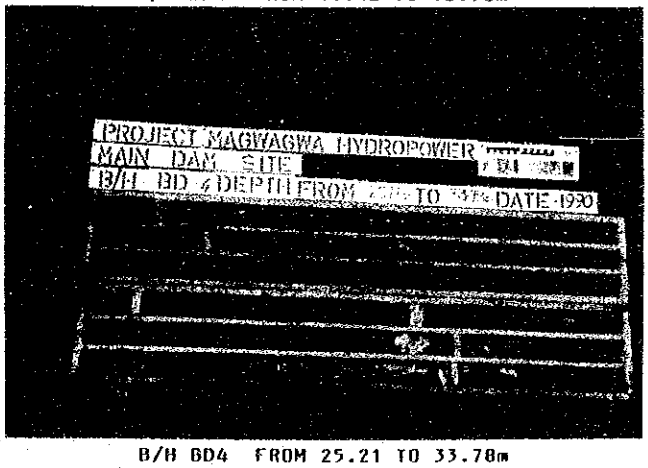
B/H BD4 FROM 2.30 TO 11.42m



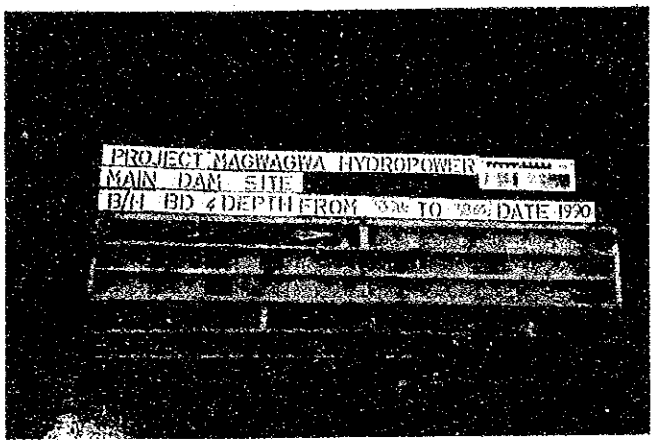
B/H BD4 FROM 11.42 TO 16.70m



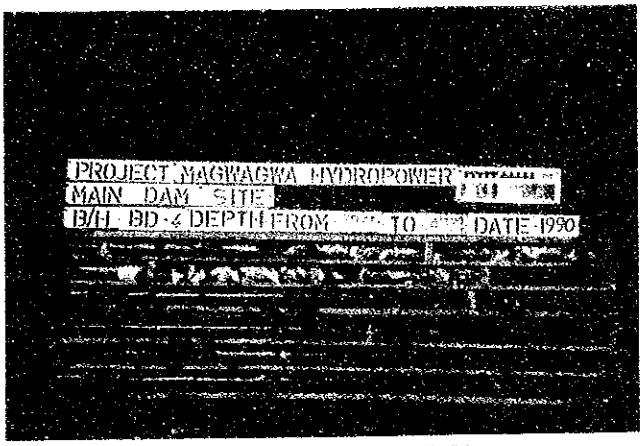
B/H BD4 FROM 16.70 TO 25.21m



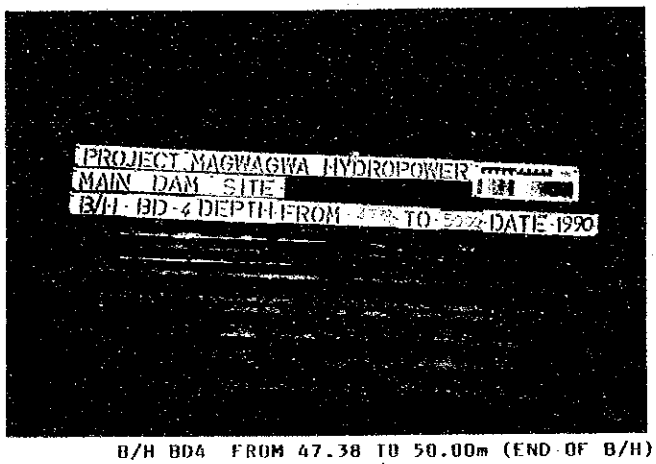
B/H BD4 FROM 25.21 TO 33.78m



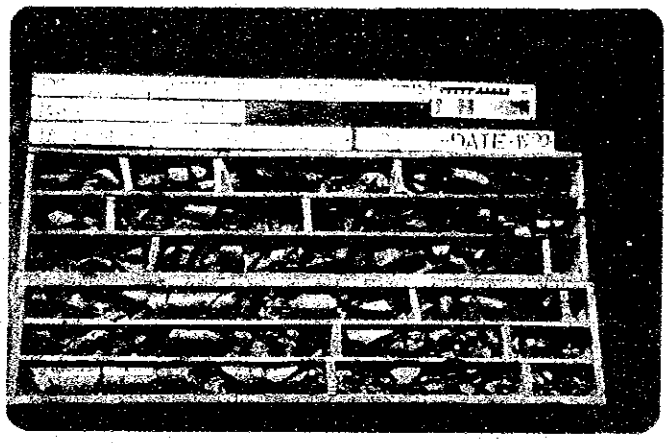
B/H BD4 FROM 33.78 TO 38.65m



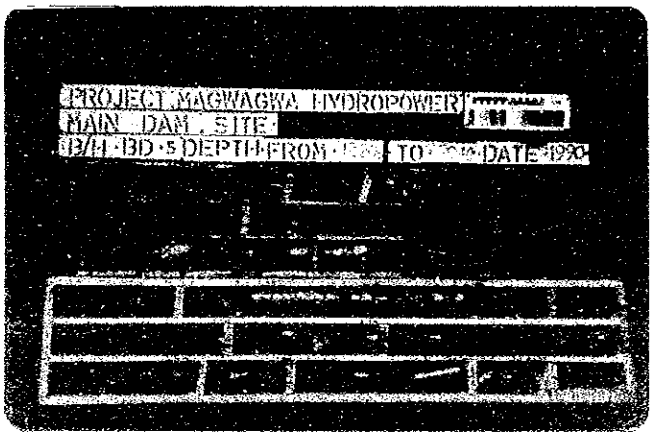
B/H BD4 FROM 38.65 TO 47.38m



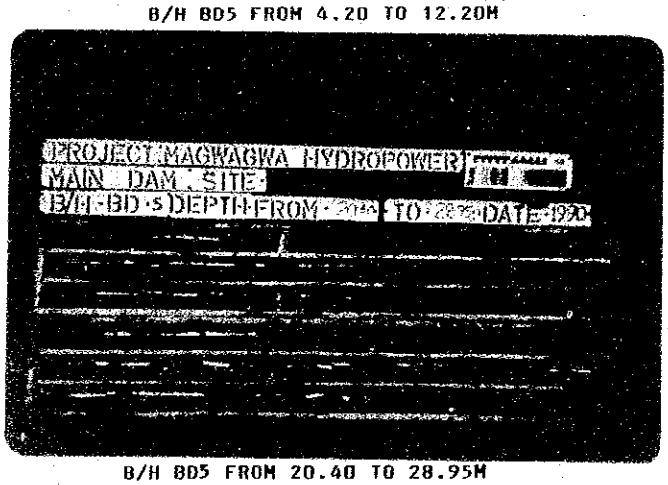
B/H BD4 FROM 47.38 TO 50.00m (END OF B/H)



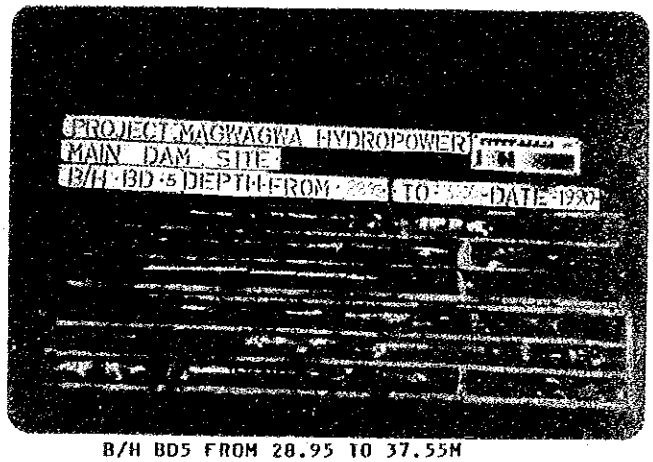
B/H BD5 FROM 4.20 TO 12.20M



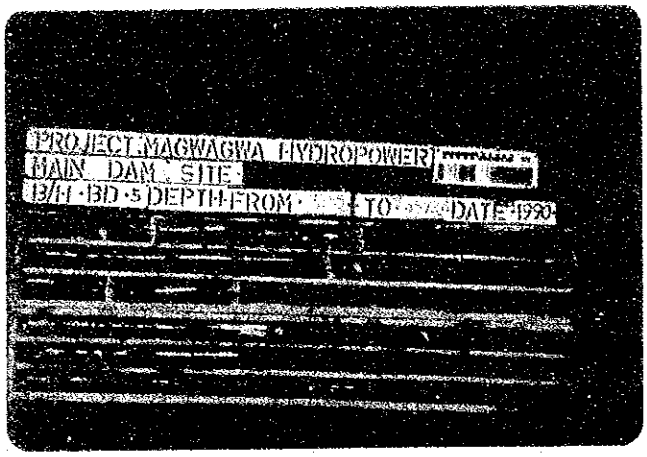
B/H BD5 FROM 12.20 TO 20.40M



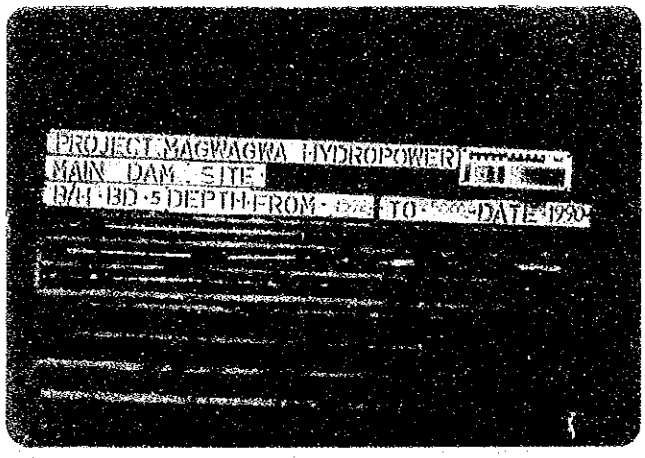
B/H BD5 FROM 20.40 TO 28.95M



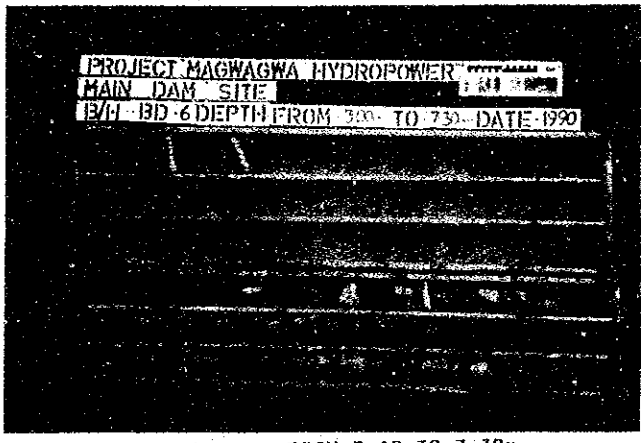
B/H BD5 FROM 28.95 TO 37.55M



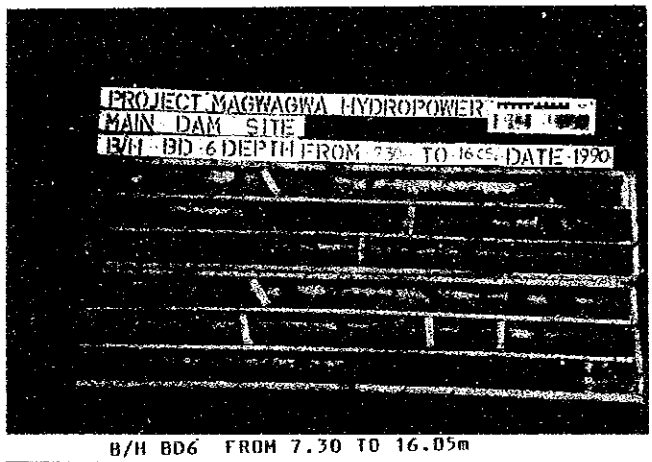
B/H BD5 FROM 37.55 TO 45.72M



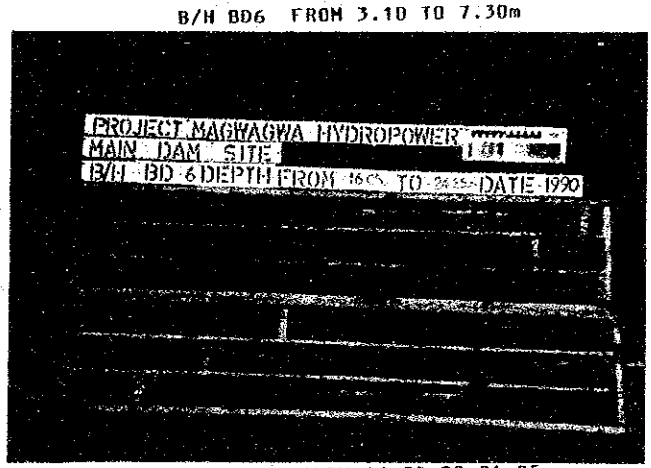
B/H BD5 FROM 45.72 TO 50.00M (END OF B/H)



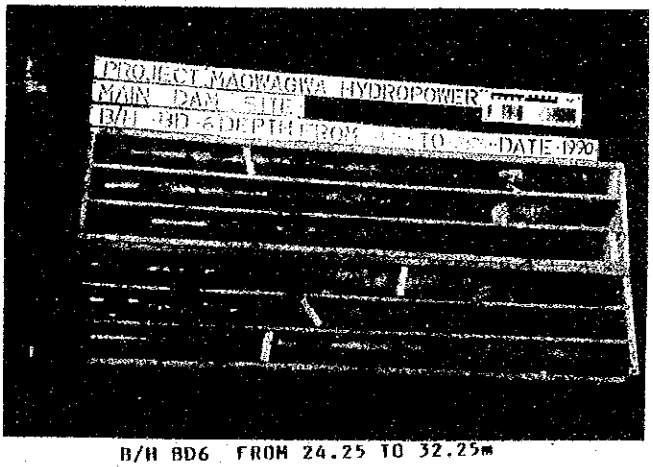
B/H BD6 FROM 3.10 TO 7.30m



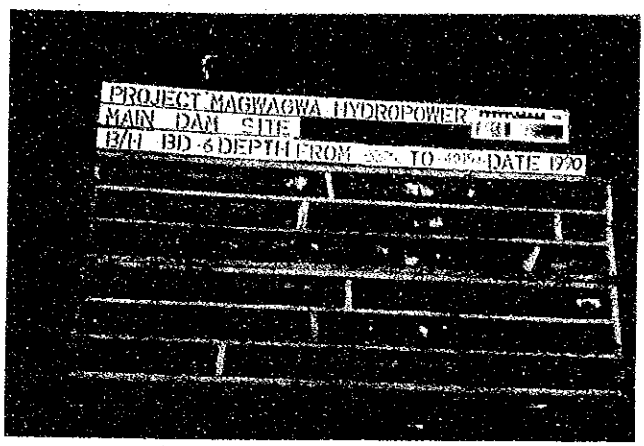
B/H BD6 FROM 7.30 TO 16.05m



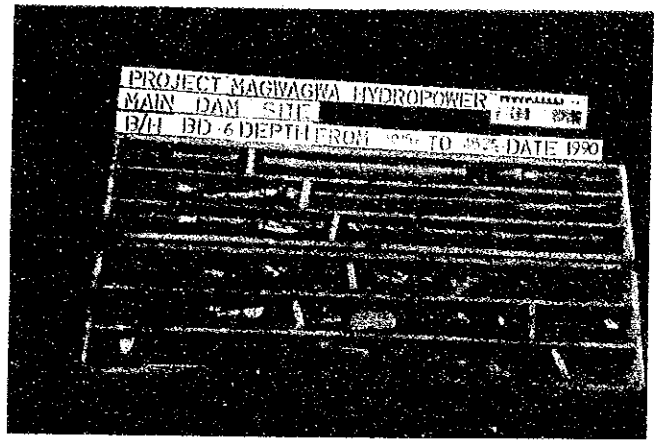
B/H BD6 FROM 16.05 TO 24.25m



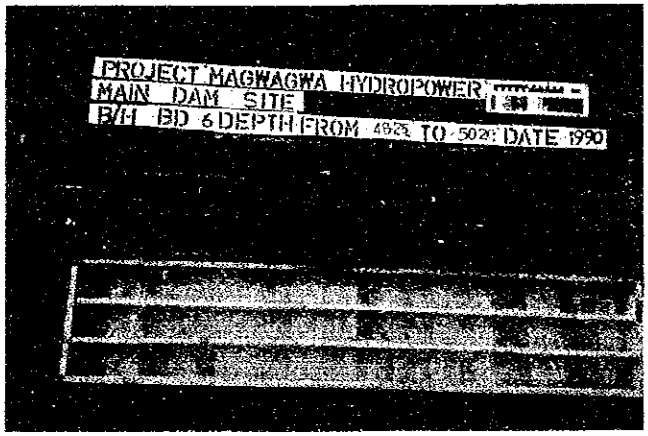
B/H BD6 FROM 24.25 TO 32.25m



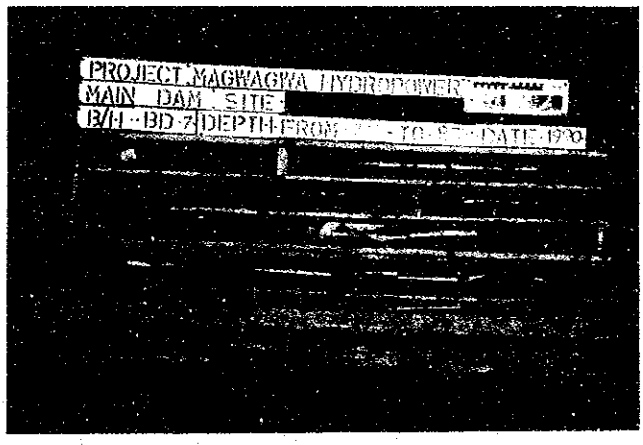
B/H BD6 FROM 32.25 TO 40.15m



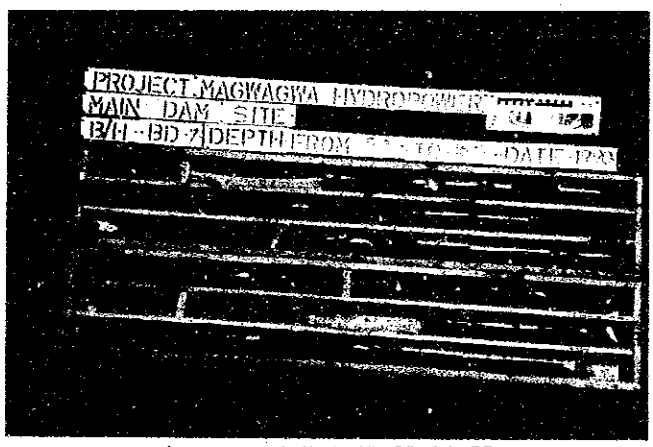
B/H BD6 FROM 40.15 TO 48.25m



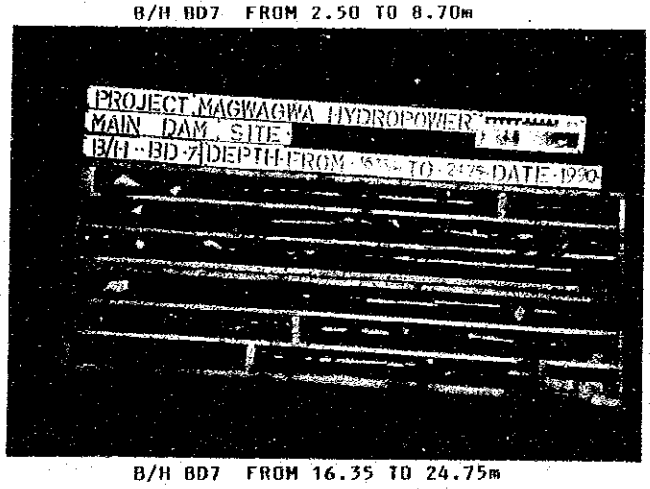
B/H BD6 FROM 48.25 TO 50.20m (END OF B/H)



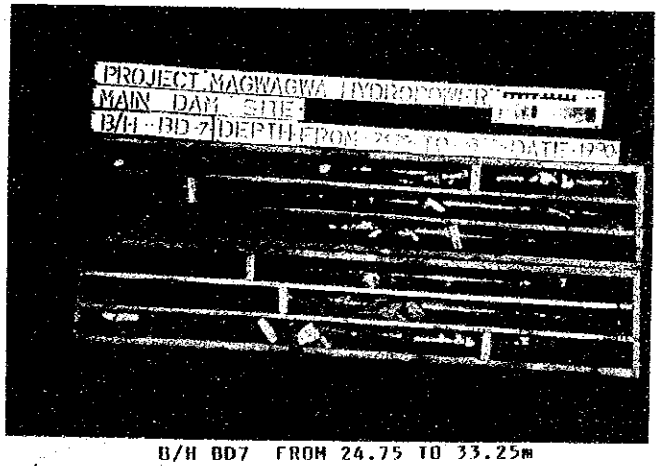
B/H BD7 FROM 2.50 TO 8.70m



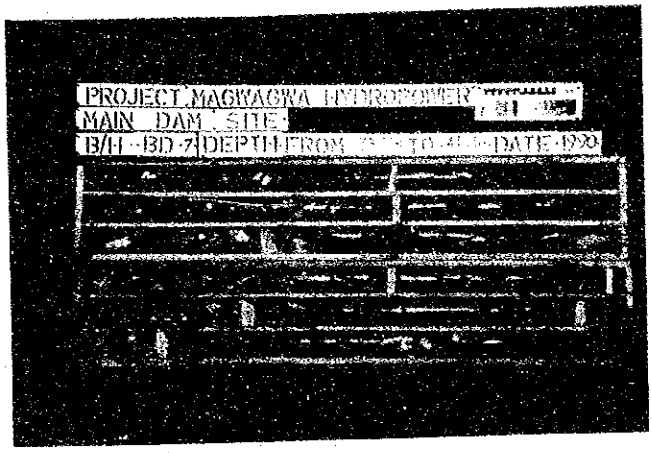
B/H BD7 FROM 8.70 TO 16.35m



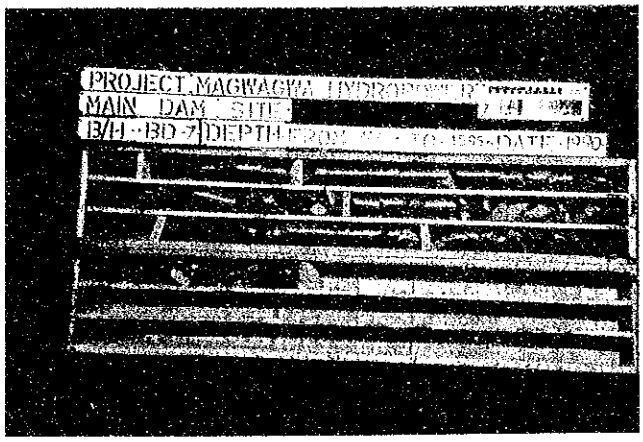
B/H BD7 FROM 16.35 TO 24.75m



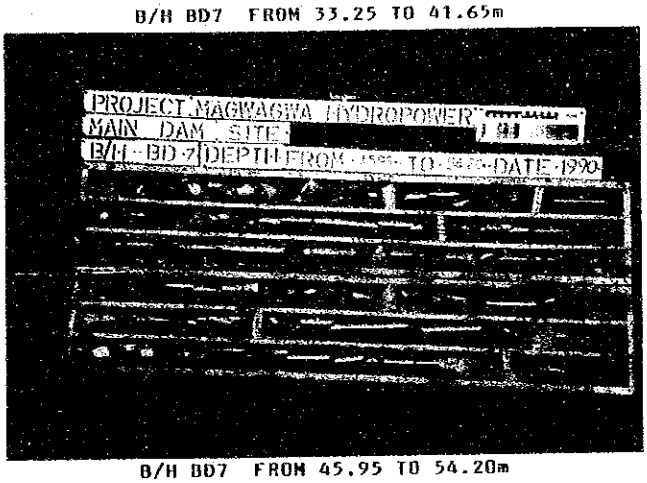
B/H BD7 FROM 24.75 TO 33.25m



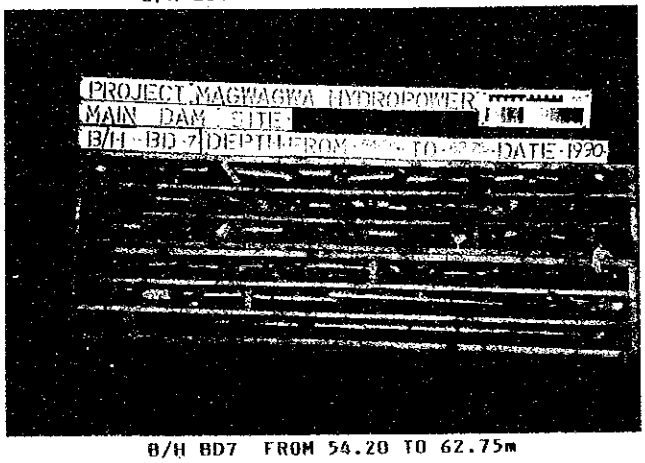
B/H BD7 FROM 33.25 TO 41.65m



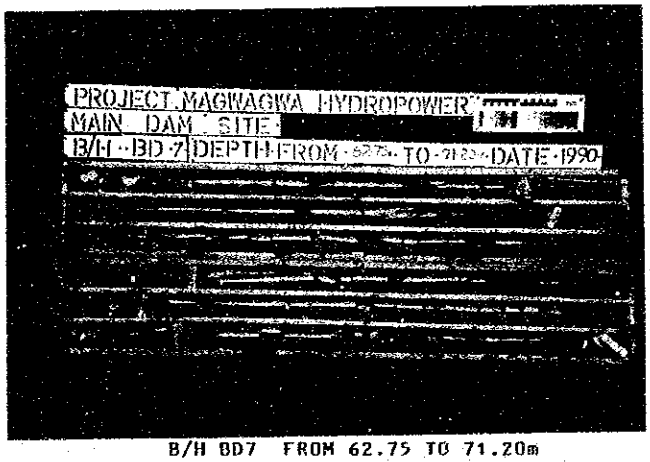
B/H BD7 FROM 41.65 TO 45.95m



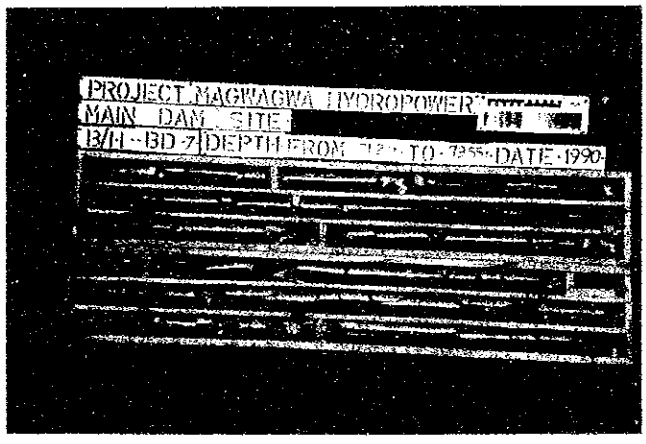
B/H BD7 FROM 45.95 TO 54.20m



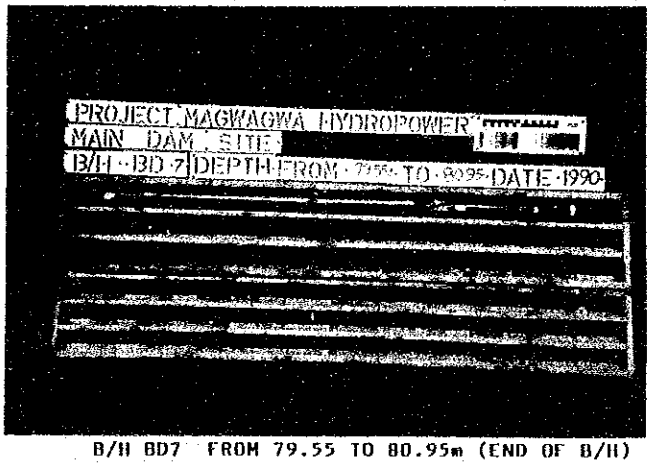
B/H BD7 FROM 54.20 TO 62.75m



B/H BD7 FROM 62.75 TO 71.20m

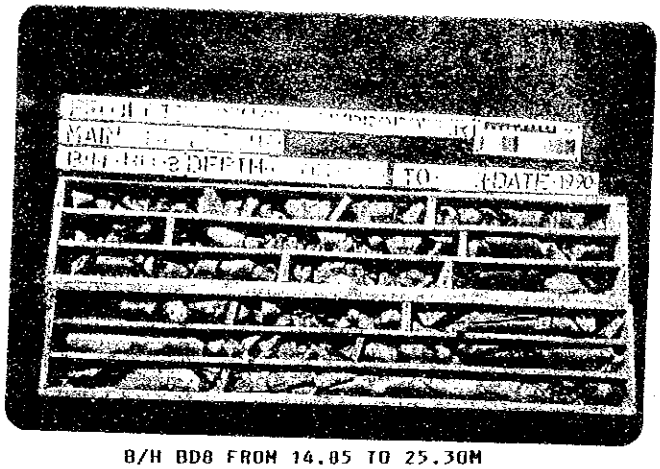


B/H BD7 FROM 71.20 TO 79.55m

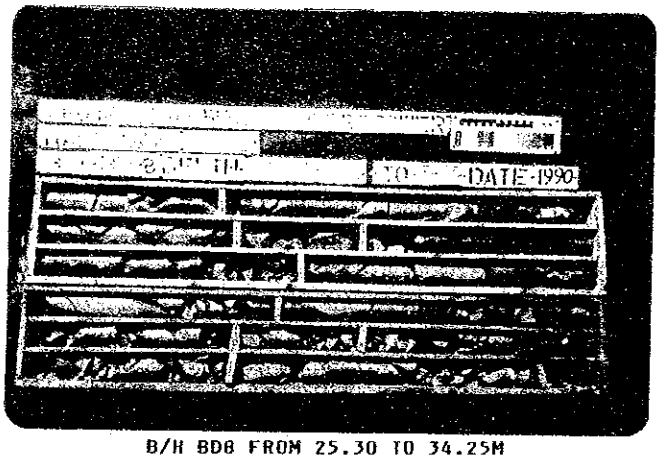


B/H BD7 FROM 79.55 TO 80.95m (END OF B/H)

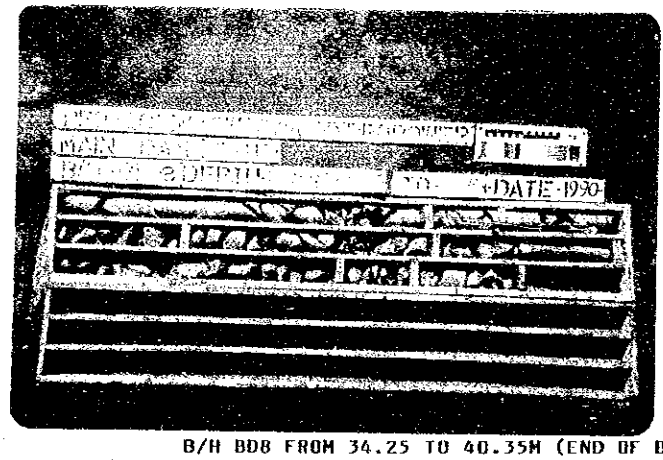
B/H BD8 FROM 2.00 TO 14.85M



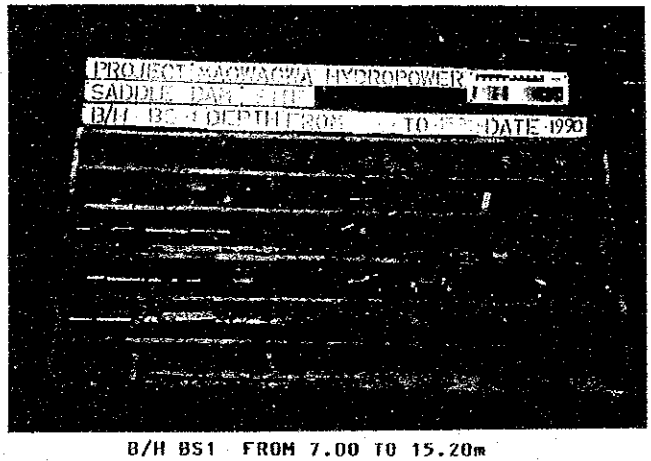
B/H BD8 FROM 14.85 TO 25.30M



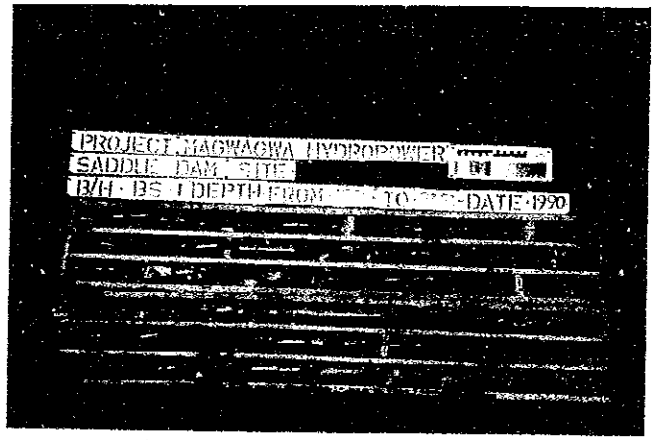
B/H BD8 FROM 25.30 TO 34.25M



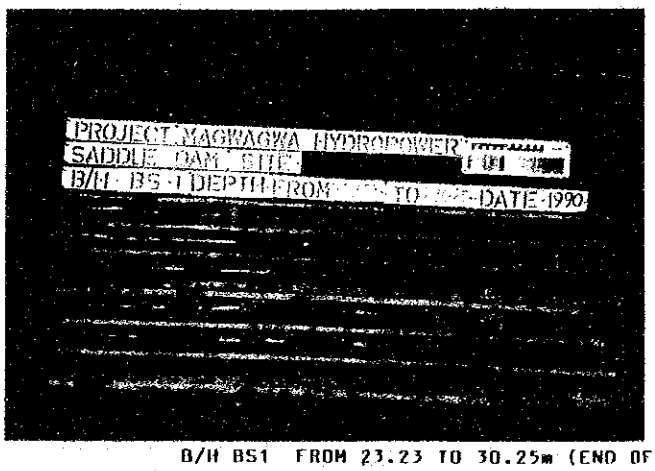
B/H BD8 FROM 34.25 TO 40.35M (END OF B/H



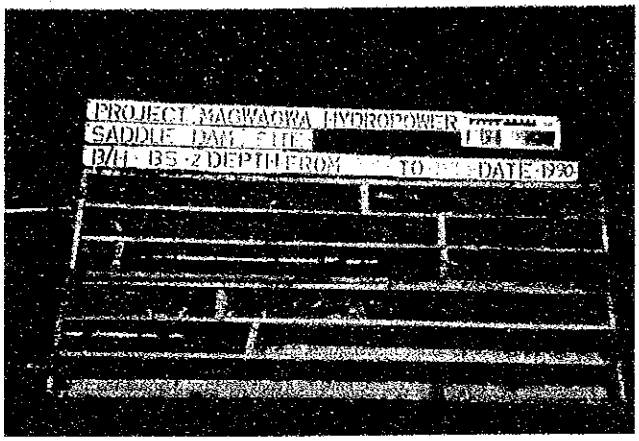
B/H BS1 FROM 7.00 TO 15.20m



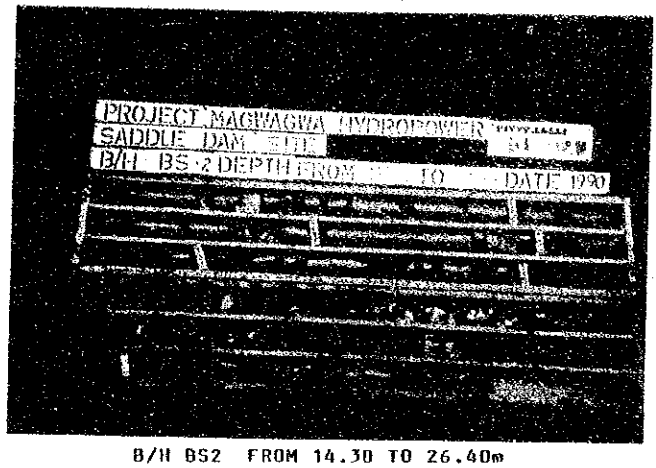
B/H BS1 FROM 15.20 TO 23.23m



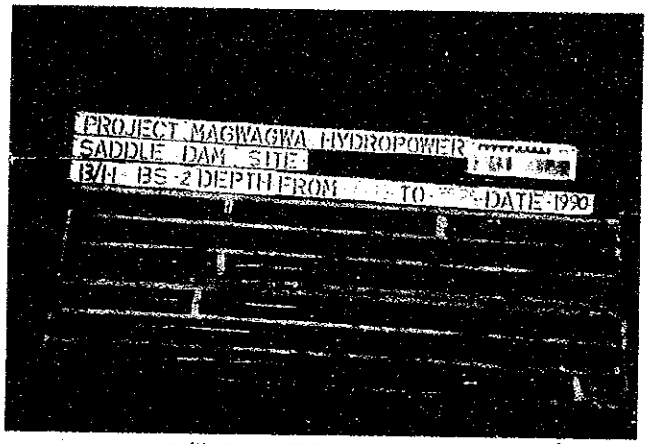
B/H BS1 FROM 23.23 TO 30.25m (END OF B/H)



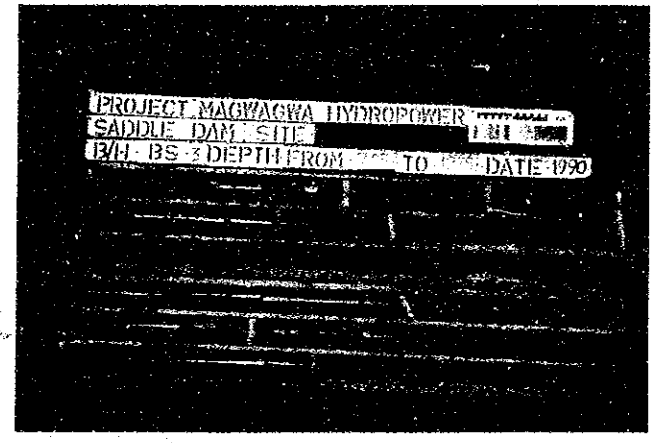
B/H BS2 FROM 8.25 TO 14.30m



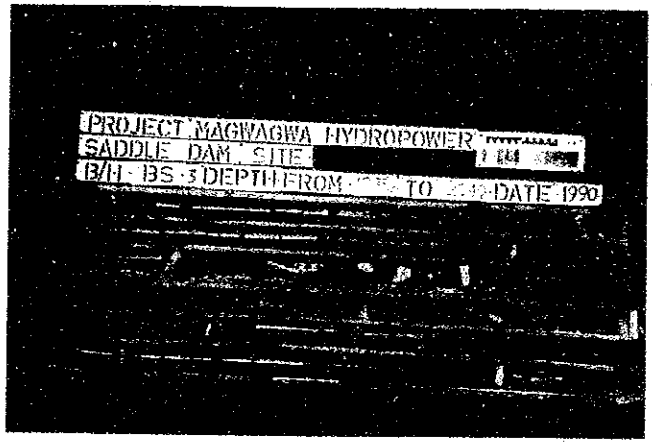
B/H BS2 FROM 14.30 TO 26.40m



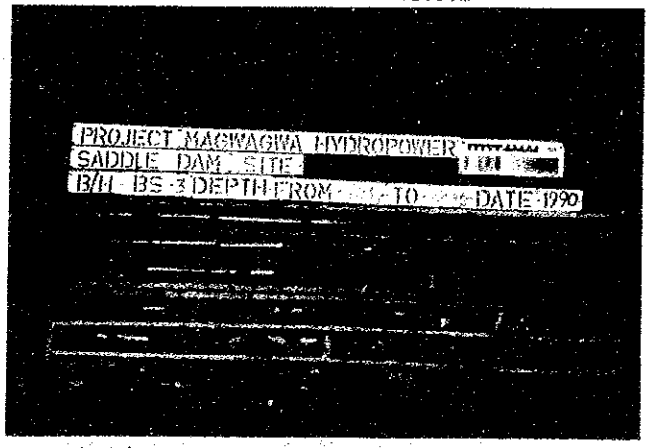
B/H BS2 FROM 26.40 TO 35.25m (END OF B/H)



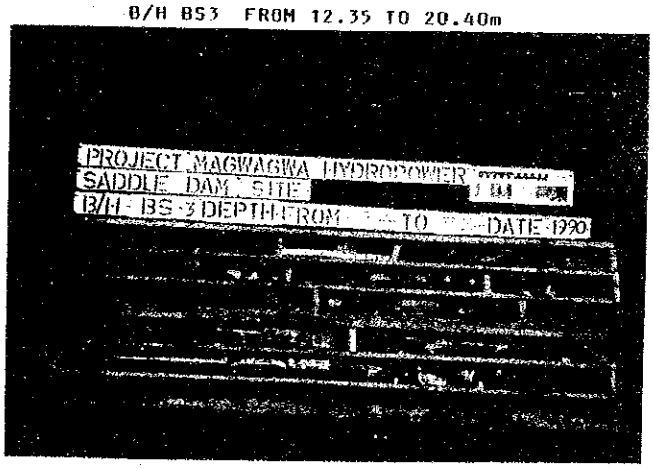
B/H BS3 FROM 7.05 TO 12.35m



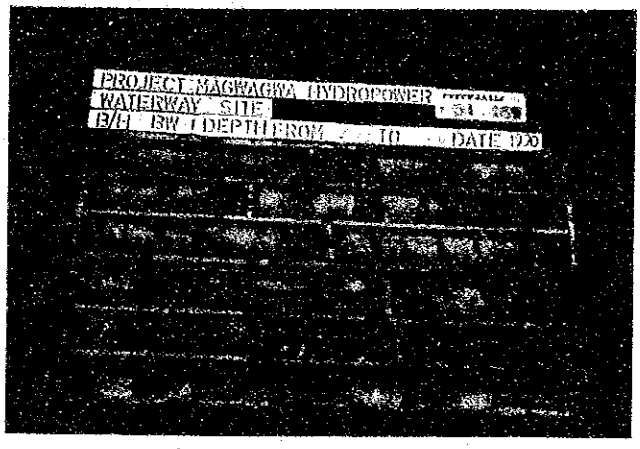
B/H BS3 FROM 12.35 TO 20.40m



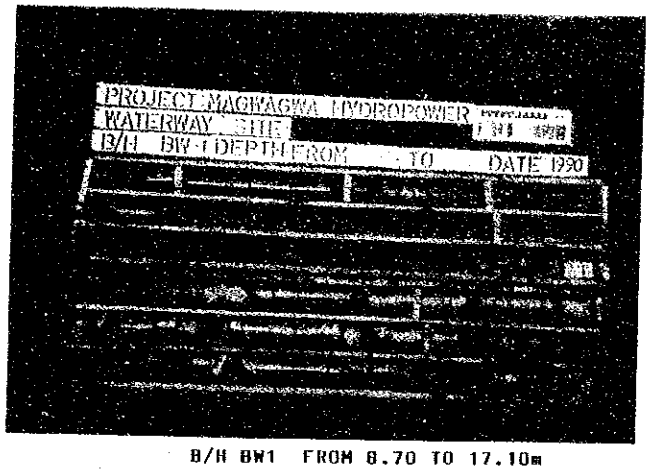
B/H BS3 FROM 20.40 TO 28.46m



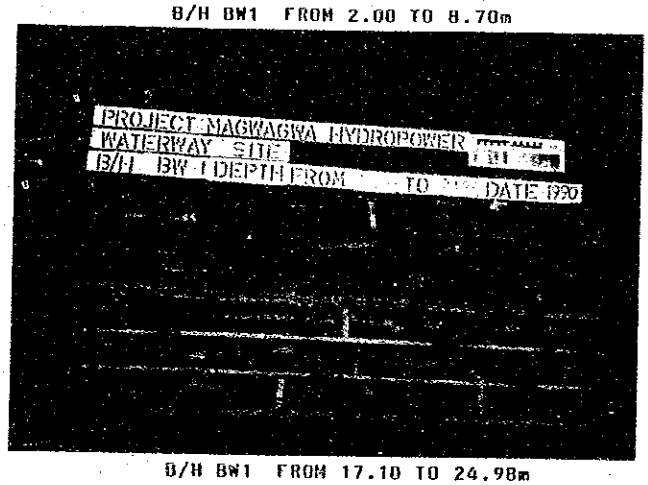
B/H BS3 FROM 28.46 TO 35.10m(END OF B/H)



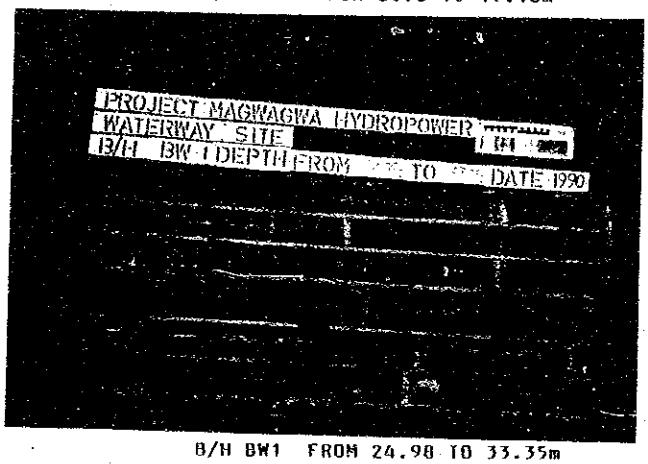
B/H BW1 FROM 2.00 TO 8.70m



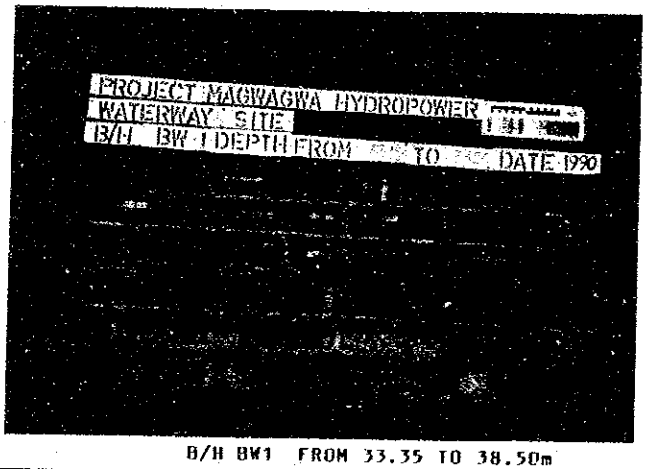
B/H BW1 FROM 8.70 TO 17.10m



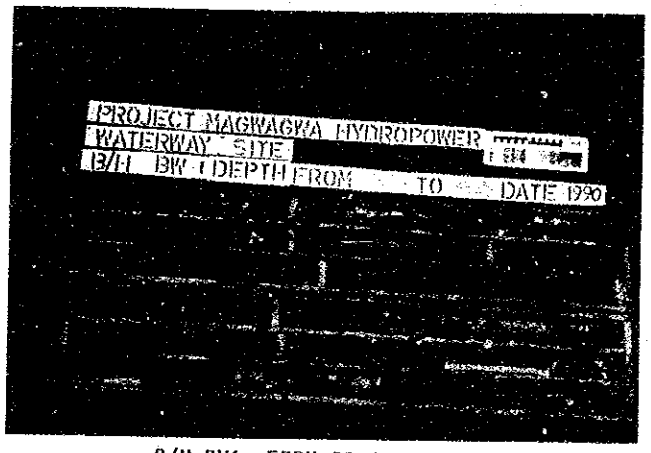
B/H BW1 FROM 17.10 TO 24.98m



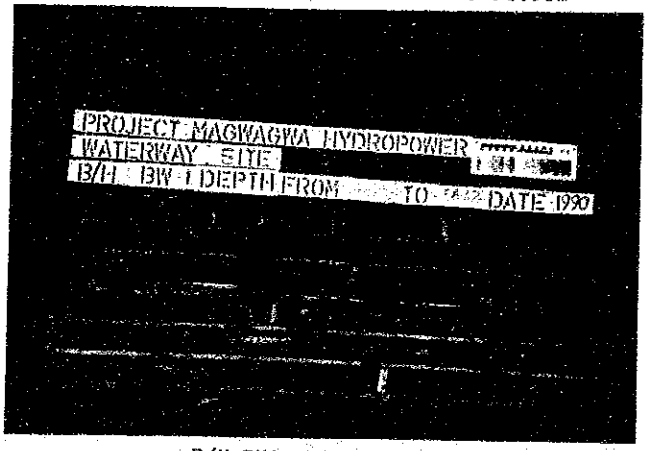
B/H BW1 FROM 24.98 TO 33.35m



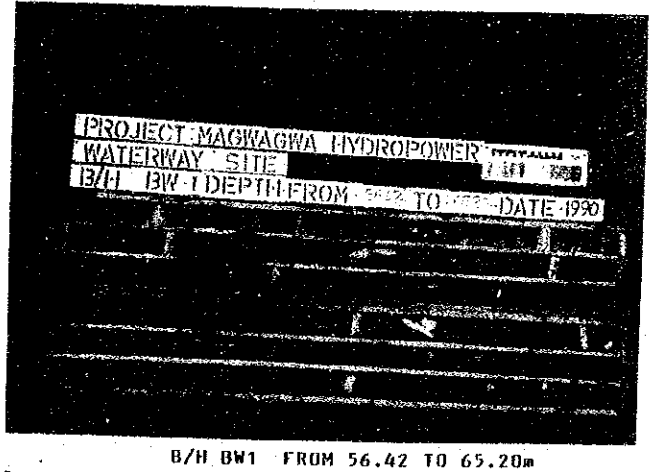
B/H BW1 FROM 33.35 TO 38.50m



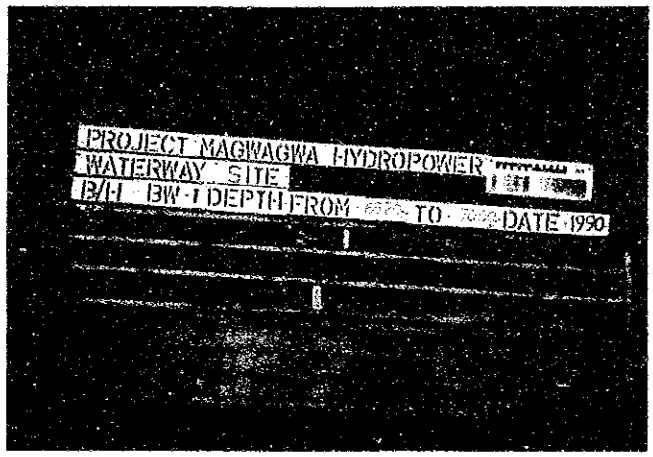
B/H BW1 FROM 38.50 TO 48.25m



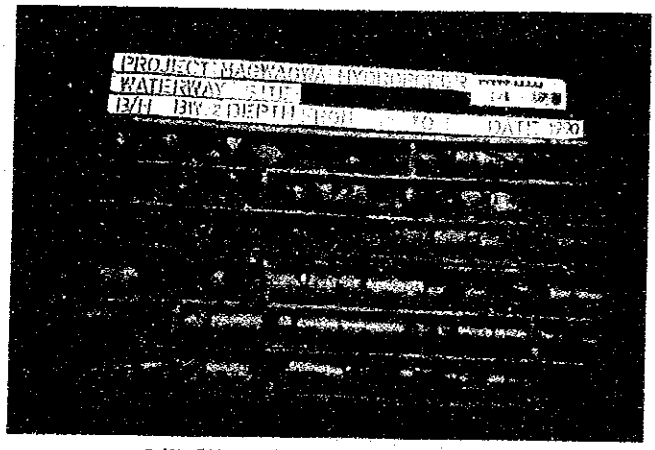
B/H BW1 FROM 48.25 TO 56.42m



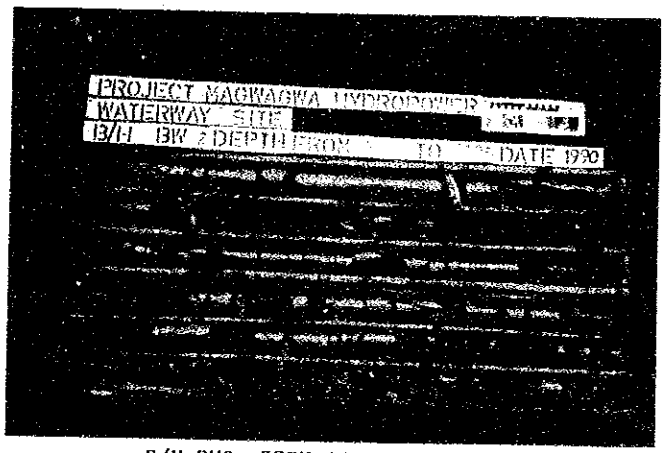
B/H BW1 FROM 56.42 TO 65.20m



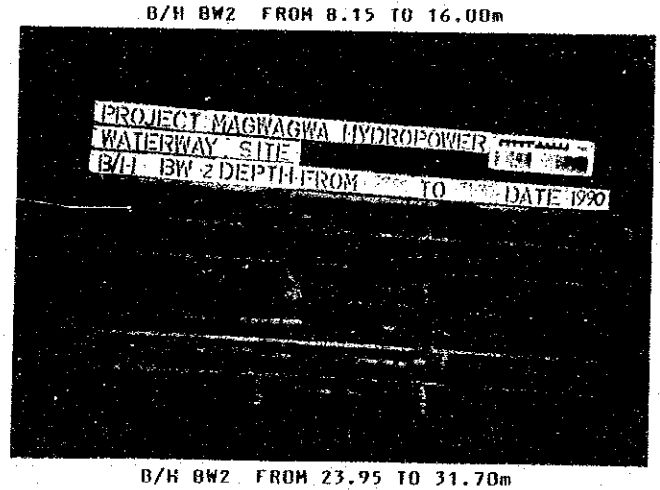
B/H BW1 FROM 65.20 TO 70.00m (END OF B/H)



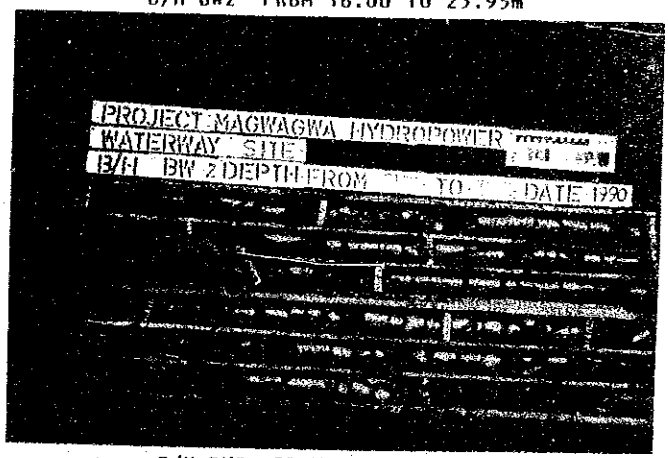
B/H BW2 FROM 8.15 TO 16.00m



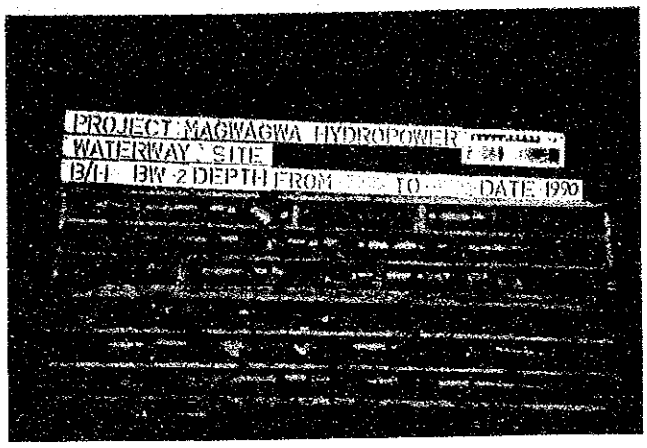
B/H BW2 FROM 16.00 TO 23.95m



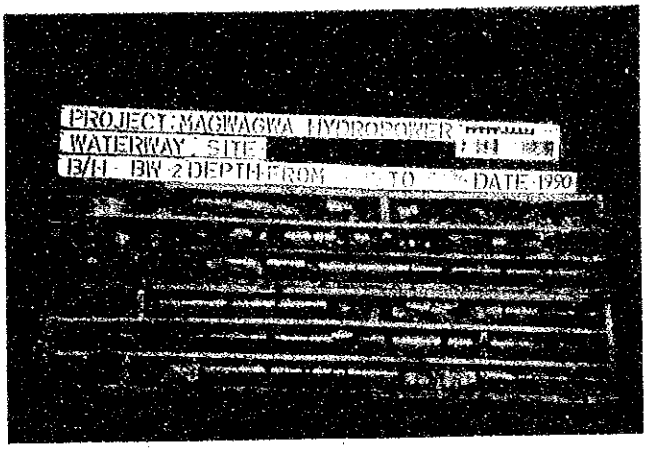
B/H BW2 FROM 23.95 TO 31.70m



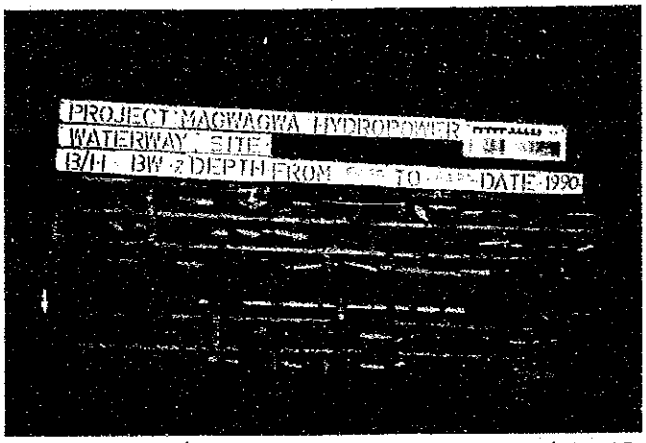
B/H BW2 FROM 31.70 TO 39.70m



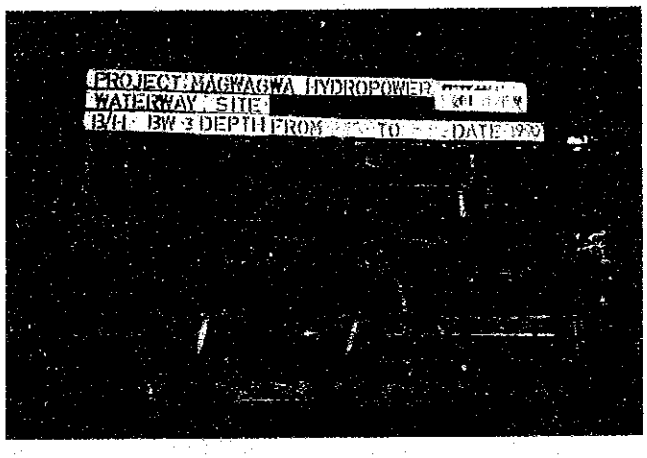
B/H BW2 FROM 39.70 TO 47.90m



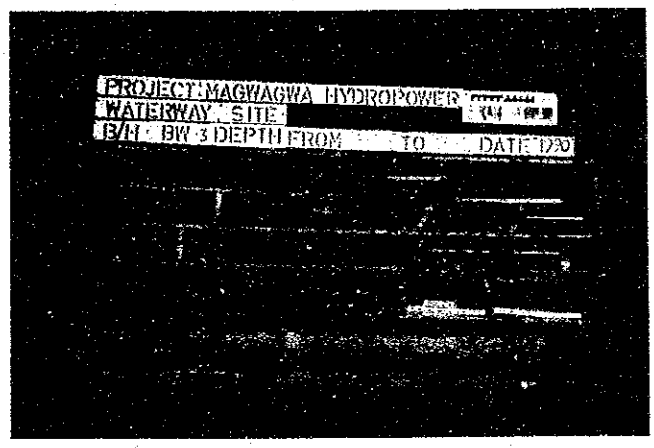
B/H BW2 FROM 47.90 TO 56.35m



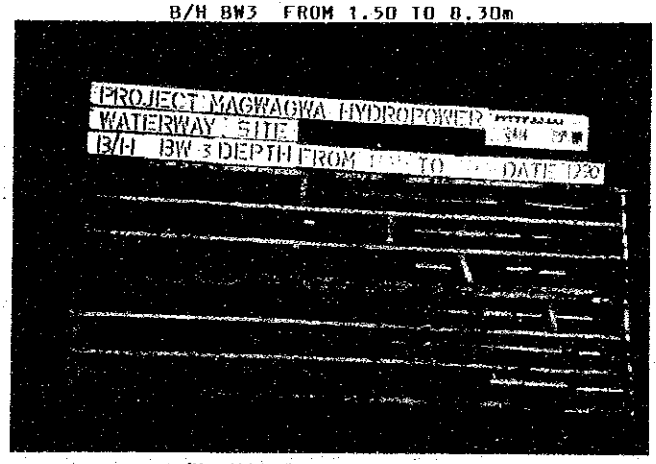
B/H BW2 FROM 56.35 TO 64.80m (END OF B/H)



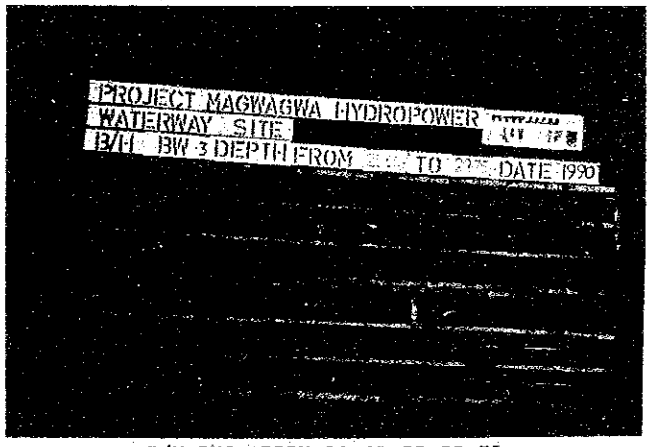
B/H BW3 FROM 1.50 TO 8.30m



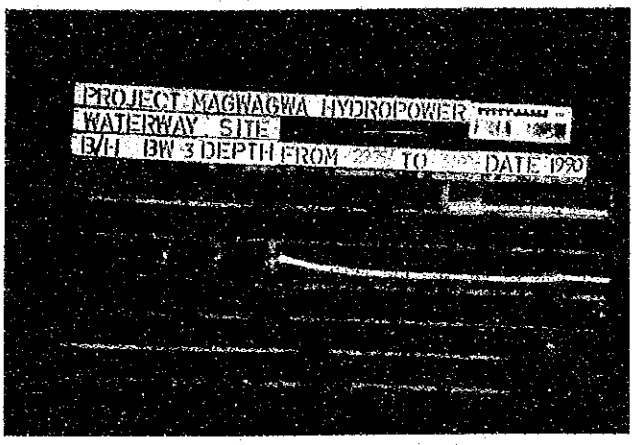
B/H BW3 FROM 8.50 TO 13.45m



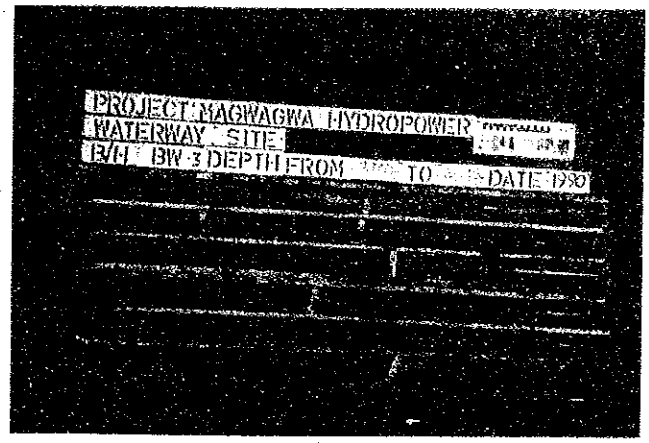
B/H BW3 FROM 13.45 TO 21.60m



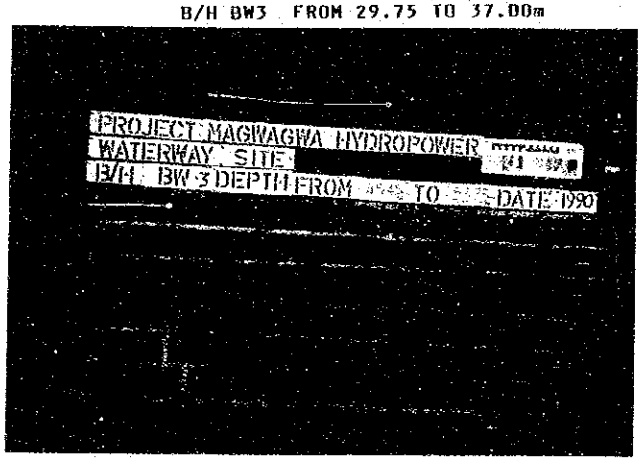
B/H BW3 FROM 21.60 TO 29.75m



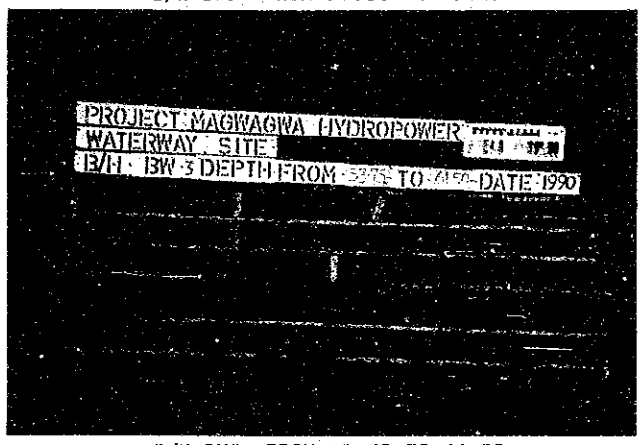
B/H BW3 FROM 29.75 TO 37.00m



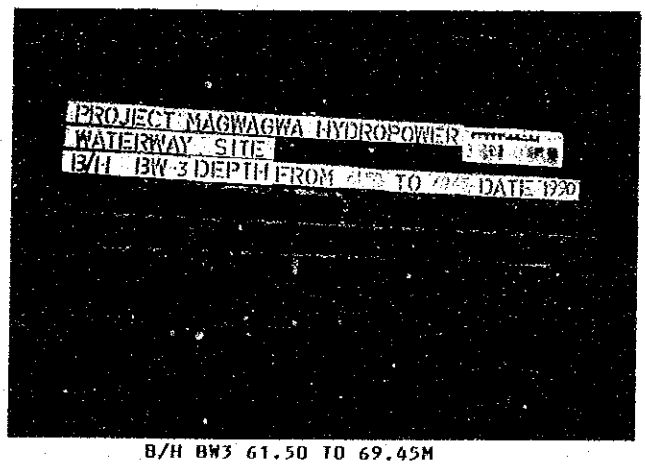
B/H BW3 FROM 37.00 TO 45.45m



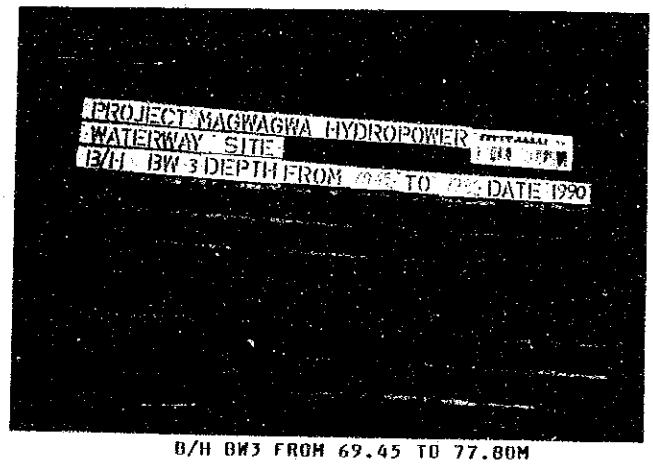
B/H BW3 FROM 45.45 TO 53.75m



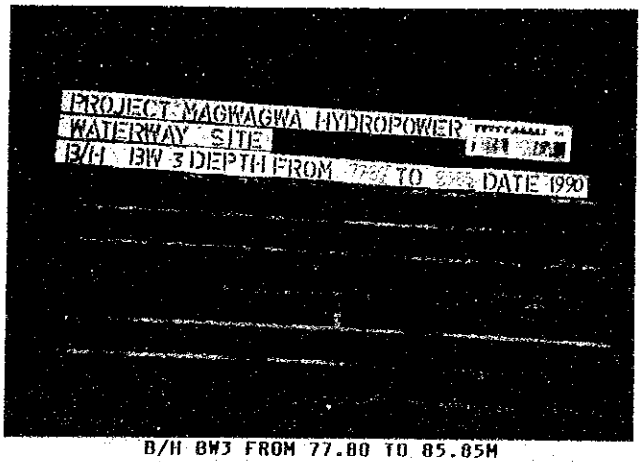
B/H BW3 FROM 53.75 TO 61.50m



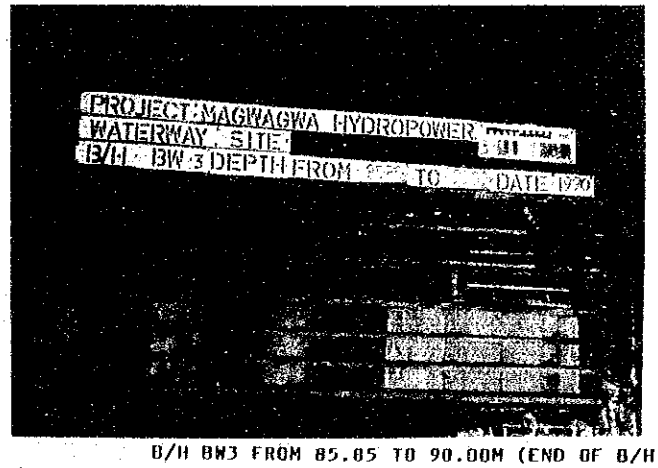
B/H BW3 61.50 TO 69.45M



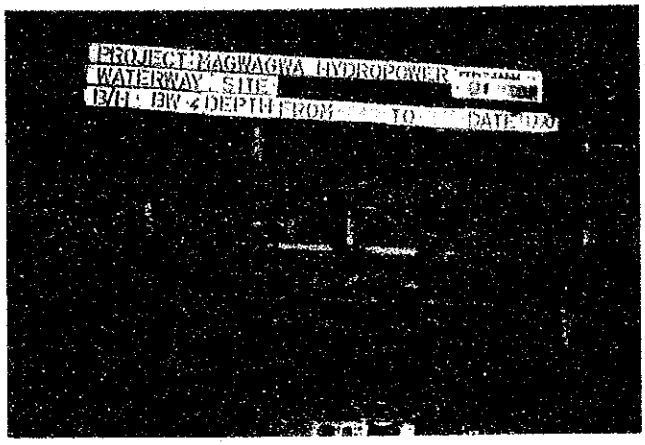
B/H BW3 FROM 69.45 TO 77.80M



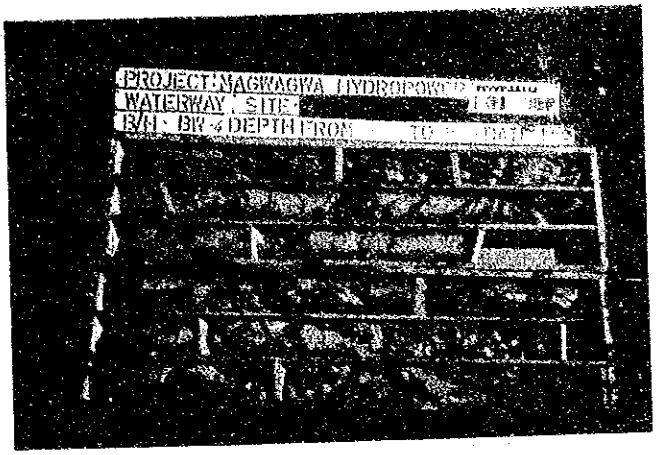
B/H BW3 FROM 77.80 TO 85.85M



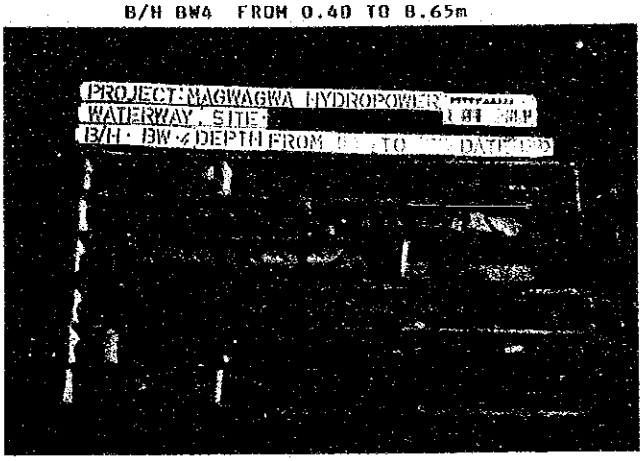
B/H BW3 FROM 85.85 TO 90.00M (END OF B/H)



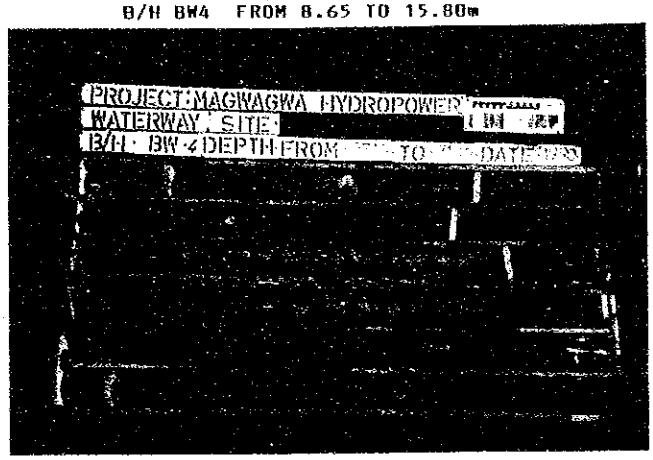
B/H BW4 FROM 0.40 TO 8.65m



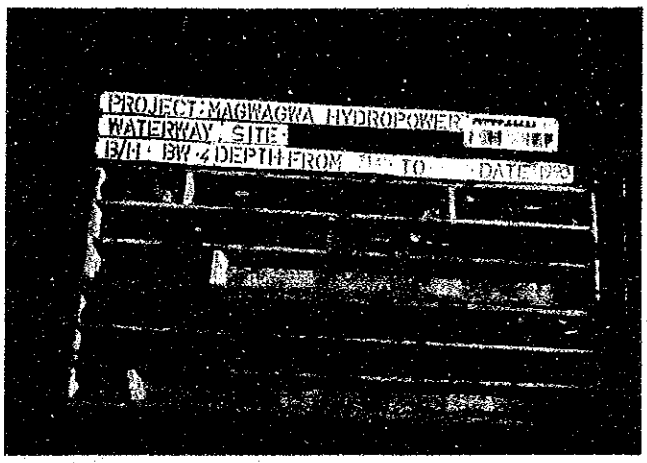
B/H BW4 FROM 8.65 TO 15.80m



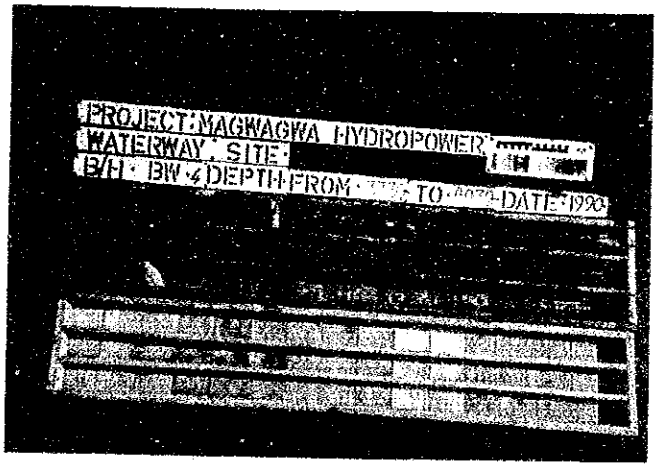
B/H BW4 FROM 15.80 TO 23.10m



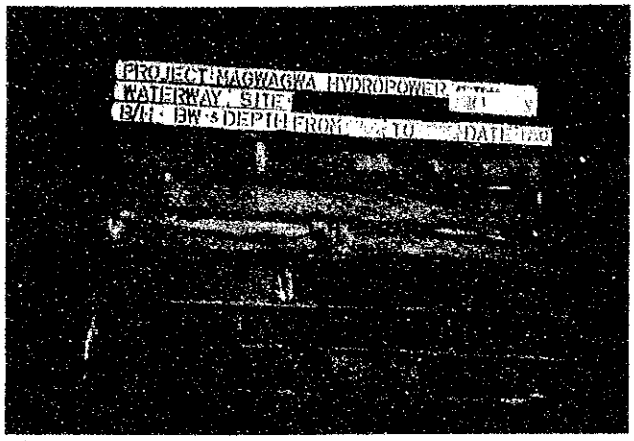
B/H BW4 FROM 23.10 TO 31.40m



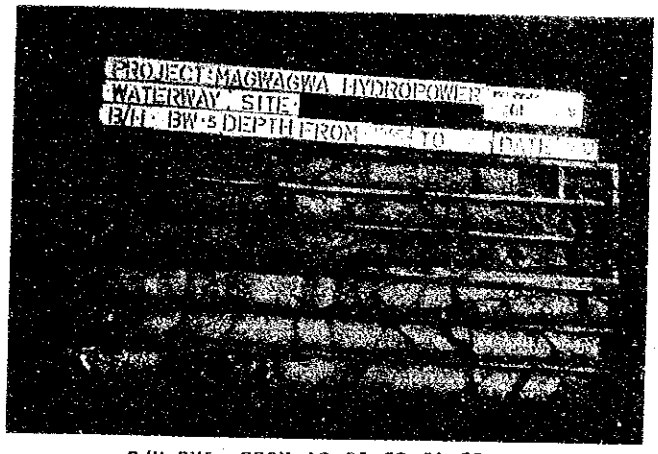
B/H BW4 FROM 31.40 TO 37.30m



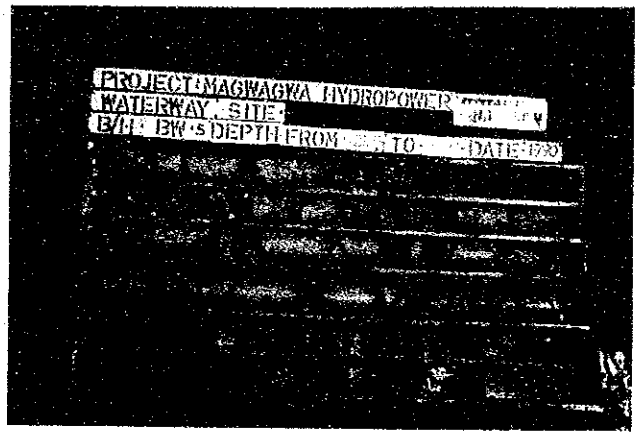
B/H BW4 FROM 37.30 TO 40.30m (END OF B/H)



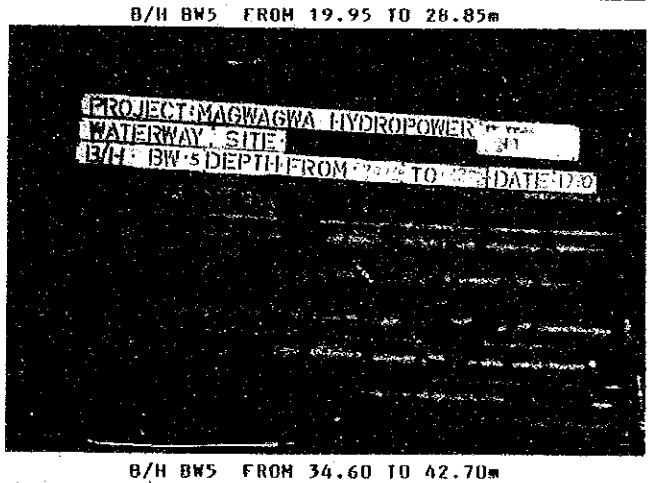
B/H BW5 FROM 7.00 TO 19.95m



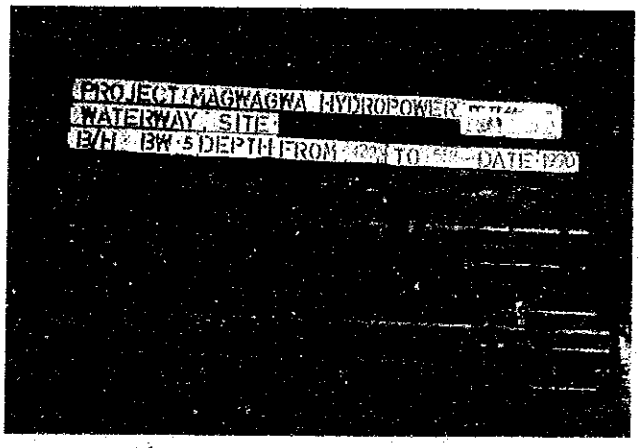
B/H BW5 FROM 19.95 TO 28.85m



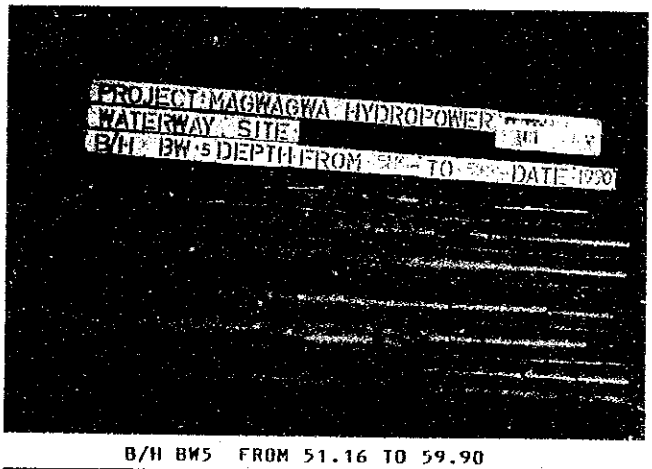
B/H BW5 FROM 78.85 TO 34.60m



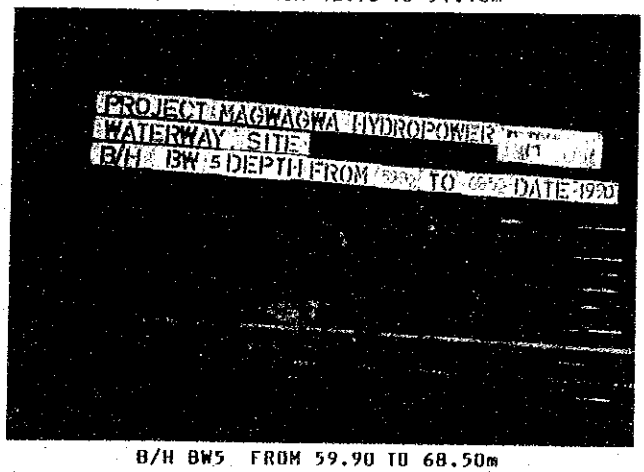
B/H BW5 FROM 34.60 TO 42.70m



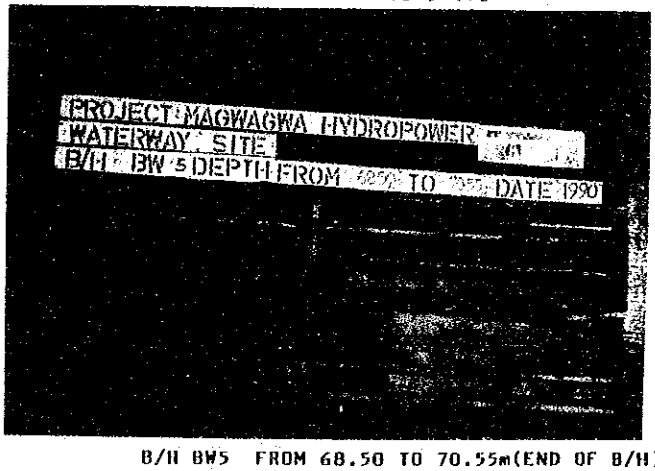
B/H BW5 FROM 42.70 TO 51.16m



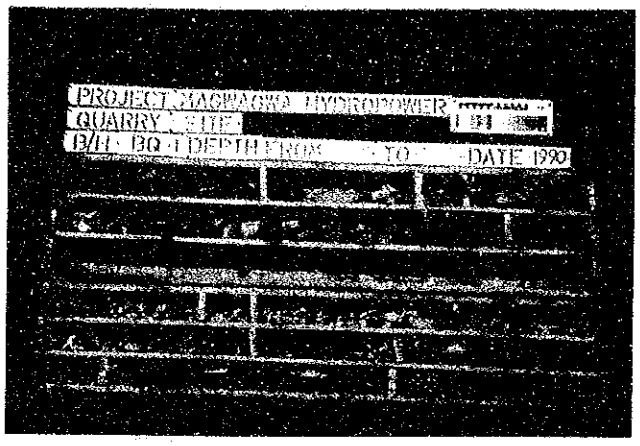
B/H BW5 FROM 51.16 TO 59.90



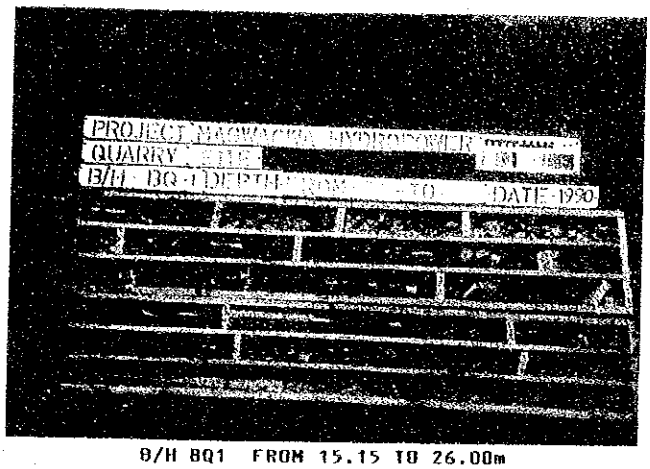
B/H BW5 FROM 59.90 TO 68.50m



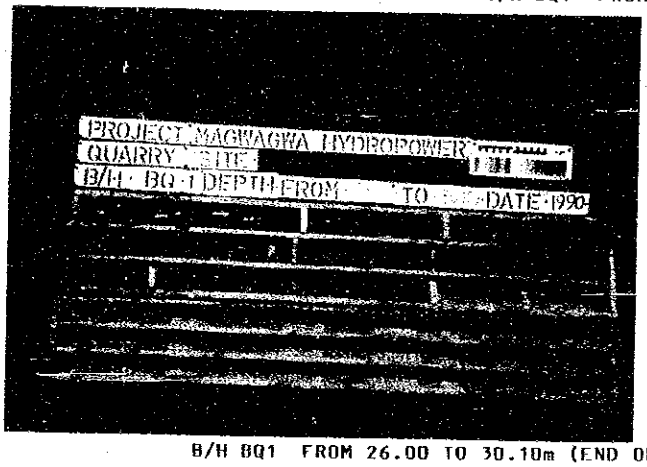
B/H BW5 FROM 68.50 TO 70.55m(END OF B/H)



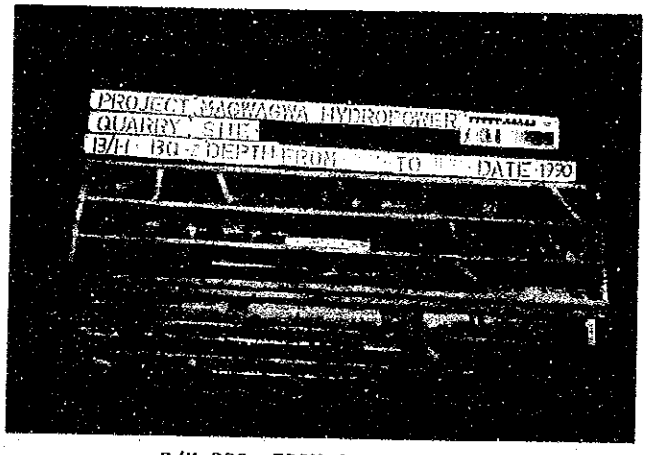
B/H BQ1 FROM 0.00 TO 15.15m



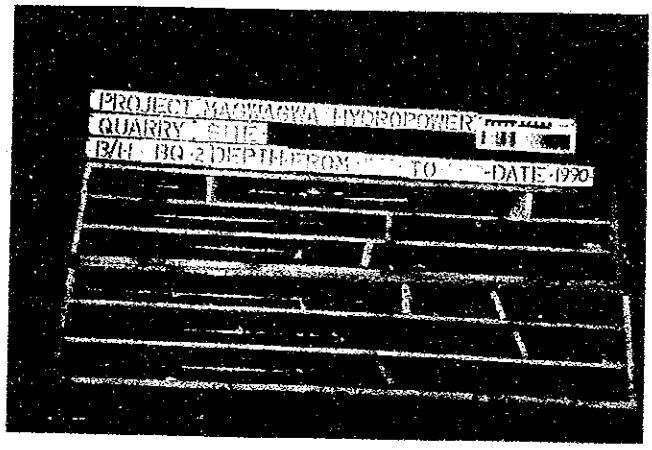
B/H BQ1 FROM 15.15 TO 26.00m



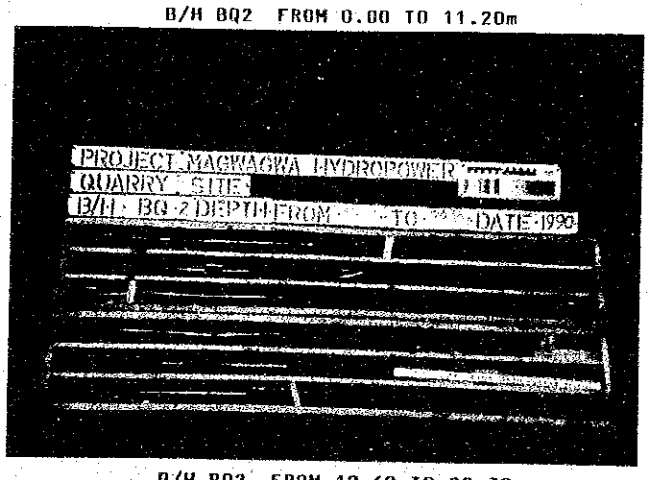
B/H BQ1 FROM 26.00 TO 30.10m (END OF B/H)



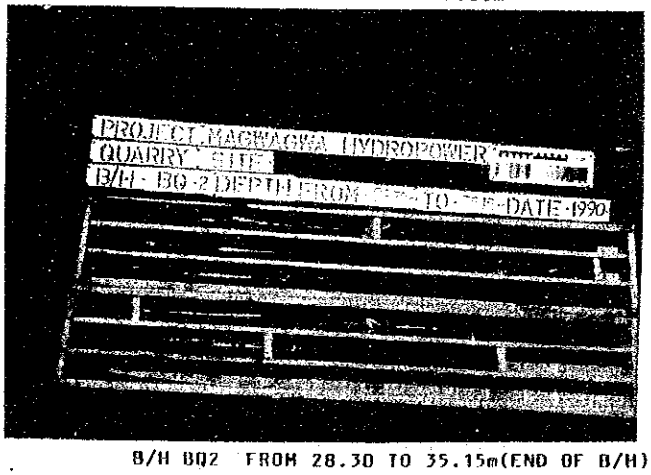
B/H BQ2 FROM 0.00 TO 11.20m



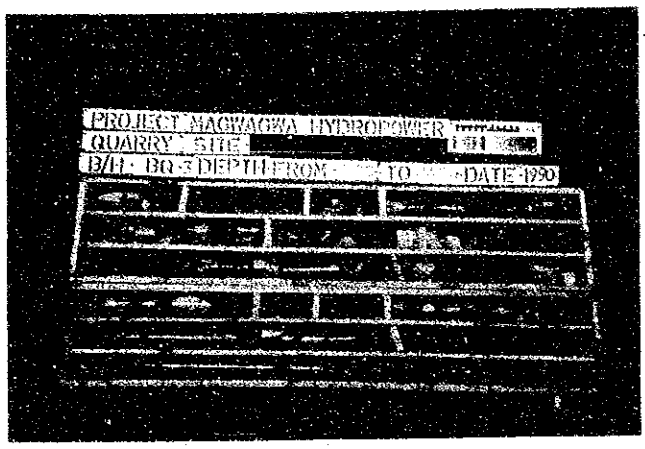
B/H BQ2 FROM 11.20 TO 19.60m



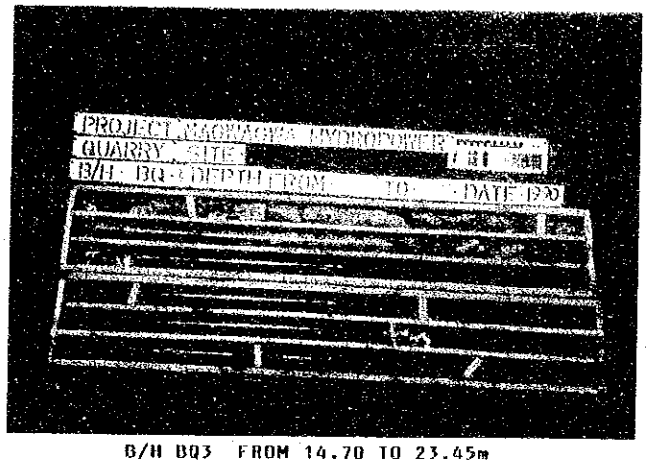
B/H BQ2 FROM 19.60 TO 28.30m



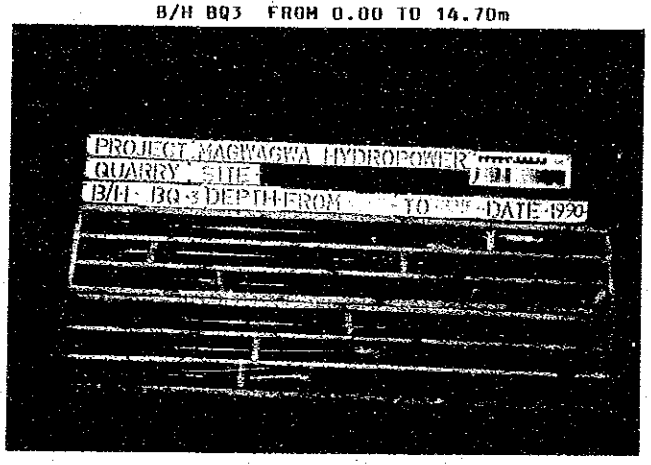
B/H BQ2 FROM 28.30 TO 35.15m(END OF B/H)



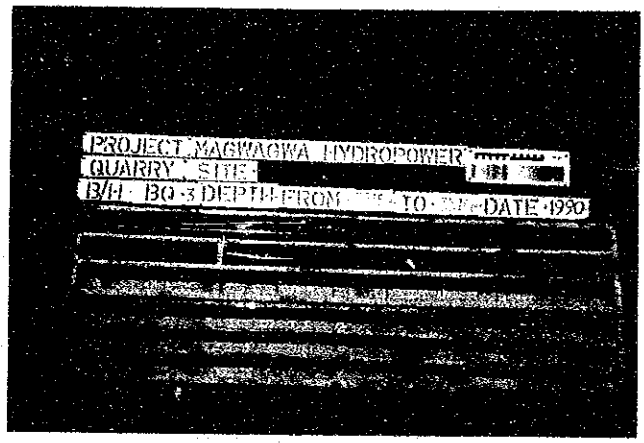
B/H BQ3 FROM 0.00 TO 14.70m



B/H BQ3 FROM 14.70 TO 23.45m



B/H BQ3 FROM 23.45 TO 32.15m



B/H BQ3 FROM 32.15 TO 35.10m (END OF B/H)

II.4 Results of Permability Test

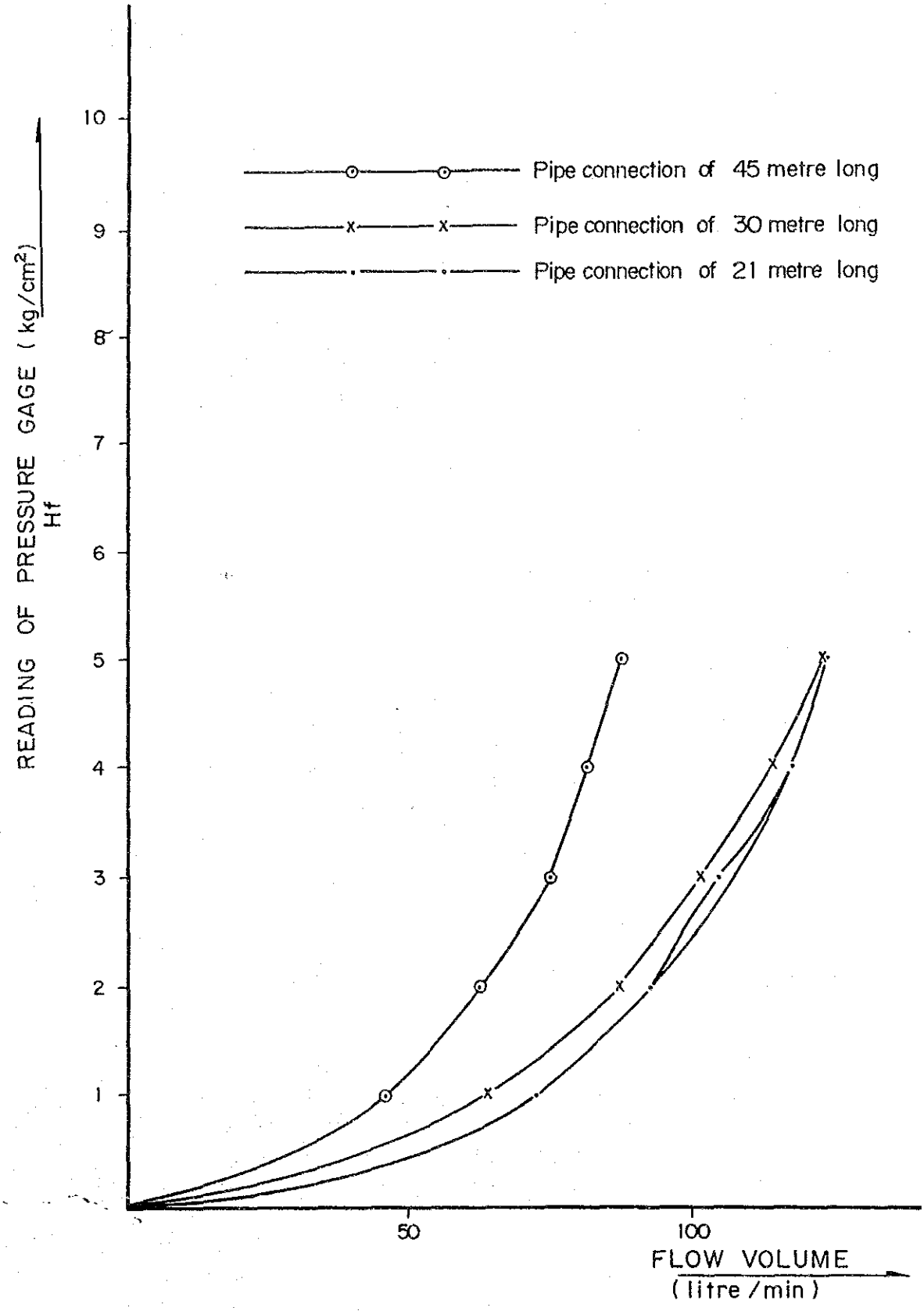


Figure 20 Friction Loss Curve

CONSTANT HEAD TEST　　HOLE NO. BD1 45

DEPTH(m): 5.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.25	0.0	143.0	1.00	5.00	.6	5.5	0.000012

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST　　HOLE NO. BD1 45

DEPTH(m): 10.5

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.00	0.0	113.0	0.00	7.50	.8	.0	0.000000

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD1 45

DEPTH(m): 11.65-16.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	46.2	9.24	5.0	101.0	0.00	7.80	2.4	38.5	0.000469

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY　　Hf(kg/cm2) 0.4

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD1 45

DEPTH(m): 16.65-21.55

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	44.0	8.97	4.9	101.0	0.30	7.40	2.4	37.4	0.000454
4.0	62.5	12.74	4.9	101.0	0.30	7.40	4.4	29.0	0.000352
2.0	43.9	8.95	4.9	101.0	0.30	7.40	2.4	37.3	0.000453

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY　　Hf(kg/cm2) 0.4

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 22.65-27.30

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.7	0.58	4.7	86.0	0.40	7.20	2.8	2.1	0.000026
4.0	4.5	0.96	4.7	86.0	0.40	7.20	4.8	2.0	0.000025
6.0	6.1	1.30	4.7	86.0	0.40	7.20	6.8	1.9	0.000024
8.0	8.0	1.72	4.7	86.0	0.40	7.20	8.8	1.9	0.000024
10.0	9.9	2.13	4.7	86.0	0.40	7.20	10.8	2.0	0.000024
8.0	8.5	1.83	4.7	86.0	0.40	7.20	8.8	2.1	0.000026
6.0	6.5	1.40	4.7	86.0	0.40	7.20	6.8	2.0	0.000025
4.0	4.3	0.92	4.7	86.0	0.40	7.20	4.8	1.9	0.000024
2.0	2.2	0.47	4.7	86.0	0.40	7.20	2.8	1.7	0.000021

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 27.3-32.5

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL. m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.0	0.58	5.2	86.0	0.35	6.20	2.7	2.2	0.000028
4.0	4.6	0.88	5.2	86.0	0.35	6.20	4.7	1.9	0.000024
6.0	6.7	1.29	5.2	86.0	0.35	6.20	6.7	1.9	0.000025
8.0	9.6	1.85	5.2	86.0	0.35	6.20	8.7	2.1	0.000027
10.0	11.9	2.28	5.2	86.0	0.35	6.20	10.7	2.1	0.000027
8.0	9.7	1.86	5.2	86.0	0.35	6.20	8.7	2.1	0.000027
6.0	7.4	1.41	5.2	86.0	0.35	6.20	6.7	2.1	0.000027
4.0	4.8	0.91	5.2	86.0	0.35	6.20	4.7	2.0	0.000025
2.0	3.1	0.60	5.2	86.0	0.35	6.20	2.7	2.2	0.000029

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 32.5-37.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL. m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.0	0.41	4.8	86.0	1.25	6.70	2.8	1.5	0.000018
4.0	4.4	0.91	4.8	86.0	1.25	6.70	4.8	1.9	0.000024
6.0	7.6	1.57	4.8	86.0	1.25	6.70	6.8	2.3	0.000029
8.0	11.8	2.45	4.8	86.0	1.25	6.70	8.8	2.8	0.000035
10.0	15.4	3.21	4.8	86.0	1.25	6.70	10.8	3.0	0.000037
8.0	12.1	2.51	4.8	86.0	1.25	6.70	8.8	2.9	0.000036
6.0	8.8	1.83	4.8	86.0	1.25	6.70	6.8	2.7	0.000034
4.0	5.6	1.17	4.8	86.0	1.25	6.70	4.8	2.4	0.000030
2.0	2.9	0.60	4.8	86.0	1.25	6.70	2.8	2.2	0.000027

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 42.65-47.70

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.4	86.0	1.00	5.20	2.6	.0	0.000000
4.0	0.9	0.17	5.4	86.0	1.00	5.20	4.6	.4	0.000005
6.0	3.3	0.61	5.4	86.0	1.00	5.20	6.6	.9	0.000012
8.0	4.8	0.89	5.4	86.0	1.00	5.20	8.6	1.0	0.000013
10.0	6.9	1.29	5.4	86.0	1.00	5.20	10.6	1.2	0.000016
8.0	5.3	0.98	5.4	86.0	1.00	5.20	8.6	1.1	0.000015
6.0	3.1	0.57	5.4	86.0	1.00	5.20	6.6	.9	0.000011
4.0	0.9	0.17	5.4	86.0	1.00	5.20	4.6	.4	0.000005
2.0	0.2	0.04	5.4	86.0	1.00	5.20	2.6	.1	0.000002

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 37.3-42.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.1	76.0	0.30	5.40	2.6	.0	0.000000
4.0	0.4	0.08	5.1	76.0	0.30	5.40	4.6	.2	0.000002
6.0	1.1	0.22	5.1	76.0	0.30	5.40	6.6	.3	0.000004
8.0	2.3	0.45	5.1	76.0	0.30	5.40	8.6	.5	0.000007
10.0	3.3	0.65	5.1	76.0	0.30	5.40	10.6	.6	0.000008
8.0	2.3	0.46	5.1	76.0	0.30	5.40	8.6	.5	0.000007
6.0	1.3	0.25	5.1	76.0	0.30	5.40	6.6	.4	0.000005
4.0	0.5	0.09	5.1	76.0	0.30	5.40	4.6	.2	0.000003
2.0	0.0	0.00	5.1	76.0	0.30	5.40	2.6	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 47.7-52.2

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.5	76.0	1.30	5.60	2.7	.0	0.000000
4.0	0.0	0.00	4.5	76.0	1.30	5.60	4.7	.0	0.000000
6.0	0.5	0.11	4.5	76.0	1.30	5.60	6.7	.2	0.000002
8.0	0.7	0.14	4.5	76.0	1.30	5.60	8.7	.2	0.000002
10.0	1.1	0.24	4.5	76.0	1.30	5.60	10.7	.2	0.000003
8.0	0.5	0.11	4.5	76.0	1.30	5.60	8.7	.1	0.000002
6.0	0.0	0.00	4.5	76.0	1.30	5.60	6.7	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 52.3-57.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.6	0.72	5.0	76.0	1.15	5.65	2.7	2.7	0.000035
4.0	6.6	1.32	5.0	76.0	1.15	5.65	4.7	2.8	0.000037
6.0	8.0	1.59	5.0	76.0	1.15	5.65	6.7	2.4	0.000031
8.0	9.8	1.95	5.0	76.0	1.15	5.65	8.7	2.2	0.000029
10.0	10.6	2.12	5.0	76.0	1.15	5.65	10.7	2.0	0.000026
8.0	8.0	1.60	5.0	76.0	1.15	5.65	8.7	1.8	0.000024
6.0	6.2	1.23	5.0	76.0	1.15	5.65	6.7	1.8	0.000024
4.0	4.4	0.87	5.0	76.0	1.15	5.65	4.7	1.9	0.000024
2.0	2.4	0.47	5.0	76.0	1.15	5.65	2.7	1.8	0.000023

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 57.3-62.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.3	0.66	5.0	76.0	0.85	5.60	2.6	2.5	0.000032
4.0	5.6	1.11	5.0	76.0	0.85	5.60	4.6	2.4	0.000031
6.0	6.1	1.21	5.0	76.0	0.85	5.60	6.6	1.8	0.000024
8.0	8.0	1.60	5.0	76.0	0.85	5.60	8.6	1.9	0.000024
10.0	10.1	2.02	5.0	76.0	0.85	5.60	10.6	1.9	0.000025
8.0	8.1	1.61	5.0	76.0	0.85	5.60	8.6	1.9	0.000024
6.0	6.3	1.26	5.0	76.0	0.85	5.60	6.6	1.9	0.000025
4.0	5.1	1.01	5.0	76.0	0.85	5.60	4.6	2.2	0.000028
2.0	3.5	0.69	5.0	76.0	0.85	5.60	2.6	2.6	0.000034

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 62.3-67.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	4.6	0.91	5.0	76.0	0.40	5.60	2.6	3.5	0.000045
4.0	6.1	1.21	5.0	76.0	0.40	5.60	4.6	2.6	0.000034
6.0	8.2	1.64	5.0	76.0	0.40	5.60	6.6	2.5	0.000032
8.0	10.6	2.12	5.0	76.0	0.40	5.60	8.6	2.5	0.000032
10.0	12.9	2.58	5.0	76.0	0.40	5.60	10.6	2.4	0.000032
8.0	10.4	2.07	5.0	76.0	0.40	5.60	8.6	2.4	0.000031
6.0	8.1	1.61	5.0	76.0	0.40	5.60	6.6	2.4	0.000032
4.0	5.5	1.10	5.0	76.0	0.40	5.60	4.6	2.4	0.000031
2.0	4.3	0.86	5.0	76.0	0.40	5.60	2.6	3.3	0.000043

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 67.3-72.25

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.5	0.70	5.0	76.0	1.50	5.30	2.7	2.6	0.000034
4.0	5.7	1.15	5.0	76.0	1.50	5.30	4.7	2.5	0.000032
6.0	8.5	1.71	5.0	76.0	1.50	5.30	6.7	2.6	0.000033
8.0	10.6	2.14	5.0	76.0	1.50	5.30	8.7	2.5	0.000032
10.0	13.5	2.73	5.0	76.0	1.50	5.30	10.7	2.6	0.000033
8.0	11.6	2.33	5.0	76.0	1.50	5.30	8.7	2.7	0.000035
6.0	8.1	1.64	5.0	76.0	1.50	5.30	6.7	2.4	0.000032
4.0	5.3	1.07	5.0	76.0	1.50	5.30	4.7	2.3	0.000030
2.0	3.5	0.07	5.0	76.0	1.50	5.30	2.7	2.6	0.000034

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 72.25-77.40

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	61.6	11.96	5.2	76.0	1.15	5.30	.6	185.4	0.002415

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY Hf(kg/cm2) 1.9

RECORD OF WATER PRESSURE TEST HOLE NO. BD1 45

DEPTH(m): 77.4-80.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.4	0.83	2.9	76.0	0.55	5.30	2.6	3.2	0.000037
4.0	3.5	1.19	2.9	76.0	0.55	5.30	4.6	2.6	0.000030
6.0	4.9	0.67	2.9	76.0	0.55	5.30	6.6	2.5	0.000029
8.0	6.5	2.24	2.9	76.0	0.55	5.30	8.6	2.6	0.000030
10.0	8.8	3.03	2.9	76.0	0.55	5.30	10.6	2.9	0.000033
8.0	6.9	2.38	2.9	76.0	0.55	5.30	8.6	2.8	0.000032
6.0	4.8	1.66	2.9	76.0	0.55	5.30	6.6	2.5	0.000029
4.0	3.5	1.21	2.9	76.0	0.55	5.30	4.6	2.6	0.000030
2.0	2.4	0.81	2.9	76.0	0.55	5.30	2.6	3.1	0.000036

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BD2

DEPTH(m): 6.85

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	1.3	13.25	0.0	131.0	0.35	6.85	.7	213.0	0.000429

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 8.45-13.45

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.4	66.3	13.27	5.0	131.0	0.65	7.40	1.2	110.0	0.001265

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 13.45-18.55

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	11.0	2.14	5.1	101.0	0.20	8.30	2.9	7.5	0.000092
4.0	63.3	12.40	5.1	101.0	0.20	8.30	4.9	25.6	0.000313

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 18.55-23.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	11.5	2.25	5.1	101.0	1.20	7.60	2.6	8.7	0.000106
4.0	50.7	9.93	5.1	101.0	1.20	7.60	4.6	21.6	0.000264
6.0	67.7	13.26	5.1	101.0	1.20	7.60	6.6	20.1	0.000246
4.0	50.1	9.81	5.1	101.0	1.20	7.60	4.6	21.3	0.000261
2.0	12.1	2.37	5.1	101.0	1.20	7.60	2.6	9.1	0.000112

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY Hf(kg/cm2) 0.3

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 25.30-30.30

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.8	0.75	5.0	76.0	0.80	7.20	2.8	2.7	0.000035
4.0	6.5	1.29	5.0	76.0	0.80	7.20	4.8	2.7	0.000035
6.0	8.5	1.69	5.0	76.0	0.80	7.20	6.8	2.5	0.000032
8.0	10.5	2.10	5.0	76.0	0.80	7.20	8.8	2.4	0.000031
10.0	14.9	2.97	5.0	76.0	0.80	7.20	10.8	2.8	0.000036
8.0	10.6	2.11	5.0	76.0	0.80	7.20	8.8	2.4	0.000031
6.0	7.7	1.53	5.0	76.0	0.80	7.20	6.8	2.3	0.000029
4.0	5.6	1.12	5.0	76.0	0.80	7.20	4.8	2.3	0.000030
2.0	4.2	0.83	5.0	76.0	0.80	7.20	2.8	3.0	0.000038

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 30.3-35.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	5.4	1.07	5.0	76.0	0.40	8.80	2.9	3.7	0.000047
4.0	8.4	1.67	5.0	76.0	0.40	8.80	4.9	3.4	0.000044
6.0	10.8	2.15	5.0	76.0	0.40	8.80	6.9	3.1	0.000040
8.0	16.3	3.26	5.0	76.0	0.40	8.80	8.9	3.7	0.000047
10.0	20.4	4.07	5.0	76.0	0.40	8.80	10.9	3.7	0.000048
8.0	15.4	3.08	5.0	76.0	0.40	8.80	8.9	3.5	0.000045
6.0	10.4	2.08	5.0	76.0	0.40	8.80	6.9	3.0	0.000039
4.0	7.5	1.50	5.0	76.0	0.40	8.80	4.9	3.0	0.000039
2.0	5.5	1.10	5.0	76.0	0.40	8.80	2.9	3.8	0.000049

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 35.3-40.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.2	0.63	5.0	76.0	1.50	8.00	3.0	2.1	0.000028
4.0	5.1	1.02	5.0	76.0	1.50	8.00	5.0	2.1	0.000027
6.0	7.4	1.48	5.0	76.0	1.50	8.00	7.0	2.1	0.000028
8.0	9.6	1.92	5.0	76.0	1.50	8.00	9.0	2.1	0.000028
10.0	12.4	2.47	5.0	76.0	1.50	8.00	11.0	2.3	0.000029
8.0	8.9	1.77	5.0	76.0	1.50	8.00	9.0	2.0	0.000026
6.0	6.0	1.19	5.0	76.0	1.50	8.00	7.0	1.7	0.000022
4.0	4.4	0.88	5.0	76.0	1.50	8.00	5.0	1.8	0.000023
2.0	2.8	0.55	5.0	76.0	1.50	8.00	3.0	1.9	0.000024

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 40.3-45.5

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	5.1	0.97	5.2	76.0	1.05	7.30	2.8	3.4	0.000045
4.0	8.2	1.58	5.2	76.0	1.05	7.30	4.8	3.3	0.000043
6.0	11.8	2.27	5.2	76.0	1.05	7.30	6.8	3.3	0.000043
8.0	17.8	3.41	5.2	76.0	1.05	7.30	8.8	3.9	0.000050
10.0	24.2	4.64	5.2	76.0	1.05	7.30	10.8	4.3	0.000056
8.0	16.3	3.13	5.2	76.0	1.05	7.30	8.8	3.5	0.000046
6.0	11.2	2.15	5.2	76.0	1.05	7.30	6.8	3.2	0.000041
4.0	6.8	1.31	5.2	76.0	1.05	7.30	4.8	2.7	0.000035
2.0	5.1	0.97	5.2	76.0	1.05	7.30	2.8	3.4	0.000045

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD2

DEPTH(m): 45.5-50.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.4	0.50	4.8	76.0	0.45	8.70	2.9	1.7	0.000022
4.0	4.6	0.95	4.8	76.0	0.45	8.70	4.9	1.9	0.000025
6.0	6.4	1.33	4.8	76.0	0.45	8.70	6.9	1.9	0.000025
8.0	8.3	1.72	4.8	76.0	0.45	8.70	8.9	1.9	0.000025
10.0	10.7	2.22	4.8	76.0	0.45	8.70	10.9	2.0	0.000026
8.0	8.5	1.77	4.8	76.0	0.45	8.70	8.9	2.0	0.000025
6.0	5.9	1.23	4.8	76.0	0.45	8.70	6.9	1.8	0.000023
4.0	4.2	0.86	4.8	76.0	0.45	8.70	4.9	1.8	0.000023
2.0	2.5	0.52	4.8	76.0	0.45	8.70	2.9	1.8	0.000023

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 2.5-7.45

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	16.9	3.42	5.0	101.0	0.50	1.45	2.2	15.6	0.000190

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 7.45-12.7

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	13.3	2.52	5.3	101.0	0.20	0.20	2.0	12.4	0.000152
3.5	27.9	5.30	5.3	101.0	0.20	0.20	3.5	15.0	0.000185
2.0	15.7	2.98	5.3	101.0	0.20	0.20	2.0	14.6	0.000180

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 12.70-17.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	14.7	3.00	5.0	86.0	1.20	1.90	2.3	12.8	0.000161
4.0	32.6	6.59	5.0	86.0	1.20	1.90	4.3	15.3	0.000192
6.0	51.1	10.32	5.0	86.0	1.20	1.90	6.3	16.4	0.000206
4.0	32.4	6.54	5.0	86.0	1.20	1.90	4.3	15.2	0.000191
2.0	14.9	3.00	5.0	86.0	1.20	1.90	2.3	13.0	0.000163

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 17.65-23.35

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.7	86.0	0.60	2.40	2.3	.0	0.000000
3.5	0.0	0.00	5.7	86.0	0.60	2.40	3.8	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 23.35-28.40

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.5	0.10	5.1	86.0	0.70	2.00	2.3	.4	0.000006
4.0	1.2	0.23	5.1	86.0	0.70	2.00	4.3	.5	0.000007
6.0	1.9	0.38	5.1	86.0	0.70	2.00	6.3	.6	0.000008
8.0	4.0	0.79	5.1	86.0	0.70	2.00	8.3	1.0	0.000012
6.0	2.1	0.42	5.1	86.0	0.70	2.00	6.3	.7	0.000008
4.0	1.0	0.20	5.1	86.0	0.70	2.00	4.3	.5	0.000006
2.0	0.5	0.10	5.1	86.0	0.70	2.00	2.3	.4	0.000006

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 29.4-34.45

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.7	0.33	5.1	76.0	1.35	2.00	2.3	1.4	0.000018
4.0	3.5	0.68	5.1	76.0	1.35	2.00	4.3	1.6	0.000020
6.0	5.6	1.11	5.1	76.0	1.35	2.00	6.3	1.8	0.000023
8.0	7.8	1.54	5.1	76.0	1.35	2.00	8.3	1.9	0.000024
10.0	9.8	1.94	5.1	76.0	1.35	2.00	10.3	1.9	0.000024
8.0	8.0	1.57	5.1	76.0	1.35	2.00	8.3	1.9	0.000024
6.0	5.8	1.14	5.1	76.0	1.35	2.00	6.3	1.8	0.000023
4.0	3.5	0.69	5.1	76.0	1.35	2.00	4.3	1.6	0.000021
2.0	2.3	0.46	5.1	76.0	1.35	2.00	2.3	2.0	0.000025

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 34.45-39.55

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.7	0.13	5.1	76.0	0.85	2.00	2.3	.6	0.000007
4.0	1.6	0.31	5.1	76.0	0.85	2.00	4.3	.7	0.000010
6.0	3.3	0.64	5.1	76.0	0.85	2.00	6.3	1.0	0.000013
8.0	4.5	0.88	5.1	76.0	0.85	2.00	8.3	1.1	0.000014
10.0	6.2	1.21	5.1	76.0	0.85	2.00	10.3	1.2	0.000015
8.0	4.9	0.95	5.1	76.0	0.85	2.00	8.3	1.1	0.000015
6.0	3.2	0.62	5.1	76.0	0.85	2.00	6.3	1.0	0.000013
4.0	1.8	0.35	5.1	76.0	0.85	2.00	4.3	.8	0.000011
2.0	0.7	0.13	5.1	76.0	0.85	2.00	2.3	.6	0.000007

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD3

DEPTH(m): 39.55-44.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.2	76.0	0.40	2.00	2.2	.0	0.000000
4.0	0.0	0.00	5.2	76.0	0.40	2.00	4.2	.0	0.000000
6.0	0.5	0.10	5.2	76.0	0.40	2.00	6.2	.2	0.000002
8.0	1.0	0.19	5.2	76.0	0.40	2.00	8.2	.2	0.000003
10.0	1.6	0.30	5.2	76.0	0.40	2.00	10.2	.3	0.000004
8.0	1.0	0.19	5.2	76.0	0.40	2.00	8.2	.2	0.000003
6.0	0.5	0.10	5.2	76.0	0.40	2.00	6.2	.2	0.000002
4.0	0.0	0.00	5.2	76.0	0.40	2.00	4.2	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD3

DEPTH(m): 44.75-50.15

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.4	76.0	1.25	2.00	2.3	.0	0.000000
4.0	0.0	0.00	5.4	76.0	1.25	2.00	4.3	.0	0.000000
6.0	0.0	0.00	5.4	76.0	1.25	2.00	6.3	.0	0.000000
8.0	0.4	0.07	5.4	76.0	1.25	2.00	8.3	.1	0.000001
10.0	1.0	0.19	5.4	76.0	1.25	2.00	10.3	.2	0.000002
8.0	0.5	0.09	5.4	76.0	1.25	2.00	8.3	.1	0.000001
6.0	0.0	0.00	5.4	76.0	1.25	2.00	6.3	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BD4

DEPTH(m): 6.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.00	0.0	86.0	0.00	1.70	.2	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 7.0-12.5

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	27.6	5.20	5.5	86.0	0.80	1.70	2.3	22.3	0.000287
4.0	52.1	9.46	5.5	86.0	0.80	1.70	4.3	22.3	0.000287
2.0	27.0	4.90	5.5	86.0	0.80	1.70	2.3	21.8	0.000280

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 12.5-17.1

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	40.7	8.75	4.6	86.0	0.90	1.50	2.1	42.1	0.000522
4.0	68.7	14.76	4.6	86.0	0.90	1.50	4.1	36.4	0.000451
2.0	35.9	7.71	4.6	86.0	0.90	1.50	2.1	37.1	0.000460

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY Hf(kg/cm2) 0.1

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 18.30-23.05

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	5.5	1.16	4.8	76.0	1.45	1.50	2.3	5.0	0.000065
4.0	8.2	1.73	4.8	76.0	1.45	1.50	4.3	4.0	0.000051
6.0	12.1	2.55	4.8	76.0	1.45	1.50	6.3	4.0	0.000052
8.0	16.4	3.44	4.8	76.0	1.45	1.50	8.3	4.1	0.000053
10.0	20.8	4.37	4.8	76.0	1.45	1.50	10.3	4.2	0.000054
8.0	16.3	3.43	4.8	76.0	1.45	1.50	8.3	4.1	0.000053
6.0	12.3	2.59	4.8	76.0	1.45	1.50	6.3	4.1	0.000053
4.0	8.2	1.72	4.8	76.0	1.45	1.50	4.3	4.0	0.000051
2.0	5.4	1.13	4.8	76.0	1.45	1.50	2.3	4.9	0.000063

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 23.05-29.60

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.4	0.21	6.6	76.0	0.80	1.50	2.2	1.0	0.000013
4.0	3.4	0.51	6.6	76.0	0.80	1.50	4.2	1.2	0.000017
6.0	5.4	0.82	6.6	76.0	0.80	1.50	6.2	1.3	0.000018
8.0	6.7	1.02	6.6	76.0	0.80	1.50	8.2	1.2	0.000017
10.0	9.6	1.47	6.6	76.0	0.80	1.50	10.2	1.4	0.000020
8.0	6.6	1.00	6.6	76.0	0.80	1.50	8.2	1.2	0.000017
6.0	4.9	0.74	6.6	76.0	0.80	1.50	6.2	1.2	0.000016
4.0	2.7	1.41	6.6	76.0	0.80	1.50	4.2	1.0	0.000013
2.0	1.1	0.17	6.6	76.0	0.80	1.50	2.2	.8	0.000010

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 29.6-34.6

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.0	76.0	1.10	1.50	2.3	.0	0.000000
4.0	0.0	0.00	5.0	76.0	1.10	1.50	4.3	.0	0.000000
6.0	1.1	0.21	5.0	76.0	1.10	1.50	6.3	.3	0.000004
8.0	2.5	0.49	5.0	76.0	1.10	1.50	8.3	.6	0.000008
10.0	3.7	0.73	5.0	76.0	1.10	1.50	10.3	.7	0.000009
8.0	2.5	0.49	5.0	76.0	1.10	1.50	8.3	.6	0.000008
6.0	1.2	0.24	5.0	76.0	1.10	1.50	6.3	.4	0.000005
4.0	0.0	0.00	5.0	76.0	1.10	1.50	4.3	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 35.4-40.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.9	66.0	1.40	0.60	2.2	.0	0.000000
4.0	0.0	0.00	4.9	66.0	1.40	0.60	4.2	.0	0.000000
6.0	0.5	0.10	4.9	66.0	1.40	0.60	6.2	.2	0.000002
8.0	1.4	0.28	4.9	66.0	1.40	0.60	8.2	.3	0.000004
10.0	2.5	0.51	4.9	66.0	1.40	0.60	10.2	.5	0.000007
8.0	1.3	0.27	4.9	66.0	1.40	0.60	8.2	.3	0.000004
6.0	0.5	0.09	4.9	66.0	1.40	0.60	6.2	.1	0.000002
4.0	0.0	0.00	4.9	66.0	1.40	0.60	4.2	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD4

DEPTH(m): 40.3-45.4

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.4	0.08	5.1	66.0	1.05	1.00	2.2	.4	0.000005
4.0	1.7	0.32	5.1	66.0	1.05	1.00	4.2	.8	0.000010
6.0	3.3	0.64	5.1	66.0	1.05	1.00	6.2	1.0	0.000014
8.0	4.8	0.93	5.1	66.0	1.05	1.00	8.2	1.1	0.000015
10.0	6.4	1.25	5.1	66.0	1.05	1.00	10.2	1.2	0.000016
8.0	4.6	0.89	5.1	66.0	1.05	1.00	8.2	1.1	0.000015
6.0	3.3	0.64	5.1	66.0	1.05	1.00	6.2	1.0	0.000014
4.0	1.8	0.34	5.1	66.0	1.05	1.00	4.2	.8	0.000011
2.0	0.4	0.08	5.1	66.0	1.05	1.00	2.2	.4	0.000005

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD4

DEPTH(m): 45.4-50.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.6	66.0	0.55	1.00	2.2	.0	0.000000
4.0	0.5	0.10	4.6	66.0	0.55	1.00	4.2	.2	0.000003
6.0	1.2	0.26	4.6	66.0	0.55	1.00	6.2	.4	0.000006
8.0	3.7	0.79	4.6	66.0	0.55	1.00	8.2	1.0	0.000013
10.0	5.3	1.15	4.6	66.0	0.55	1.00	10.2	1.1	0.000015
8.0	3.4	0.73	4.6	66.0	0.55	1.00	8.2	.9	0.000012
6.0	1.6	0.34	4.6	66.0	0.55	1.00	6.2	.5	0.000007
4.0	0.4	0.09	4.6	66.0	0.55	1.00	4.2	.2	0.000003
2.0	0.0	0.00	4.6	66.0	0.55	1.00	2.2	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BD5

DEPTH(m): 6.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.00	0.0	101.0	1.20	4.40	.6	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BD5

DEPTH(m): 10.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.1	1.25	0.0	101.0	0.50	4.00	.5	27.8	0.000083

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BD5

DEPTH(m): 15.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.25	0.0	101.0	0.00	4.20	.4	6.0	0.000018

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD5

DEPTH(m): 19.65-24.80

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	13.3	2.58	5.2	86.0	0.35	4.20	2.5	10.5	0.000134
4.0	32.6	6.33	5.2	86.0	0.35	4.20	4.5	14.2	0.000180
6.0	33.3	6.47	5.2	86.0	0.35	4.20	6.5	10.0	0.000127
8.0	37.4	7.26	5.2	86.0	0.35	4.20	8.5	8.6	0.000109
10.0	42.0	8.16	5.2	86.0	0.35	4.20	10.5	7.8	0.000099
8.0	38.0	7.39	5.2	86.0	0.35	4.20	8.5	8.7	0.000111
6.0	34.3	6.65	5.2	86.0	0.35	4.20	6.5	10.3	0.000131
4.0	31.8	6.17	5.2	86.0	0.35	4.20	4.5	13.9	0.000176
2.0	16.8	3.26	5.2	86.0	0.35	4.20	2.5	13.3	0.000169

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD5

DEPTH(m): 24.8-29.9

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	13.8	2.68	5.1	76.0	1.30	4.15	2.4	11.3	0.000147
4.0	18.6	3.61	5.1	76.0	1.30	4.15	4.4	8.3	0.000108
6.0	23.4	4.54	5.1	76.0	1.30	4.15	6.4	7.2	0.000093
8.0	29.7	5.77	5.1	76.0	1.30	4.15	8.4	6.9	0.000090
10.0	34.4	6.67	5.1	76.0	1.30	4.15	10.4	6.5	0.000084
8.0	30.0	5.83	5.1	76.0	1.30	4.15	8.4	7.0	0.000091
6.0	23.8	4.62	5.1	76.0	1.30	4.15	6.4	7.3	0.000095
4.0	18.1	3.50	5.1	76.0	1.30	4.15	4.4	8.0	0.000105
2.0	13.9	2.69	5.1	76.0	1.30	4.15	2.4	11.3	0.000147

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY HI(kg/cm2) 0.1

RECORD OF WATER PRESSURE TEST HOLE NO. BD5

DEPTH(m): 29.9-34.55

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	7.6	1.48	4.7	76.0	0.80	4.20	2.5	6.5	0.000083
4.0	9.7	1.87	4.7	76.0	0.80	4.20	4.5	4.6	0.000059
6.0	13.2	2.56	4.7	76.0	0.80	4.20	6.5	4.4	0.000056
8.0	15.1	2.93	4.7	76.0	0.80	4.20	8.5	3.8	0.000049
10.0	18.0	3.49	4.7	76.0	0.80	4.20	10.5	3.7	0.000047
8.0	16.1	3.12	4.7	76.0	0.80	4.20	8.5	4.1	0.000052
6.0	13.1	2.53	4.7	76.0	0.80	4.20	6.5	4.3	0.000055
4.0	10.1	1.96	4.7	76.0	0.80	4.20	4.5	4.8	0.000062
2.0	7.6	1.47	4.7	76.0	0.80	4.20	2.5	6.5	0.000083

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD5

DEPTH(m): 34.55-39.70

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	6.4	1.24	5.2	76.0	0.70	4.20	2.5	5.0	0.000065
4.0	8.5	1.64	5.2	76.0	0.70	4.20	4.5	3.7	0.000048
6.0	11.9	2.30	5.2	76.0	0.70	4.20	6.5	3.5	0.000046
8.0	14.3	2.78	5.2	76.0	0.70	4.20	8.5	3.3	0.000043
10.0	16.0	3.10	5.2	76.0	0.70	4.20	10.5	3.0	0.000038
8.0	14.3	2.77	5.2	76.0	0.70	4.20	8.5	3.3	0.000042
6.0	12.1	2.35	5.2	76.0	0.70	4.20	6.5	3.6	0.000047
4.0	8.2	1.59	5.2	76.0	0.70	4.20	4.5	3.5	0.000046
2.0	6.3	1.22	5.2	76.0	0.70	4.20	2.5	4.9	0.000064

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD5

DEPTH(m): 42.3-47.9

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.6	0.11	5.6	66.0	0.60	4.20	2.5	.4	0.000006
4.0	1.2	0.21	5.6	66.0	0.60	4.20	4.5	.5	0.000006
6.0	2.1	0.38	5.6	66.0	0.60	4.20	6.5	.6	0.000008
8.0	3.4	0.60	5.6	66.0	0.60	4.20	8.5	.7	0.000010
10.0	5.1	0.91	5.6	66.0	0.60	4.20	10.5	.9	0.000012
8.0	3.3	0.58	5.6	66.0	0.60	4.20	8.5	.7	0.000009
6.0	2.2	0.38	5.6	66.0	0.60	4.20	6.5	.6	0.000008
4.0	1.1	0.20	5.6	66.0	0.60	4.20	4.5	.4	0.000006
2.0	0.5	0.09	5.6	66.0	0.60	4.20	2.5	.4	0.000005

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD5

DEPTH(m): 47.9-50.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	2.1	66.0	1.10	4.30	2.5	.0	0.000000
4.0	0.5	0.24	2.1	66.0	1.10	4.30	4.5	.5	0.000006
6.0	1.1	0.52	2.1	66.0	1.10	4.30	6.5	.8	0.000009
8.0	2.1	1.00	2.1	66.0	1.10	4.30	8.5	1.2	0.000013
10.0	3.3	1.57	2.1	66.0	1.10	4.30	10.5	1.5	0.000016
8.0	2.2	1.02	2.1	66.0	1.10	4.30	8.5	1.2	0.000013
6.0	1.1	0.52	2.1	66.0	1.10	4.30	6.5	.8	0.000009
4.0	0.5	0.24	2.1	66.0	1.10	4.30	4.5	.5	0.000006
2.0	0.0	0.00	2.1	66.0	1.10	4.30	2.5	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD6

DEPTH(m): 5.5-9.9

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	21.3	4.84	4.4	101.0	0.45	5.00	2.5	19.0	0.000225
4.0	35.6	8.09	4.4	101.0	0.45	5.00	4.5	17.8	0.000211
2.0	21.3	4.84	4.4	101.0	0.45	5.00	2.5	19.0	0.000225

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD6

DEPTH(m): 9.9-14.55

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.9	0.18	4.7	101.0	0.70	4.30	2.5	.7	0.000009
4.0	5.4	1.15	4.7	101.0	0.70	4.30	4.5	2.6	0.000031
6.0	7.1	1.52	4.7	101.0	0.70	4.30	6.5	2.3	0.000028
8.0	10.3	2.22	4.7	101.0	0.70	4.30	8.5	2.6	0.000031
10.0	11.5	2.46	4.7	101.0	0.70	4.30	10.5	2.3	0.000028
8.0	10.1	2.16	4.7	101.0	0.70	4.30	8.5	2.5	0.000031
6.0	6.8	1.46	4.7	101.0	0.70	4.30	6.5	2.2	0.000027
4.0	5.2	1.12	4.7	101.0	0.70	4.30	4.5	2.5	0.000030
2.0	1.7	0.37	4.7	101.0	0.70	4.30	2.5	1.5	0.000018

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD6

DEPTH(m): 14.55-20.20

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.6	0.11	5.7	101.0	0.90	8.20	2.9	.4	0.000005
4.0	4.9	0.86	5.7	101.0	0.90	8.20	4.9	1.7	0.000022
6.0	8.8	1.55	5.7	101.0	0.90	8.20	6.9	2.2	0.000028
8.0	12.2	2.15	5.7	101.0	0.90	8.20	8.9	2.4	0.000030
10.0	14.8	2.62	5.7	101.0	0.90	8.20	10.9	2.4	0.000030
8.0	12.0	2.12	5.7	101.0	0.90	8.20	8.9	2.4	0.000030
6.0	8.1	1.43	5.7	101.0	0.90	8.20	6.9	2.1	0.000026
4.0	4.4	0.78	5.7	101.0	0.90	8.20	4.9	1.6	0.000020
2.0	0.6	0.11	5.7	101.0	0.90	8.20	2.9	.4	0.000005

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD6

DEPTH(m): 20.2-25.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.9	0.35	5.5	101.0	1.30	4.30	2.6	1.4	0.000017
4.0	3.5	0.64	5.5	101.0	1.30	4.30	4.6	1.4	0.000017
6.0	5.2	0.95	5.5	101.0	1.30	4.30	6.6	1.5	0.000018
8.0	6.7	1.22	5.5	101.0	1.30	4.30	8.6	1.4	0.000018
10.0	8.3	1.51	5.5	101.0	1.30	4.30	10.6	1.4	0.000018
8.0	6.4	1.17	5.5	101.0	1.30	4.30	8.6	1.4	0.000017
6.0	5.3	0.96	5.5	101.0	1.30	4.30	6.6	1.5	0.000018
4.0	3.3	0.61	5.5	101.0	1.30	4.30	4.6	1.3	0.000016
2.0	2.0	0.36	5.5	101.0	1.30	4.30	2.6	1.4	0.000017

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD6

DEPTH(m): 25.65-30.10

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.1	0.24	4.5	101.0	0.45	6.90	2.7	.9	0.000010
4.0	2.7	0.60	4.5	101.0	0.45	6.90	4.7	1.3	0.000015
6.0	5.0	1.11	4.5	101.0	0.45	6.90	6.7	1.7	0.000020
8.0	6.6	1.47	4.5	101.0	0.45	6.90	8.7	1.7	0.000020
10.0	9.3	2.08	4.5	101.0	0.45	6.90	10.7	1.9	0.000023
8.0	7.2	1.61	4.5	101.0	0.45	6.90	8.7	1.8	0.000022
6.0	4.2	0.93	4.5	101.0	0.45	6.90	6.7	1.4	0.000016
4.0	2.5	0.56	4.5	101.0	0.45	6.90	4.7	1.2	0.000014
2.0	1.2	0.26	4.5	101.0	0.45	6.90	2.7	.9	0.000011

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD6

DEPTH(m): 30.10-34.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.1	0.24	4.7	101.0	0.60	7.60	2.8	.8	0.000010
4.0	2.1	0.44	4.7	101.0	0.60	7.60	4.8	.9	0.000011
6.0	3.4	0.73	4.7	101.0	0.60	7.60	6.8	1.1	0.000013
8.0	4.7	1.00	4.7	101.0	0.60	7.60	8.8	1.1	0.000014
10.0	6.3	1.35	4.7	101.0	0.60	7.60	10.8	1.3	0.000015
8.0	4.9	1.04	4.7	101.0	0.60	7.60	8.8	1.2	0.000014
6.0	3.5	0.74	4.7	101.0	0.60	7.60	6.8	1.1	0.000013
4.0	2.2	0.46	4.7	101.0	0.60	7.60	4.8	1.0	0.000012
2.0	1.1	0.24	4.7	101.0	0.60	7.60	2.8	.8	0.000010

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD6

DEPTH(m): 34.75-40.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.7	0.28	6.0	101.0	0.50	5.00	2.6	1.1	0.000014
4.0	3.4	0.57	6.0	101.0	0.50	5.00	4.6	1.2	0.000016
6.0	4.6	0.76	6.0	101.0	0.50	5.00	6.6	1.2	0.000015
8.0	6.0	1.00	6.0	101.0	0.50	5.00	8.6	1.2	0.000015
10.0	8.4	1.40	6.0	101.0	0.50	5.00	10.6	1.3	0.000017
8.0	6.3	1.05	6.0	101.0	0.50	5.00	8.6	1.2	0.000016
6.0	4.5	0.74	6.0	101.0	0.50	5.00	6.6	1.1	0.000014
4.0	3.5	0.58	6.0	101.0	0.50	5.00	4.6	1.3	0.000016
2.0	1.9	0.31	6.0	101.0	0.50	5.00	2.6	1.2	0.000015

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD6

DEPTH(m): 40.45-44.95

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.5	101.0	0.90	6.00	2.7	.0	0.000000
4.0	0.9	0.19	4.5	101.0	0.90	6.00	4.7	.4	0.000005
6.0	1.8	0.40	4.5	101.0	0.90	6.00	6.7	.6	0.000007
8.0	3.2	0.70	4.5	101.0	0.90	6.00	8.7	.8	0.000010
10.0	4.8	1.07	4.5	101.0	0.90	6.00	10.7	1.0	0.000012
8.0	3.5	0.77	4.5	101.0	0.90	6.00	8.7	.9	0.000011
6.0	2.1	0.47	4.5	101.0	0.90	6.00	6.7	.7	0.000008
4.0	1.0	0.22	4.5	101.0	0.90	6.00	4.7	.5	0.000006
2.0	0.0	0.00	4.5	101.0	0.90	6.00	2.7	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD6

DEPTH(m): 44.95-50.20

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.3	0.44	5.3	101.0	1.00	14.50	3.6	1.2	0.000015
4.0	3.4	0.64	5.3	101.0	1.00	14.50	5.6	1.1	0.000014
6.0	5.9	1.11	5.3	101.0	1.00	14.50	7.6	1.5	0.000018
8.0	8.2	1.55	5.3	101.0	1.00	14.50	9.6	1.6	0.000020
10.0	11.6	2.21	5.3	101.0	1.00	14.50	11.6	1.9	0.000024
8.0	8.8	1.67	5.3	101.0	1.00	14.50	9.6	1.7	0.000021
6.0	6.2	1.17	5.3	101.0	1.00	14.50	7.6	1.6	0.000019
4.0	3.9	0.74	5.3	101.0	1.00	14.50	5.6	1.3	0.000016
2.0	2.2	0.42	5.3	101.0	1.00	14.50	3.6	1.2	0.000015

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 4.2-8.7

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	16.6	6.49	4.5	101.0	0.40	1.50	2.2	16.8	0.000200
4.0	20.3	7.96	4.5	101.0	0.40	1.50	4.2	10.8	0.000128
6.0	40.7	16.00	4.5	101.0	0.40	1.50	6.2	14.6	0.000174
4.0	20.4	7.98	4.5	101.0	0.40	1.50	4.2	10.8	0.000129
2.0	15.5	6.06	4.5	101.0	0.40	1.50	2.2	15.7	0.000187

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 9.8-15.2

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	4.5	0.82	5.4	86.0	0.60	2.30	2.3	3.6	0.000046
4.0	6.5	1.19	5.4	86.0	0.60	2.30	4.3	2.8	0.000036
6.0	9.3	1.71	5.4	86.0	0.60	2.30	6.3	2.7	0.000035
8.0	12.9	2.39	5.4	86.0	0.60	2.30	8.3	2.9	0.000037
6.0	9.8	1.81	5.4	86.0	0.60	2.30	6.3	2.9	0.000037
4.0	5.4	1.00	5.4	86.0	0.60	2.30	4.3	2.3	0.000030
2.0	4.8	0.89	5.4	86.0	0.60	2.30	2.3	3.9	0.000050

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 15.2-20.65

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	4.3	0.79	5.5	86.0	0.30	2.50	2.3	3.5	0.000044
4.0	6.3	1.15	5.5	86.0	0.30	2.50	4.3	2.7	0.000034
6.0	8.1	1.49	5.5	86.0	0.30	2.50	6.3	2.4	0.000030
8.0	10.0	1.83	5.5	86.0	0.30	2.50	8.3	2.2	0.000028
10.0	12.4	2.28	5.5	86.0	0.30	2.50	10.3	2.2	0.000028
8.0	9.8	1.80	5.5	86.0	0.30	2.50	8.3	2.2	0.000028
6.0	7.7	1.40	5.5	86.0	0.30	2.50	6.3	2.2	0.000029
4.0	6.1	1.11	5.5	86.0	0.30	2.50	4.3	2.6	0.000033
2.0	4.1	0.74	5.5	86.0	0.30	2.50	2.3	3.3	0.000042

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 20.65-25.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.4	0.47	5.1	86.0	0.90	2.40	2.3	2.0	0.000026
4.0	3.8	0.74	5.1	86.0	0.90	2.40	4.3	1.7	0.000022
6.0	5.7	1.11	5.1	86.0	0.90	2.40	6.3	1.8	0.000022
8.0	7.4	1.45	5.1	86.0	0.90	2.40	8.3	1.7	0.000022
10.0	9.8	1.92	5.1	86.0	0.90	2.40	10.3	1.9	0.000024
8.0	7.7	1.50	5.1	86.0	0.90	2.40	8.3	1.8	0.000023
6.0	5.5	1.07	5.1	86.0	0.90	2.40	6.3	1.7	0.000021
4.0	4.1	0.79	5.1	86.0	0.90	2.40	4.3	1.8	0.000023
2.0	2.3	0.45	5.1	86.0	0.90	2.40	2.3	1.9	0.000025

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 25.75-31.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.1	0.40	4.3	86.0	0.20	2.30	2.3	2.2	0.000027
4.0	3.2	0.60	4.3	86.0	0.20	2.30	4.3	1.7	0.000021
6.0	4.3	0.82	4.3	86.0	0.20	2.30	6.3	1.6	0.000020
8.0	6.4	1.21	4.3	86.0	0.20	2.30	8.3	1.8	0.000022
10.0	8.0	1.52	4.3	86.0	0.20	2.30	10.3	1.8	0.000022
8.0	6.3	1.19	4.3	86.0	0.20	2.30	8.3	1.8	0.000022
6.0	4.3	0.81	4.3	86.0	0.20	2.30	6.3	1.6	0.000019
4.0	3.2	0.61	4.3	86.0	0.20	2.30	4.3	1.8	0.000022
2.0	1.7	0.32	4.3	86.0	0.20	2.30	2.3	1.8	0.000022

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 31.7-36.7

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.5	0.09	5.0	86.0	1.20	2.60	2.4	.4	0.000005
4.0	1.6	0.32	5.0	86.0	1.20	2.60	4.4	.7	0.000009
6.0	2.6	0.51	5.0	86.0	1.20	2.60	6.4	.8	0.000010
8.0	4.2	0.83	5.0	86.0	1.20	2.60	8.4	1.0	0.000012
10.0	5.8	1.15	5.0	86.0	1.20	2.60	10.4	1.1	0.000014
8.0	4.4	0.87	5.0	86.0	1.20	2.60	8.4	1.0	0.000013
6.0	2.7	0.54	5.0	86.0	1.20	2.60	6.4	.8	0.000011
4.0	1.6	0.32	5.0	86.0	1.20	2.60	4.4	.7	0.000009
2.0	0.8	0.16	5.0	86.0	1.20	2.60	2.4	.7	0.000008

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 36.7-41.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.1	86.0	1.65	2.65	2.4	.0	0.000000
4.0	0.5	0.09	5.1	86.0	1.65	2.65	4.4	.2	0.000003
6.0	1.0	0.21	5.1	86.0	1.65	2.65	6.4	.3	0.000004
8.0	2.4	0.48	5.1	86.0	1.65	2.65	8.4	.6	0.000007
10.0	3.8	0.75	5.1	86.0	1.65	2.65	10.4	.7	0.000009
8.0	2.9	0.57	5.1	86.0	1.65	2.65	8.4	.7	0.000009
6.0	1.1	0.21	5.1	86.0	1.65	2.65	6.4	.3	0.000004
4.0	0.6	0.11	5.1	86.0	1.65	2.65	4.4	.2	0.000003
2.0	0.0	0.00	5.1	86.0	1.65	2.65	2.4	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 41.75-46.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.8	1.55	5.0	86.0	1.20	2.55	2.4	2.3	0.000029
4.0	4.5	0.90	5.0	86.0	1.20	2.55	4.4	2.1	0.000026
6.0	6.4	1.28	5.0	86.0	1.20	2.55	6.4	2.0	0.000025
8.0	8.4	1.68	5.0	86.0	1.20	2.55	8.4	2.0	0.000025
10.0	11.7	2.33	5.0	86.0	1.20	2.55	10.4	2.2	0.000028
8.0	8.5	1.70	5.0	86.0	1.20	2.55	8.4	2.0	0.000026
6.0	6.3	1.25	5.0	86.0	1.20	2.55	6.4	2.0	0.000025
4.0	4.5	0.89	5.0	86.0	1.20	2.55	4.4	2.0	0.000026
2.0	2.6	0.52	5.0	86.0	1.20	2.55	2.4	2.2	0.000028

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 44.95-50.90

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.3	0.80	4.2	86.0	0.75	2.70	2.3	3.4	0.000041
4.0	5.2	1.24	4.2	86.0	0.75	2.70	4.3	2.9	0.000035
6.0	8.4	2.01	4.2	86.0	0.75	2.70	6.3	3.2	0.000038
8.0	12.7	3.06	4.2	86.0	0.75	2.70	8.3	3.7	0.000044
10.0	15.6	3.75	4.2	86.0	0.75	2.70	10.3	3.6	0.000044
8.0	12.0	2.89	4.2	86.0	0.75	2.70	8.3	3.5	0.000042
6.0	8.2	2.06	4.2	86.0	0.75	2.70	6.3	3.1	0.000038
4.0	5.8	1.40	4.2	86.0	0.75	2.70	4.3	3.2	0.000039
2.0	4.3	1.02	4.2	86.0	0.75	2.70	2.3	4.4	0.000053

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 51.90-56.20

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	2.0	0.45	4.3	76.0	0.00	2.40	2.2	2.0	0.000025
4.0	3.5	0.81	4.3	76.0	0.00	2.40	4.2	1.9	0.000024
6.0	5.7	1.33	4.3	76.0	0.00	2.40	6.2	2.1	0.000027
8.0	18.8	4.36	4.3	76.0	0.00	2.40	8.2	5.3	0.000066
10.0	15.6	3.62	4.3	76.0	0.00	2.40	10.2	3.5	0.000044
8.0	9.5	2.20	4.3	76.0	0.00	2.40	8.2	2.7	0.000033
6.0	5.6	1.29	4.3	76.0	0.00	2.40	6.2	2.1	0.000026
4.0	3.4	0.78	4.3	76.0	0.00	2.40	4.2	1.8	0.000023
2.0	2.2	0.51	4.3	76.0	0.00	2.40	2.2	2.3	0.000029

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 56.20-61.45

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	5.6	1.07	5.3	76.0	0.40	2.65	2.3	4.6	0.000060
4.0	8.8	1.68	5.3	76.0	0.40	2.65	4.3	3.9	0.000051
6.0	12.6	2.39	5.3	76.0	0.40	2.65	6.3	3.8	0.000050
8.0	20.5	3.90	5.3	76.0	0.40	2.65	8.3	4.7	0.000061
10.0	26.8	5.10	5.3	76.0	0.40	2.65	10.3	5.0	0.000065
8.0	19.5	3.71	5.3	76.0	0.40	2.65	8.3	4.5	0.000058
6.0	12.5	2.37	5.3	76.0	0.40	2.65	6.3	3.8	0.000049
4.0	8.3	1.58	5.3	76.0	0.40	2.65	4.3	3.7	0.000048
2.0	5.5	1.05	5.3	76.0	0.40	2.65	2.3	4.5	0.000059

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 61.45-66.25

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.9	0.18	4.8	76.0	1.25	2.55	2.4	.7	0.000010
4.0	2.0	0.42	4.8	76.0	1.25	2.55	4.4	1.0	0.000012
6.0	3.2	0.67	4.8	76.0	1.25	2.55	6.4	1.0	0.000013
8.0	5.0	1.03	4.8	76.0	1.25	2.55	8.4	1.2	0.000016
10.0	8.1	1.68	4.8	76.0	1.25	2.55	10.4	1.6	0.000021
8.0	5.2	1.07	4.8	76.0	1.25	2.55	8.4	1.3	0.000016
6.0	3.0	0.63	4.8	76.0	1.25	2.55	6.4	1.0	0.000013
4.0	2.2	0.45	4.8	76.0	1.25	2.55	4.4	1.0	0.000013
2.0	1.0	0.21	4.8	76.0	1.25	2.55	2.4	.9	0.000011

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 66.25-71.60

GAUGE PRESS.	INJECTION Q'ty		TEST LENGTH	HOLE DIA.	GAUGE HEIGHT	WATER LEVEL	TEST PRESS.	LUGEON VALUE	k-VALUE
kg/cm2	lit/min	lit/min/m	m	mm	m	m	kg/cm2		cm/sec
2.0	1.5	0.28	5.4	76.0	1.05	2.40	2.3	1.2	0.000016
4.0	2.5	0.47	5.4	76.0	1.05	2.40	4.3	1.1	0.000014
6.0	3.7	0.68	5.4	76.0	1.05	2.40	6.3	1.1	0.000014
8.0	5.5	1.03	5.4	76.0	1.05	2.40	8.3	1.2	0.000016
10.0	7.7	1.43	5.4	76.0	1.05	2.40	10.3	1.4	0.000018
8.0	5.5	1.02	5.4	76.0	1.05	2.40	8.3	1.2	0.000016
6.0	3.5	0.64	5.4	76.0	1.05	2.40	6.3	1.0	0.000013
4.0	2.3	0.42	5.4	76.0	1.05	2.40	4.3	1.0	0.000013
2.0	1.0	0.19	5.4	76.0	1.05	2.40	2.3	.8	0.000010

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 71.60-76.60

GAUGE PRESS.	INJECTION Q'ty		TEST LENGTH	HOLE DIA.	GAUGE HEIGHT	WATER LEVEL	TEST PRESS.	LUGEON VALUE	k-VALUE
kg/cm2	lit/min	lit/min/m	m	mm	m	m	kg/cm2		cm/sec
2.0	1.2	0.24	5.0	76.0	0.25	2.40	2.3	1.1	0.000014
4.0	2.4	0.47	5.0	76.0	0.25	2.40	4.3	1.1	0.000014
6.0	3.3	0.65	5.0	76.0	0.25	2.40	6.3	1.0	0.000013
8.0	4.6	0.92	5.0	76.0	0.25	2.40	8.3	1.1	0.000014
10.0	6.4	1.27	5.0	76.0	0.25	2.40	10.3	1.2	0.000016
8.0	4.7	0.94	5.0	76.0	0.25	2.40	8.3	1.1	0.000015
6.0	3.0	0.60	5.0	76.0	0.25	2.40	6.3	1.0	0.000012
4.0	2.1	0.42	5.0	76.0	0.25	2.40	4.3	1.0	0.000013
2.0	0.7	0.13	5.0	76.0	0.25	2.40	2.3	.6	0.000007

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD7 45

DEPTH(m): 76.6-80.95

GAUGE PRESS.	INJECTION Q'ty		TEST LENGTH	HOLE DIA.	GAUGE HEIGHT	WATER LEVEL	TEST PRESS.	LUGEON VALUE	k-VALUE
kg/cm2	lit/min	lit/min/m	m	mm	m	m	kg/cm2		cm/sec
2.0	0.0	0.00	4.4	76.0	1.35	2.50	2.4	.0	0.000000
4.0	0.5	0.11	4.4	76.0	1.35	2.50	4.4	.3	0.000003
6.0	1.1	0.25	4.4	76.0	1.35	2.50	6.4	.4	0.000005
8.0	2.1	0.48	4.4	76.0	1.35	2.50	8.4	.6	0.000007
10.0	3.1	0.71	4.4	76.0	1.35	2.50	10.4	.7	0.000009
8.0	2.2	0.49	4.4	76.0	1.35	2.50	8.4	.6	0.000007
6.0	1.1	0.25	4.4	76.0	1.35	2.50	6.4	.4	0.000005
4.0	0.7	0.15	4.4	76.0	1.35	2.50	4.4	.3	0.000004
2.0	0.0	0.00	4.4	76.0	1.35	2.50	2.4	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST　　HOLE NO. BD8

DEPTH(m): 6.6

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	1.3	13.00	0.0	146.0	0.40	1.00	.1	100<	0.001927

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST　　HOLE NO. BD8

DEPTH(m): 11.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	1.2	11.75	0.0	146.0	0.70	2.50	.3	100<	0.000762

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST　　HOLE NO. BD8

DEPTH(m): 16.7

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	1.3	13.00	0.0	86.0	0.30	2.50	.3	100<	0.001636

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST　　HOLE NO. BD8

DEPTH(m): 20.6-26.15

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	11.2	2.01	5.6	76.0	0.95	3.50	2.3	8.7	0.000115
4.0	14.9	2.68	5.6	76.0	0.95	3.50	4.3	6.2	0.000082
6.0	20.9	3.76	5.6	76.0	0.95	3.50	6.3	6.0	0.000079
8.0	24.9	4.48	5.6	76.0	0.95	3.50	8.3	5.4	0.000071
10.0	28.9	5.21	5.6	76.0	0.95	3.50	10.3	5.1	0.000067
8.0	24.3	4.37	5.6	76.0	0.95	3.50	8.3	5.3	0.000070
6.0	20.2	3.64	5.6	76.0	0.95	3.50	6.3	5.8	0.000076
4.0	15.1	2.72	5.6	76.0	0.95	3.50	4.3	6.3	0.000084
2.0	10.9	1.96	5.6	76.0	0.95	3.50	2.3	8.5	0.000113

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY　　Hf(kg/cm2) 0.1

RECORD OF WATER PRESSURE TEST HOLE NO. BD8

DEPTH(m): 26.15-32.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	8.2	1.39	5.9	76.0	1.60	3.00	2.5	5.7	0.000076
4.0	10.1	1.72	5.9	76.0	1.60	3.00	4.5	3.9	0.000051
6.0	11.8	2.01	5.9	76.0	1.60	3.00	6.5	3.1	0.000042
8.0	14.9	2.54	5.9	76.0	1.60	3.00	8.5	3.0	0.000040
10.0	17.4	2.97	5.9	76.0	1.60	3.00	10.5	2.8	0.000038
8.0	13.9	2.37	5.9	76.0	1.60	3.00	8.5	2.8	0.000037
6.0	12.1	2.07	5.9	76.0	1.60	3.00	6.5	3.2	0.000043
4.0	10.3	1.76	5.9	76.0	1.60	3.00	4.5	3.9	0.000053
2.0	8.1	1.38	5.9	76.0	1.60	3.00	2.5	5.6	0.000075

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD8

DEPTH(m): 32.0-36.75

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.2	0.66	4.8	76.0	1.75	3.50	2.5	2.6	0.000034
4.0	5.1	1.06	4.8	76.0	1.75	3.50	4.5	2.3	0.000030
6.0	6.5	1.36	4.8	76.0	1.75	3.50	6.5	2.1	0.000027
8.0	8.1	1.71	4.8	76.0	1.75	3.50	8.5	2.0	0.000026
10.0	10.2	2.15	4.8	76.0	1.75	3.50	10.5	2.0	0.000026
8.0	7.8	1.64	4.8	76.0	1.75	3.50	8.5	1.9	0.000025
6.0	6.2	1.29	4.8	76.0	1.75	3.50	6.5	2.0	0.000025
4.0	4.8	1.01	4.8	76.0	1.75	3.50	4.5	2.2	0.000029
2.0	3.2	0.67	4.8	76.0	1.75	3.50	2.5	2.7	0.000034

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BD8

DEPTH(m): 37.75-40.35

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	3.2	1.23	2.6	66.0	1.10	3.90	2.5	4.9	0.000057
4.0	5.3	2.02	2.6	66.0	1.10	3.90	4.5	4.5	0.000052
6.0	7.8	2.98	2.6	66.0	1.10	3.90	6.5	4.6	0.000053
8.0	10.2	3.90	2.6	66.0	1.10	3.90	8.5	4.6	0.000053
10.0	12.5	4.79	2.6	66.0	1.10	3.90	10.5	4.6	0.000053
8.0	10.2	3.92	2.6	66.0	1.10	3.90	8.5	4.6	0.000053
6.0	7.8	2.98	2.6	66.0	1.10	3.90	6.5	4.6	0.000053
4.0	5.4	2.06	2.6	66.0	1.10	3.90	4.5	4.6	0.000053
2.0	3.2	1.23	2.6	66.0	1.10	3.90	2.5	4.9	0.000057

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS1

DEPTH(m): 5.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.3	3.25	0.1	150.0	1.00	5.00	.6	54.2	0.000109

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS1

DEPTH(m): 8.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.1	1.25	0.1	143.0	0.70	5.70	.6	19.5	0.000041

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS1

DEPTH(m): 10.1-15.2

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	4.2	0.82	5.1	101.0	0.30	3.00	2.3	3.5	0.000043
4.0	8.0	1.56	5.1	101.0	0.30	3.00	4.3	3.6	0.000044
6.0	14.3	2.80	5.1	101.0	0.30	3.00	6.3	4.4	0.000054
4.0	8.8	1.72	5.1	101.0	0.30	3.00	4.3	4.0	0.000049
2.0	5.8	1.13	5.1	101.0	0.30	3.00	2.3	4.8	0.000059

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS1

DEPTH(m): 20.6-26.15

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.1	76.0	0.60	6.20	2.7	.0	0.000000
4.0	0.0	0.00	5.1	76.0	0.60	6.20	4.7	.0	0.000000
6.0	0.0	0.00	5.1	76.0	0.60	6.20	6.7	.0	0.000000
8.0	0.0	0.00	5.1	76.0	0.60	6.20	8.7	.0	0.000000
10.0	0.0	0.00	5.1	76.0	0.60	6.20	10.7	.0	0.000000

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS1

DEPTH(m): 21.30-25.8

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.5	76.0	1.60	4.25	2.6	.0	0.000000
4.0	0.0	0.00	4.5	76.0	1.60	4.25	4.6	.0	0.000000
6.0	0.0	0.00	4.5	76.0	1.60	4.25	6.6	.0	0.000000
8.0	0.0	0.00	4.5	76.0	1.60	4.25	8.6	.0	0.000000
10.0	0.0	0.00	4.5	76.0	1.60	4.25	10.6	.0	0.000000

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS1

DEPTH(m): 25.8-30.25

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.5	76.0	0.00	8.00	2.8	.0	0.000000
4.0	0.0	0.00	4.5	76.0	0.00	8.00	4.8	.0	0.000000
6.0	0.0	0.00	4.5	76.0	0.00	8.00	6.8	.0	0.000000
8.0	0.0	0.00	4.5	76.0	0.00	8.00	8.8	.0	0.000000
10.0	0.0	0.00	4.5	76.0	0.00	8.00	10.8	.0	0.000000

AVERAGE
k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS2

DEPTH(m): 5.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.3	2.50	0.0	150.0	1.00	5.00	.6	41.7	0.000084

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS2

DEPTH(m): 8.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.2	1.75	0.0	150.0	0.75	8.25	.9	19.4	0.000039

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS2

DEPTH(m): 14.3

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.2	1.75	0.1	143.0	0.70	3.80	.5	38.9	0.000082

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS2

DEPTH(m): 16.40-21.40

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.0	86.0	0.40	6.65	2.7	.0	0.000000
4.0	0.0	0.00	5.0	86.0	0.40	6.65	4.7	.0	0.000000
6.0	0.0	0.00	5.0	86.0	0.40	6.65	6.7	.0	0.000000
8.0	0.0	0.00	5.0	86.0	0.40	6.65	8.7	.0	0.000000
10.0	0.0	0.00	5.0	86.0	0.40	6.65	10.7	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF CONSTANT HEAD TEST HOLE NO. BS2

DEPTH(m): 24.9

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.1	0.50	0.1	86.0	0.60	4.10	.5	10.6	0.000037

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS2

DEPTH(m): 25.9-30.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.1	76.0	1.05	7.70	2.9	.0	0.000000
4.0	0.0	0.00	4.1	76.0	1.05	7.70	4.9	.0	0.000000
6.0	0.0	0.00	4.1	76.0	1.05	7.70	6.9	.0	0.000000
8.0	0.0	0.00	4.1	76.0	1.05	7.70	8.9	.0	0.000000
10.0	0.0	0.00	4.1	76.0	1.05	7.70	10.9	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS2

DEPTH(m): 30.0-35.25

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.3	76.0	0.55	9.70	3.0	.0	0.000000
4.0	0.0	0.00	5.3	76.0	0.55	9.70	5.0	.0	0.000000
6.0	0.0	0.00	5.3	76.0	0.55	9.70	7.0	.0	0.000000
8.0	0.0	0.00	5.3	76.0	0.55	9.70	9.0	.0	0.000000
10.0	0.0	0.00	5.3	76.0	0.55	9.70	11.0	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS3

DEPTH(m): 5.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.1	1.25	0.1	150.0	1.00	5.00	.6	20.8	0.000042

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

CONSTANT HEAD TEST HOLE NO. BS3

DEPTH(m): 5-8.95

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
0.0	0.0	0.01	4.0	113.0	0.05	3.00	.3	.2	0.000022

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS3

DEPTH(m): 10-14.95

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	1.4	0.29	5.0	80.0	0.70	4.20	2.5	1.2	0.000015
4.0	5.9	1.18	5.0	80.0	0.70	4.20	4.5	2.6	0.000034
6.0	7.2	1.44	5.0	80.0	0.70	4.20	6.5	2.2	0.000028
8.0	10.2	2.06	5.0	80.0	0.70	4.20	8.5	2.4	0.000031
10.0	12.0	2.42	5.0	80.0	0.70	4.20	10.5	2.3	0.000030
8.0	9.5	1.91	5.0	80.0	0.70	4.20	8.5	2.2	0.000029
6.0	7.1	1.43	5.0	80.0	0.70	4.20	6.5	2.2	0.000028
4.0	5.4	1.09	5.0	80.0	0.70	4.20	4.5	2.4	0.000031
2.0	3.9	0.79	5.0	80.0	0.70	4.20	2.5	3.2	0.000040

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS3

DEPTH(m): 14.95-20.15

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.2	76.0	0.35	4.50	2.5	.0	0.000000
4.0	0.0	0.00	5.2	76.0	0.35	4.50	4.5	.0	0.000000
6.0	0.0	0.00	5.2	76.0	0.35	4.50	6.5	.0	0.000000
8.0	0.5	0.01	5.2	76.0	0.35	4.50	8.5	.1	0.000001
10.0	1.0	0.02	5.2	76.0	0.35	4.50	10.5	.2	0.000002
8.0	0.5	0.01	5.2	76.0	0.35	4.50	8.5	.1	0.000001
6.0	0.0	0.00	5.2	76.0	0.35	4.50	6.5	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS3

DEPTH(m): 20.15-25.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.9	76.0	1.25	5.30	2.7	.0	0.000000
4.0	0.0	0.00	4.9	76.0	1.25	5.30	4.7	.0	0.000000
6.0	0.0	0.00	4.9	76.0	1.25	5.30	6.7	.0	0.000000
8.0	0.2	0.04	4.9	76.0	1.25	5.30	8.7	.0	0.000001
10.0	0.4	0.09	4.9	76.0	1.25	5.30	10.7	.1	0.000001
8.0	0.2	0.04	4.9	76.0	1.25	5.30	8.7	.0	0.000001
6.0	0.0	0.00	4.9	76.0	1.25	5.30	6.7	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS3

DEPTH(m): 25.9-30.0

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	5.5	76.0	1.10	8.10	2.9	.0	0.000000
4.0	0.0	0.00	5.5	76.0	1.10	8.10	4.9	.0	0.000000
6.0	0.0	0.00	5.5	76.0	1.10	8.10	6.9	.0	0.000000
8.0	0.3	0.05	5.5	76.0	1.10	8.10	8.9	.1	0.000001
10.0	0.5	0.08	5.5	76.0	1.10	8.10	10.9	.1	0.000001
8.0	0.3	0.05	5.5	76.0	1.10	8.10	8.9	.1	0.000001
6.0	0.0	0.00	5.5	76.0	1.10	8.10	6.9	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

RECORD OF WATER PRESSURE TEST HOLE NO. BS3

DEPTH(m): 30.45-35.10

GAUGE PRESS. kg/cm2	INJECTION Q'ty lit/min	lit/min/m	TEST LENGTH m	HOLE DIA. mm	GAUGE HEIGHT m	WATER LEVEL m	TEST PRESS. kg/cm2	LUGEON VALUE	k-VALUE cm/sec
2.0	0.0	0.00	4.7	76.0	0.30	8.10	2.8	.0	0.000000
4.0	0.0	0.00	4.7	76.0	0.30	8.10	4.8	.0	0.000000
6.0	0.2	0.04	4.7	76.0	0.30	8.10	6.8	.1	0.000001
8.0	0.7	0.14	4.7	76.0	0.30	8.10	8.8	.2	0.000002
10.0	1.3	0.28	4.7	76.0	0.30	8.10	10.8	.3	0.000003
8.0	0.7	0.16	4.7	76.0	0.30	8.10	8.8	.2	0.000002
6.0	0.2	0.04	4.7	76.0	0.30	8.10	6.8	.1	0.000001
4.0	0.0	0.00	4.7	76.0	0.30	8.10	4.8	.0	0.000000

AVERAGE

k-VALUE: COEFFICIENT OF PERMEABILITY

II.5 Laboratory Test

SUMMARY OF SOIL TEST
(RELEVÉ DES ESSAIS DES SOLS)

FOR REPORTING (POUR DE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ): MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT

SAMPLE NO. (N°DE L'ÉCHANTILLON)			TPL-1				
SAMPLE DEPTH (PROFONDEUR DE L'ÉCHANTILLON)		(m)	~	~	~	~	~
GRADATION (GRANULOMÉTRIE)	GRAVEL (GRAVIER)	(%)	8				
	SAND (SABLE)	(%)	29				
	SILT (SLT)	(%)	34				
	CLAY (ARGILE)	(%)	29				
	MAX. DIAMETER (DIAMÈTRE MAX.)	(mm)	19.1				
	COEFFICIENT OF UNIFORMITY (COEFFICIENT D'UNIFORMITÉ)	Uc	—				
	COEFFICIENT OF CURVATURE (COEFFICIENT DE COURBURE)	U'c	—				
CONSISTENCY (CONSISTANCE)	LIQUID LIMIT (LIMITE DE LIQUIDITÉ)	w_L (%)	52.0				
	PLASTIC LIMIT (LIMITE DE PLASTICITÉ)	w_P (%)	26.3				
	PLASTICITY INDEX (INDICE DE PLASTICITÉ)	Ip	25.7				
*	Shrinkage limit		18.6				
SPECIFIC GRAVITY OF SOIL (POIDS SPÉCIFIQUE DU SOL)		Gs	2.771				
NATURAL STATE (ETAT NATURAL)	WATER CONTENT (TENEUR EN EAU)	w (%)	27.29				
	WET DENSITY (DENSITÉ HUMIDE)	γ_t (g/m³)					
	VOID RATIO (INDICE DES VIDES)	e					
	DEGREE OF SATURATION (DEGRÉ DE SATURATION)	Sr (%)					
MECHANICAL PROPERTIES (PROPRITÉS MÉCANIQUES) UNCONFINED COMPRESSION (COMPRESSION UNIAXE)	COMPRESSIVE STRENGTH (RÉSISTANCE À LA COMPRESSION)	q_u (kg/cm²)					
	MODULUS OF ELASTICITY (MODULE D'ÉLASITICITÉ)	E_{50} (kg/cm²)					
	SENSITIVITY RATIO (INDICE DE SENSITIVITÉ)	St					
** (1) (2)	TYPE OF TEST (TYPE DE L'ESSAI) ***		UU.				
	COHESION (COHÉSION)	C_{uu} (kg/cm²)	0.22 (1.38)	Normally Consolidation	(Over Consolidation)		
	ANGLE OF INTERNAL FRICTION (ANGLE DE FROTTEMENT INTERNE)	ϕ_{uu} (°)	16.1 10.2)				
CONSOLIDATON (CONSOLIDATION)	YIELD STRESS OF CONSOLIDATION (LIMITE D'ÉLASTITÉ DE CONSOLIDATION)	Py (kg/cm²)					
	COMPRESSION INDEX (INDICE DE COMPRESSION)	Cc	0.19				

* CLASSIFICATION (CLASSIFICATION)
** (1): DIRECT SHEAR (CISAILLEMENT), (2): TRIAXIAL COMPRESSION (COMPRESSION TRIAXIAL)
*** UNCONSOLIDATED, UNDRAINED (NON CONSOLIDÉ, NON DRAINÉ): UU; CONSOLIDATED, UNDRAINED (CONSOLIDÉ, NON DRAINÉ): CU; CONSOLIDATED, DRAINED (CONSOLIDÉ DRAINÉ): CD.

(BAR OVER THE SYMBOL SHOWS THE MEASUREMENT OF PORE WATER PRESSURE (LE TRAIT AU DESSUS DU SYMBOL MONTRE LA PRESSION DE L'EAU INTERSTITIELLE.))

N. K. FORM NO. 015 (1975)

SPECIFIC GRAVITY OF SOIL

SPECIFIC GRAVITY TEST

No.

MAGWAGWA HYDROELECTRIC POWER
LOCATION DEVELOPMENT PROJECT DATE

SAMPLE NO. TPL-1 TESTED BY

Determination NO.		1	2	3	4
No. of Pycnometer		29	30	51	
Wt. of Pycnometer W_f in g		46.122	43.185	51.978	
Wt. (Pycnometer + water) W'_a in g		146.301	146.007	150.112	
Temperature of calibration (corresponding with W'_a) T' °C		20	20	20	
Wt. (Pycnometer + soil + water) W_b in g		154.837	153.757	159.502	
Temperature of Calibration (corresponding to W_b) T °C		16	16	16	
Weight of dry Soil W_0	No. of Container	29	30	51	
	Wt. (Container + dry soil) in g	53.728	49.360	60.942	
	Wt. Container in g	40.500	37.346	46.369	
	W_0 in g	13.228	12.014	14.573	
Deflocculating agent and its amount		———	———	———	
*Wt. (Pycnometer + water) calculated for T°C W_a in g		146.375	146.083	150.185	
$W_0+(W_a-W_b)$ in g		4.766	4.340	5.256	
Deflocculant correction					
$W_0+(W_a-W_b)$ corrected					
Specific Gravity at T°C $G_{(T°C)}=\frac{W_0}{W_0+(W_a-W_b)}$		2.775	2.768	2.773	
Coefficient for temperature correction K		0.9998	0.9998	0.9998	
Specific Gravity at 15°C $G_{(15°C)}=K\times G_{(T°C)}$		2.774	2.767	2.772	
Mean value		Specific gravity (15°C) = 2.771			

*"W_a" is determined from the diagram peculiar to each pycnometer.

Remarks:

N.K. Form No. 3132

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·WATER CONTENT

WATER CONTENT OF SOIL

LOCATION MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT DATE

SAMPLE NO. TESTED BY

Sample No.	Calculation			Mean water content %
No. TPL-1 m ~ m	No. W_a 15.44 W_b W_b 12.05 W_c W_w W_s w= 28.13 %	No. W_a 17.77 W_b W_b 14.05 W_c W_w W_s w= 2648 %	No. W_a 19.04 W_b W_b 14.96 W_c W_w W_s w= 27.27 %	w= 2729 %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %
No. m ~ m	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	No. W_a W_b W_b W_c W_w W_s w= %	w= %

Remarks:

GRADATION

GRADATION ANALYSIS
(ANALYSE GRANULOMÉTRIQUE)

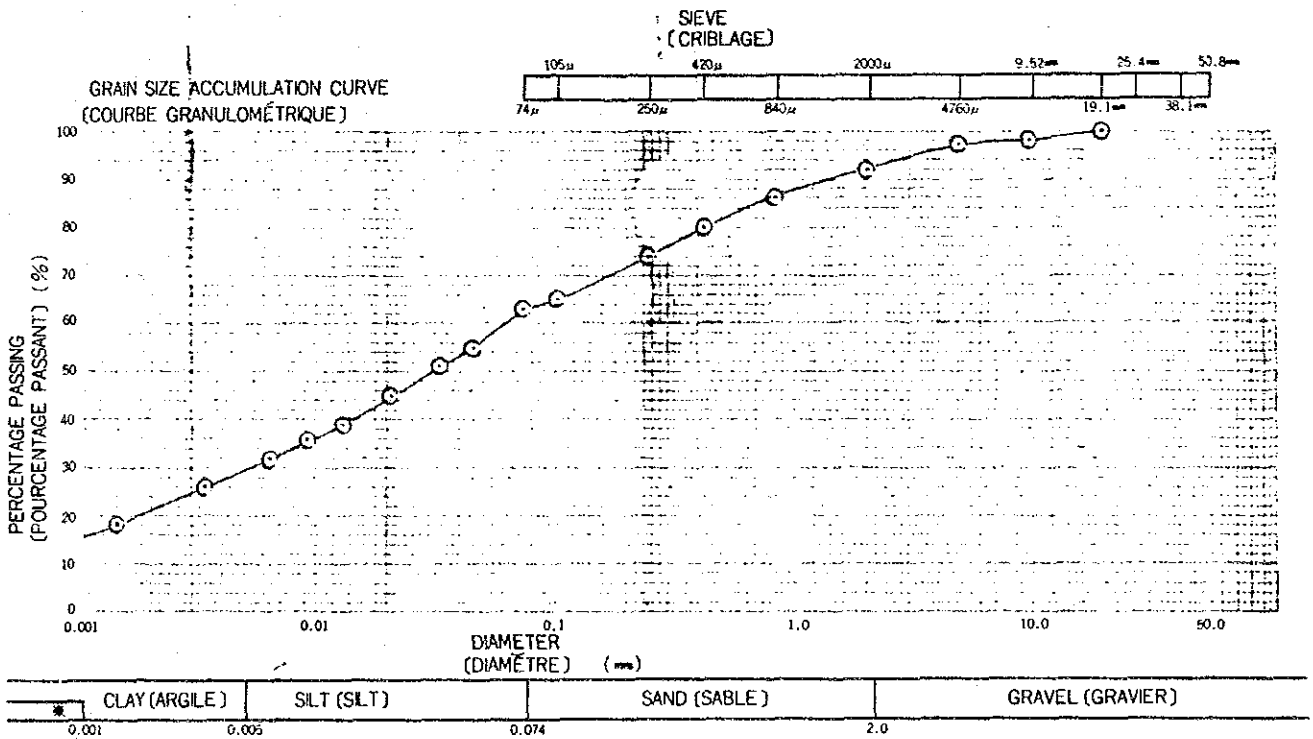
FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	
SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TPL-1 (m ~ m)	TESTED BY (ESSAI PAR)	

PARTICLE SIZE & WEIGHT PERCENTAGE OF PARTICLES UNDER THE SIZE
(DIMENSION DES PARTICULES ET POURCENTAGE DE POIDS DES PARTICULES DE DIMENSION INFÉRIEURE AUX PRÉCÉDENTES)

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) Gs 2.771

SIEVE (CRIBLAGE)	GRAIN SIZE (mm) (GRANUROMÉTRIE)	50.8	38.1	25.4	19.1	9.52	4.76	2.00	0.84	0.42	0.25	0.105	0.074
	TOTAL PASSING(%) (TOTAL PASSANT)				100	98.4	96.5	91.6	86.2	79.8	73.6	64.9	62.8
HYDROMETER (ARÉOMÉTRIE)	GRAIN SIZE(mm) (GRANULOMÉTRIE)	00455	00328	00213	00127	00091	00065	00034	00014				
	TOTAL PASSING(%) (TOTAL PASSANT)	55.3	50.8	45.4	38.9	35.5	32.1	25.5	18.4				



✱ COLLOID
(COLLOÏDE)

PROPORTION (PROPORTION)					
4.76mm<	3 %	MAXMUM DIAMETER (DIAMÈTRE MAXIMUM)	19.1 mm
4.76~2.00mm	5 %	60% DIAMETER (DIAMÈTRE 60%)	0.063 mm
2.00~0.42mm	12 %	30% DIAMETER (DIAMÈTRE 30%)	0.0053 mm
0.42~0.074mm	17 %	10% DIAMETER (DIAMÈTRE 10%)	— mm
0.074~0.005mm	34 %	COEFFICIENT OF UNIFORMITY (COEFFICIENT D'UNIFORMITÉ)	—
0.005mm>	29 %	COEFFICIENT OF CURVATURE (COEFFICIENT DE COURBURE)	—

N. K. FORM NO. 002 (1975)

CONSISTENCY

LIQUID LIMIT & PLASTIC LIMIT TEST
(ESSAI DE LIMITE DE LIQUIDITÉ ET DE LIMITE DE PLASTICITÉ)

FOR REPORTING
(POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT		
DATE (DATE)		TESTED BY (ESSAI PAR)	

SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	No. TPL-1 (m ~ m)

LIQUID LIMIT TEST (LIMITE DE LIQUIDITÉ)			PLASTIC LIMIT TEST (LIMITE DE PLASTICITÉ)	
TEST. NO (N° DE L'ESSAI)	NO OF BLOWS (NOMBRE DE COUP)	WATER CONTENT (TENEUR EN EAU)	TEST. NO. (N° DE L'ESSAI)	WATER CONTENT (TENEUR EN EAU)
1	35	50.4 %	1	26.4 %
2	30	51.2 %	2	26.2 %
3	25	52.0 %	3	26.2 %
4	19	53.7 %		
5	15	54.6 %		
6	9	57.5 %	MEAN VALUE (VALEUR MOYENNE)	26.3

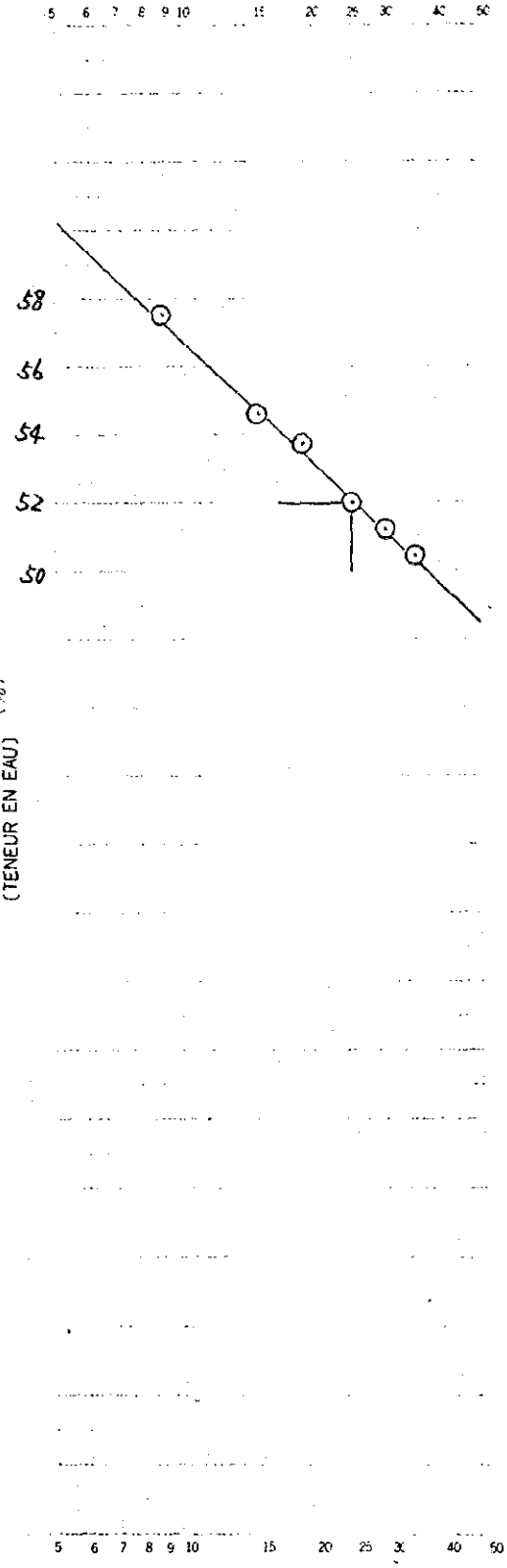
LIQUID LIMIT (LIMITE DE LIQUIDITÉ)	PLASTIC LIMIT (LIMITE DE PLASTICITÉ)	PLASTICITY INDEX (INDICE DE PLASTICITÉ)
w_L 52.0 %	w_P 26.3 %	I_P 25.7

SAMPLE NO. & DEPTH (N° DE L ÉCHANTILLON ET PROFONDEUR)	No. (m ~ m)

LIQUID LIMIT TEST (LIMITE DE LIQUIDITÉ)			PLASTIC LIMIT TEST (LIMITE DE PLASTICITÉ)	
TEST. NO (N° DE L'ESSAI)	NO. OF BLOWS (NOMBRE DE COUP)	WATER CONTENT (TENEUR EN EAU)	TEST. NO (N° DE L'ESSAI)	WATER CONTENT (TENEUR EN EAU)
1		%	1	%
2		%	2	%
3		%	3	%
4		%		
5		%		
6		%	MEAN VALUE (VALEUR MOYENNE)	

LIQUID LIMIT (LIMITE DE LIQUIDITÉ)	PLASTIC LIMIT (LIMITE DE PLASTICITÉ)	PLASTICITY INDEX (INDICE DE PLASTICITÉ)
w_L %	w_P %	I_P

FLOW CURVE
(COURBE DE DÉTERMINATION DE LA LIMITE DE LIQUIDITÉ)



SHRINKAGE CONSTANT TEST

No.

LOCATION MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT, Date

SAMPLE No. TPL-1, Test by

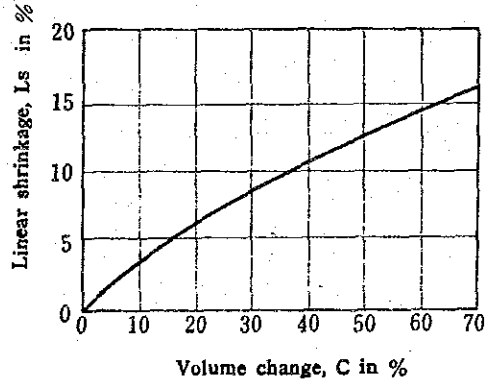
	No. 1	No. 2	No. 3
WW	41.13	42.72	43.55
DW			
DW	31.68	32.65	33.50
TW	12.98	12.82	13.69
W_w	9.45	10.07	10.05
W_s	18.70	19.83	19.81
w =	50.53 %	50.78 %	50.73 %

	SPECIMEN No.	1	2	3
SHRINKAGE LIMIT	Wet soil volume (Volume of mercury filled in dish) V cm³	16.5	17.5	17.5
	Dry soil volume (Volume of mercury overflown) Vo cm³	10.5	11.2	11.1
	Shrinkage volume (V−Vo) cm³	6.0	6.3	6.4
	$\frac{V-Vo}{Ws}\gamma_w\times 100\%$	32.1	31.8	32.3
	Shrinkage limit $S=w-\left(\frac{V-Vo}{Ws}\gamma_w\times 100\right)\%$	18.4	19.0	18.4
	$\frac{1}{R}-\frac{1}{G}$	0.201	0.204	0.201
	Shrinkage limit obtained from R & G $w_s=\left(\frac{1}{R}-\frac{1}{G}\right)\times 100\%$	20.1	20.4	20.1
SHRINKAGE RATIO	Dry soil volume Vo cm³	10.5	11.2	11.1
	Dry Soil weight Ws g	18.7	19.8	19.8
	Shrinkage ratio $R=\frac{Ws}{Vo}\cdot\frac{1}{\gamma_w}$	1.78	1.77	1.78
VOLUME CHANGE	Inital water content w_1 %	27.3	27.3	27.3
	Shrinkage limit w_s %	18.4	19.0	18.4
	Volume change $C=(w_1-w_s)R$	15.8	14.7	15.8
Liner Shrinkage	$Ls=100\left(1-\sqrt[3]{\frac{100}{C+100}}\right)\%$	4.8	4.5	4.8
SPECIFIC GRAVITY OF SOIL	$\frac{1}{R}-\frac{w_s}{100}$	0.378	0.375	0.378
	Specific gravity of soil $G=\frac{1}{1/R-w_s/100}$	2.646	2.667	2.646
	Specific gravity of soil obtained by pycnometer method	2.771	2.771	2.771

[Remarks] γ_w : Unit weight of water

ある含水比は自然含水比を使用

Curve for determining linear shrinkage



Note : Test is made on soil sample passing 0.4mm sieve

N. K. Form No. 3143

·DIRECT SHEAR TEST(UU)

DIRECT SHEAR TEST (INITIAL CONDITION: CONSOLIDATION DATA)
(ESSAI DE CISAILLEMENT À LA SURFACE SIMPLE (CONDITION INITIALE: DONNÉES DE CONSOLIDATION:))

(UU) CU CD

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	
SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TPL-1 (m ~ m)	TESTED BY (ESSAI PAR)	

PROPERTIES (PROPRIÉTÉS)

CLASSIFICATION (CLASSIFICATION)	
SPECIFIC GRAVITY (POIDS SPÉCIFIQUE)	2.771
*FINES (FINES)	%
LIQUID LIMIT (LIMITE DE LIQUIDITÉ)	%
PLASTIC LIMIT (LIMITE DE PLASTICITÉ)	%

*FINNER MATERIAL PASSING THE 74μ SIEVE (MATÉRIAU FIN PASSANT AU TRAVERS DU CRIBLE 74μ)

APPARATUS (APPAREIL)

SAMPLE (ÉCHANTILLON): UNDISTURBED · (DISTURBED) (INTACT · REMANIÉ)

TYPE OF APPARATUS (TYPE DE L'APPAREIL): Improved

SHEAR BOX (COFFRET DE CISAILLEMENT)

DIAMETER (DIAMÈTRE): 6.0 cm — CROSS SECTIONAL AREA (SURFACE DE LA SECTION): A 28.27 cm²

UPPER (HAUT): (MOVABLE) · FIXED (BOUGE · FIXE)

LOWER (BAS): MOVABLE (FIXED) (BOUGE · FIXE)

GUIDE (GUIDE): (WITH) · WITHOUT (AVEC · SANS)

LOAD PLATES (PLAQUES DE CHARGEMENT): POROUS STONES · IMPERMEABLE PLATES (PIERRES POREUSES · PLAQUES IMPERMÉABLES)

TEETH (DENTS): CUT · NOT CUT (RAINURÉES · NON RAINURÉES)

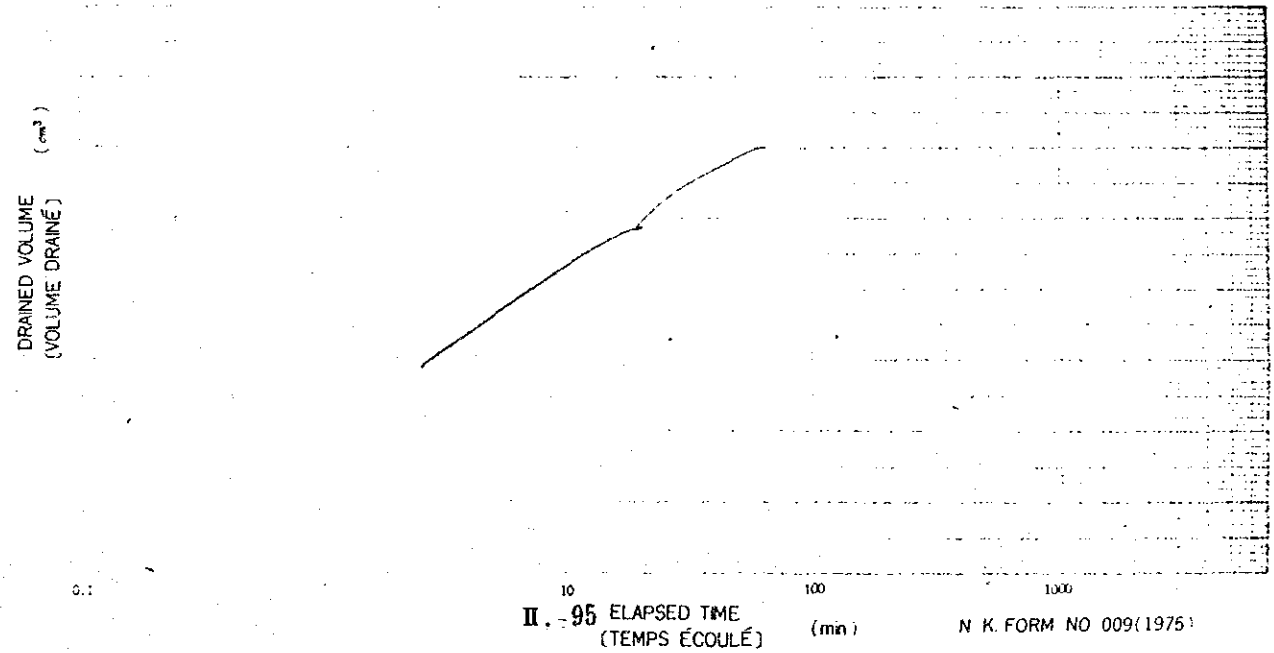
LOAD CAPASITY OF PROVING RINGS (CAPACITÉ DE CHARGE DES ANNEAU DYNAMOMÉTRIQUES)

LOAD FOR SHEAR (CHARGE EN CISAILLEMENT): 200 kg

VERTICAL LOAD (CHARGE VERTICAL): 200 kg

		SPECIMEN NUMBER (NUMÉRO DU SPÉCIMEN)	No. 1	No. 2	No. 3	No. 4	No.	No.
		VERTICAL STRESS (EFFORT VERTICAL) σ_c (kg/cm²)	1.0	2.0	4.0	6.0		
INITIAL CONDITIONS OF SPECIMEN (CONDITIONS INITIALES DU SPÉCIMEN)		HEIGHT (HAUTEUR) h_0 (kg/cm²)	2.0	2.0	2.0	2.0		
		DRY WEIGHT (POIDS SEC) W_s (g)	85.43	85.62	85.65	85.42		
		SUBSTANCE HEIGHT (HAUTEUR DE LA SUBSTANCE) h_s (cm)	1.091	1.093	1.093	1.090		
		VOID RATIO (INDICE DES VIDES) e_0	0.834	0.830	0.829	0.834		
		WATER CONTENT (TENEUR EN EAU) w_0 (%)	25.48	25.26	25.26	25.42		
		DEGREE OF SATURATION (DEGRÉ DE SATURATION) Sr_0 (%)	84.7	84.3	84.4	84.5		
CONSOLIDATION DATA (DONNÉES DE CONSOLIDATION)		CONSOLIDATION TIME (TEMPS DE CONSOLIDATION) t_c (min)						
		TIME (50% OF DEGREE OF CONSOL.) (TEMPS (50% DE DEGRÉ DE CONSOL.)) t_{50} (min)						
		HEIGHT AFTER CONSOL. (HAUTEUR APRÈS CONSOL.) h_c (cm)						
		VOID RATIO AFTER CONSOL. (INDICE DES VIDES APRÈS CONSL.) e_c						
		ROOM TEMPERATURE (TEMPÉRATURE DU LOCAL) (°C)						

TIME-DRAINED VOLUME CURVE FOR CONSOLIDATION
(COURBE TEMPS-VOLUME DRAINÉ POUR CONSOLIDATION)



N. K. FORM NO 009 (1975)

DIRECT SHEAR TEST (LOADING DATA)
(ESSAI DE CISAILLEMEMT À LA SURFACE SIMPLE (DONNÉES DE CHARGEMENT))

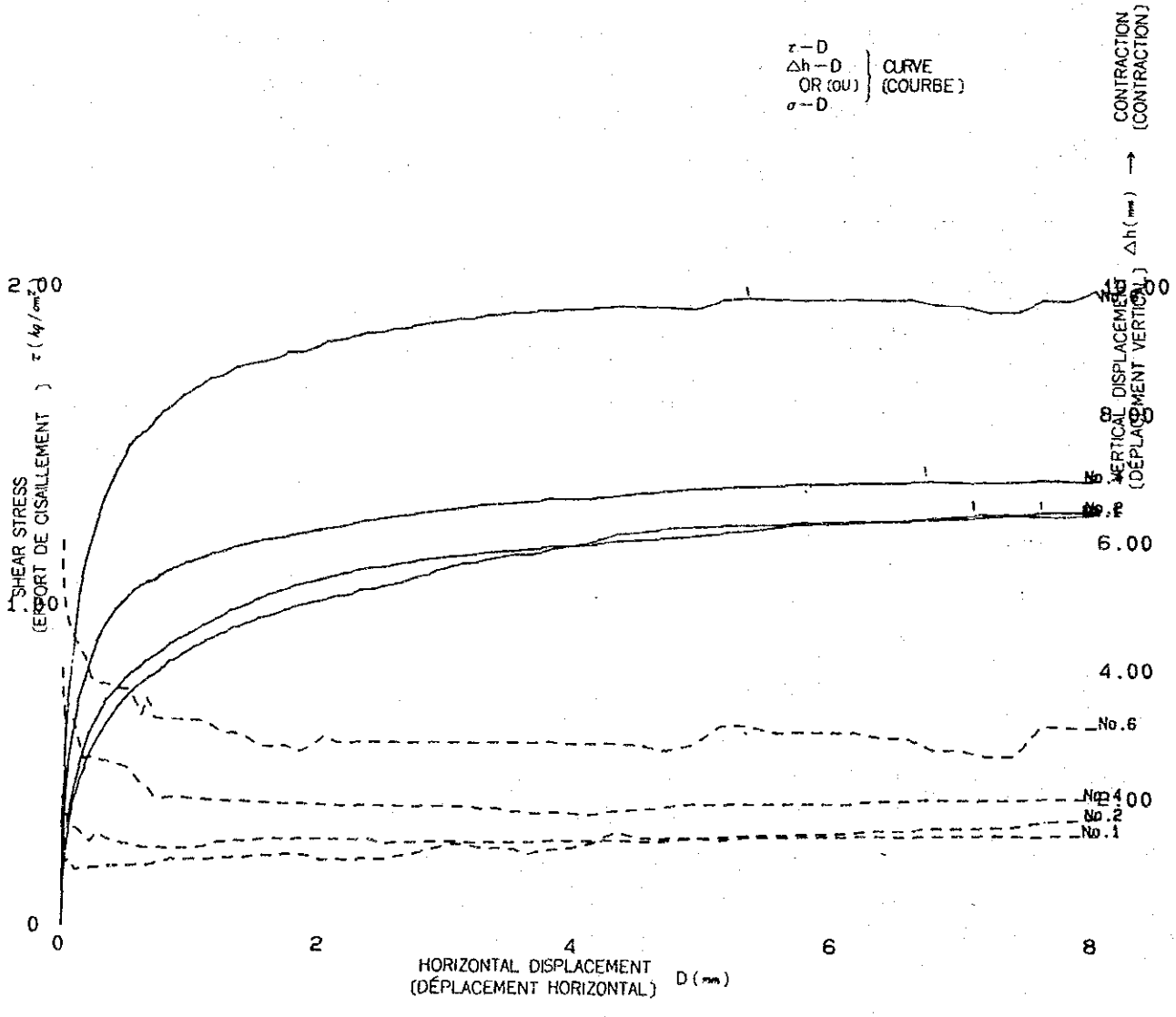
UU / CU / CD

FOR REPORTING
(POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	
SAMPLE NO. & DEPTH (N° DÉ L'ÉCHANTILLON ET PROFONDEUR)	TPL-1 : m ~ m	TESTED BY (ESSAI PAR)	

CONDITION OF DRAINAGE (CONDITION DE DRAINAGE)	CONSOLIDATED · UNCONSOLIDATED (CONSOLIDATION · SANS CONSOLIDATION) / CONST. PRESSURE (PRESSION CONSTANTE) / SLOW SHEARING RATE (TAUX DE CISAIL. LENT) · CONST. VOLUME (VOLUME CONSTANT) / QUICK SHEARING RATE (TAUX DE CISAIL. RAPIDE)	SHEARING METHOD (MÉTHODE DE CISAIL.)	STRAIN CONTROL · STRESS CONTROL · BOTH (CONTRÔLE DE DÉFORMATIONS · CONTRÔLE DE EFFORTS · LES DEUX)
		CONSTANT SHEARING RATE (TAUX DE CISSAILLEMENT CONSTANT)	RATE OF DISPLACEMENT (TAUX DE DÉPLACEMENT) 0.2 mm/mn RATE OF INCREASE OF STRESS (TAUX D'AUGMENTATION DE L'EFFORT) kg/cm²/mn

SPECIMEN NUMBER (NUMÉRO DU SPÉCIMEN)		No. 1	No. 2	No. 3	No. 4	No.	No.
VERTICAL STRESS (EFFORT VERTICAL) σ_c (kg/cm²)		1.0	2.0	4.0	6.0		
ROOM TEMPERATURE (TEMPÉRATURE DU LOCAL) (°C)							
AT PEAK (AU SOMMET)	τ_f (kg/cm²)	1.28	1.28	1.38	1.96		
	e_f OR (OU) (σ_f) (kg/cm²)	1.38	1.60	1.93	3.10		
	$\Delta h/hc$ OR (OU) $\Delta\sigma/\sigma_c$						
	HORIZONTAL DISPLACEMENT (DÉPLACEMENT HORIZONTAL) D(mm)	7.1	7.6	6.7	5.3		
	ELAPSED TIME (TEMPS ÉCOULÉ) (mn)						
τ_s (kg/cm²)							



N.K.FORM NO. 010(1975)

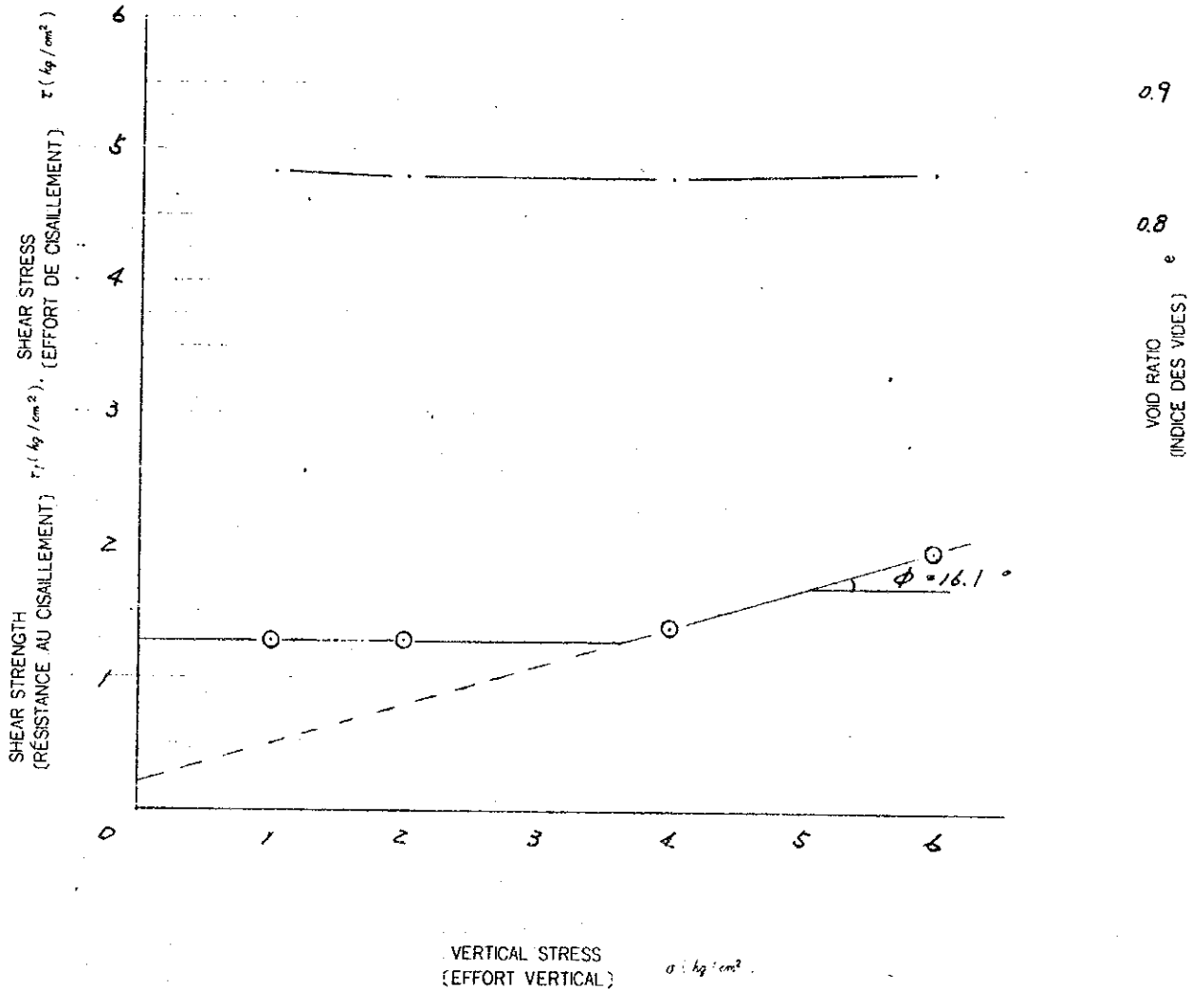
DIRECT SHEAR TEST (VERTICAL STRESS–SHEAR STRESS·VOID RATIO)
(ESSAI DE CISAILLEMENT À LA SURFACE SIMPLE (EFFORT VERTICAL – EFFORT AU CISAILLEMENT ·INDICE DES VIDES ,))

(UU) CU CD FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGNAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	
SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TPL – 1 m – m	TESTED BY (ESSAI PAR)	

SHEARING STRENGTH PARAMETERS (PARAMÈTRES DE RÉSISTANCE AU CISAILLEMENT)		C_w (kg/cm²)	ϕ_w (°)	tan ϕ
SCOPE (ÉTENDU)	NORMALLY CONSOLIDATED (CONSOLIDÉ NORMALEMENT)	0.22	16.1	
	OVER-CONSOLIDATED (SURCONSOLIDÉ)	1.28	0.2	

τ – σ CURVE
e – σ (COURBE)



N.K.FORM NO. 011 (1975)

97

CONSOLIDATION TEST

CONSOLIDATION TEST (CALCULATION)
(ESSAI DE CONSOLIDATION (CALCUL.))

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L' ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	Dec. 90
SAMPLE NO. & DEPTH (N° DE L' ECHANTILLON ET PROFONDEUR)	TPL-1 (m ~ m)	TESTED BY (ESSAI PAR)	

SAMPLE (ÉCHANTILLON)	UNDISTURBED · DISTURBED (INTACT · REMANIÉ)	ROOM TEMPERATURE (TEMPERATURE DU LOCAL) (°C ~ °C)		APPARATUS NO. (N° DE L' APPAREIL)	
PROPERTIES (PROPRIÉTÉS)	CLASSIFICATION (CLASSIFICATION)		SPECIMEN (SPÉCIMEN)	CROSS SECTIONAL AREA (SURFACE DE LA SECTION) A	28.27 cm²	INTIAL WATER CONTENT (TENEUR EN EAU INTIALE) w_0	25.53 %
	SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) Gs	2.771		HEIGHT OF SPECIMEN (HAUT. DU SPÉCIMEN) h_0	2.0 cm	INTIAL VOLUME RATIO (INDICE DE VOLUME INTIAL) f_0	1.828
	LIQUID LIMIT (LIMITE DE LIQUIDITÉ) w_L	%		DRY WEIGHT (POIDS SÈCHÉ) W_d	85.73 g	INITIAL VOID RATIO (INDICE DES VIDES INITIAL) e_0	0.828
	PLASTIC LIMIT (LIMITE DE PLASTICITÉ) w_P	%		SUBSTANCE HEIGHT (HAUTEUR DE SUBSTANCE) hs	1.094 cm	DEGREE OF INITIAL SATURATION (DEGRÉ DE SATURATION INITIALE) S_{r0}	85.5 %

GRADATION OF LOAD (GRADUATION DES CHARGES)	PRESSURE (PRESSION) p (kg/cm²)	PRESSURE (PRESSION) Δp (kg/cm²)	Δd (10^{-3}cm)	h (cm)	$\bar{h}$ (cm)	Δε (%)	mv (cm²/kg)	VOLUME RATIO (INDICE DE VOLUME) f	VOID RATIO (INDICE DES VIDES) e
0	0			2.000				1.828	0.828
		0.2	12.1		1.994	0.607	3.03×10^{-2}		
1	0.2			1.9879				1.816	0.816
		0.2	15.9		1.980	0.803	4.02×10^{-2}		
2	0.4			1.9720				1.802	0.802
		0.4	27.2		1.958	1.389	3.47×10^{-2}		
3	0.8			1.9448				1.777	0.777
		0.8	48.3		1.921	2.514	3.14×10^{-2}		
4	1.6			1.8965				1.733	0.733
		1.6	59.6		1.867	3.192	2.00×10^{-2}		
5	3.2			1.8369				1.678	0.678
		3.2	61.3		1.806	3.394	1.06×10^{-2}		
6	6.4			1.7756				1.622	0.622
		6.4	65.7		1.743	3.769	5.89×10^{-3}		
7	12.8			1.7099				1.562	0.562
		-12.6	-61.7						
8	0.2			1.7716				1.619	0.619
9									

FORMULAE (FORMULE)

$$hs = \frac{Wd}{Gs \cdot \gamma\omega \cdot A}$$

$$\Delta\varepsilon = \frac{\Delta d}{\bar{h}}$$

$$mv = \frac{\Delta\varepsilon(\%)}{\Delta p} \cdot \frac{1}{100}$$

$$f = \frac{h}{hs}$$

$$e = f - 1$$

$$Sr_0 = \frac{Gs \cdot w_0}{e_0}$$

$$\bar{p} = \sqrt{p_n \cdot p_{n-1}}$$

$\sqrt{t}$ METHOD (MÉTHODE $\sqrt{t}$):

$$Cv = \frac{0.848(\bar{h}/2)^2}{t_{90}} \times 1440$$

CURVE RULE METHOD (METHODE PAR COURBE COMPARÉE)

$$C'v = \frac{0.197(\bar{h}/2)^2}{t_{50}}$$

$$Cv = \frac{\Delta d'}{\Delta d} \cdot Cv$$

$$k = \frac{Cv \cdot mv \cdot \gamma\omega}{1.000 / 864 \times 10^7}$$

GRADATION OF LOAD (GRADUATION DES CHARGES)	PRESSURE (PRESSION) p (kg/cm²)	PRESSURE (PRESSION) p̄ (kg/cm²)	0.848(h̄/2)² / 0.197(h̄/2)²	t (min)	Cv (cm²/min) / d	Δd' (10^{-3}cm)	Δd'/Δd	Cv' (cm²/min) / d	k (cm/min) / S
0	0								
		0.1		0.8	1.52×10^{3}	4.6	0.380	5.76×10^{2}	2.02×10^{-7}
1	0.2								
		0.3		0.8	1.50×10^{3}	4.3	0.270	4.04×10^{2}	1.88×10^{-7}
2	0.4								
		0.6		0.8	1.46×10^{3}	8.3	0.305	4.46×10^{2}	1.79×10^{-7}
3	0.8								
		1.2		0.7	1.61×10^{3}	15.6	0.323	5.19×10^{2}	1.89×10^{-7}
4	1.6								
		2.4		0.8	1.33×10^{3}	20.0	0.336	4.46×10^{2}	1.03×10^{-7}
5	3.2								
		4.8		0.8	1.24×10^{3}	20.0	0.326	4.06×10^{2}	4.98×10^{-8}
6	6.4								
		9.6		1.1	8.42×10^{2}	25.1	0.382	3.22×10^{2}	2.19×10^{-8}
7	12.8								
8									
9									

- Δd CONSOLIDATION SETTLEMENT (TASSEMENT APRÈS CONSOLIDATION)
- h HEIGHT OF SPECIMEN (HAUTEUR DU SPÉCIMEN)
- $\bar{h}$ MEAN HEIGHT OF SPECIMEN (HAUTEUR MOYENNE DU SPÉCIMEN)
- Δε COMPRESSIVE STRAIN (DÉFORMATION DE COMPRESSION)
- mv COEFFICIENT OF VOLUME COMPRESSIBILITY (COEFFICIENT DE COMPRESTIBILITÉ VOLUMÉTRIQUE)
- Δd' PRIMARY CONSOLIDATON (CONSOLIDATION PRIMAIRE)
- Cv COEFFICIENT OF CONSOLIDATION (COEFFICIENT DE CONSOLIDATION)
- k COEFFICINT OF PERMEABILITY (COEFFICIENT DE PERMÉABILITÉ)

N. K. FORM NO. 012 (1982)

CONSOLIDATION TEST
(ESSAI DE CONSOLIDATION)

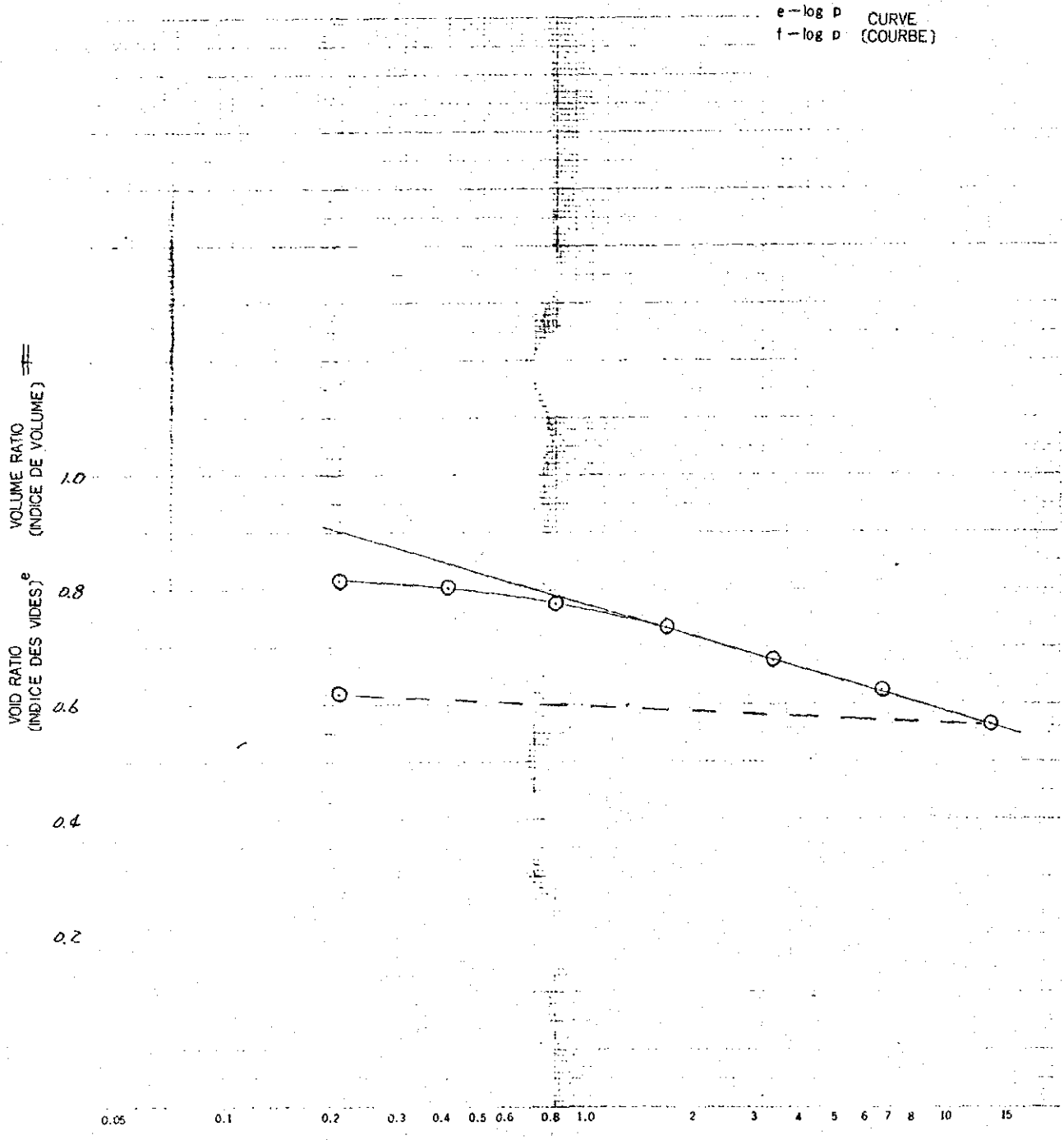
(e – log P CURVE / f – log P (COURBE)) | FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L' ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)	
SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TPL-1 (m – m)	TESTED BY (ESSAI PAR)	

✱UNDISTURBED OR DISTURBED (INTACT OU REMANIÉ)	✱ CLASSIFICATION (CLASSIFICATION)	✱SPECIFIC GRAVITY Gs (POIDS SPÉCIFIQUE)	✱ LIQUID LIMIT w_L (%) (LIMIT DE LIQUIDITÉ)	✱ INITIAL DIMENSION OF SPECIMEN (DIMENSION INITIALE DU SPÉCIMEN) HEIGHT (HAUTEUR) (cm)	DIAMETER (DIAMÈTRE) (cm)
		2.771		2.0	6.0

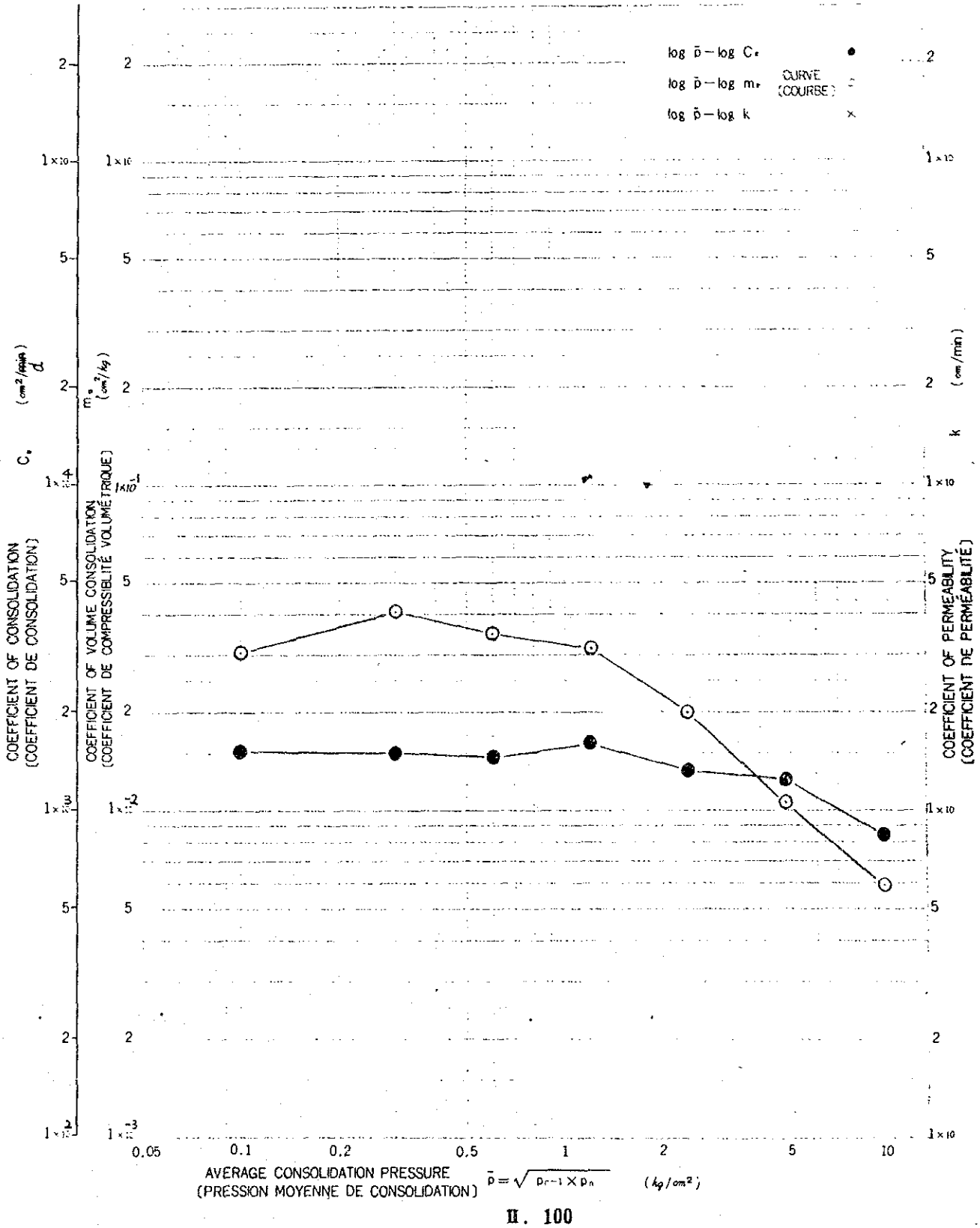
✱INITIAL WATER CONTENT w_o (%) (TENEUR EN EAU INITIALE)	✱INITIAL VOLUME RATIO I (INDICE DE VOLUME INITIAL)	✱INITIAL VOID RATIO e_o (INDICE DES VIDES INITIAL)	✱DEGREE OF INITIAL SATURATION S_r (%) (DEGRÉ DE SATURATION INITIALE)	COMPRESSION INDEX C_c (INDICE DE COMPRESSION)	YIELD STRESS OF CONSOLIDATION P_y (kg/cm²) (LIMITE D'ÉLASTICITÉ DE CONSOLIDATION)
25.58	1.828	0.828	85.5	0.19	–

✱ THE RECORDING IS NOT NECESSARY IN THE CASE THAT CALCULATION DATA SHEET IS APPENDED.
(LES CHIFFRES NE FIGURENT PAS ICIQUAND LA FEUILLE DES CALCULS DÉTAILLÉS EST ANNEXÉE)



N. K. FORM NO. 013 (1982)

CONSOLIDATION TEST (ESSAI DE CONSOLIDATION)	($P-C_v, m_v, k$ CURVE (COURBE))	FOR REPORTING (POUR LE RAPPORT)
NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE (DATE)
SAMPLE NO. & DEPTH (N° DE L' ECHANTILLON ET PROFONDEUR)	TPL-1 (m ~ m)	TESTED BY (ESSAI PAR)



N. K. FORM NO. 014 (1982)

ROCK TEST

- PHYSICAL PROPERTY
- ULTRASONIC WAVE TEST
- UNCOFINED COMPRESSION TEST
- SPLIT TEST

SUMMARY

SUMMARY OF ROCK TEST

FOR REPORTING

NAME OF SURVEY & LOCALITY: MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT

DATE OF REPORTING:

SAMPLE NO.		BD 2	BQ 2
LOCATION NO. & DEPTH		49.8~50.0 m	
ROCK NAME IN LITHOLOGY			
OBSERVATION			
CONDITON OF SPECIMEN IN ROCK TEST	MOISTURE	NAT	NAT
	ANISOTROPY		
APPARENT SPECIFIC GRAVITY G		2.661	2.663
DENSITY γ (g/cm³)		2.652	2.642
NATURAL WATER CONTENT w_n (%)		0.13	0.06
WATER ABSORPTION w_{sat} (%)		0.22	0.16
APPARANT POROSITY n' (%)		0.58	0.42
P & S WAVES VELOCITIES TEST OF ROCK	P WAVE V_P (km/sec)	6.78	6.54
	S WAVE V_S (km/sec)	4.50	3.78
	DYNAMIC MODULUS OF ELASTICITY E_D (kg/cm²)	1.21×10^6	9.62×10^5
	DYNAMIC POISON'S RATIO μ_D	0.106	0.249
UNCONFINED COMPRESSION	UNCONFINED COMPRESSIVE STRENGTH σ_C (kg/cm²)		3409.6
	STATIC MODULUS OF ELASTICITY E_S (kg/cm²)		
	STATIC POISON'S RATIO μ_S		
TENSION	BRAZILIAN TENSILE STRENGTH σ_t (kg/cm²)	177.8	
* TRIAXIAL COMPRESSION	RANGE OF VERTICAL STRESS σ (kg/cm²)		
	SHEAR STRENGTH AT $\sigma = 0$ τ_0 (kg/cm²)		
	ANGLE OF INTERNAL FRICTION ϕ (°)		
HARDNESS	SHORE HARDNESS H_{sh}		
SOUNDNESS	PERCENT LOSS (SODIUM SULFATE TEST) (%)		

*THE RUPTURE LINE IS BASED ON UNCONFINED COMPRESSION, TENSION AND TRIAXIAL COMPRESSION TESTS.

REMARKS

NIPPON KOEI CO., LTD.

N. K. FORM NO. 301 (1977)

/01

PHYSICAL PROPERTY

APPARENT SPECIFIC GRAVITY, WATER ABSORPTION AND POROSITY TESTS OF ROCK

FOR REPORTING

NAME OF SURVEY & LOCALITY	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE	
SAMPLE NO. LOCATION NO. & DEPTH	BD 2 (49.8 m – 50.0 m)	TESTED BY CHECKED BY	
ROCK NAME IN LITHOLOGY		ROOM TEMPERATURE. °C	

DRYING TEMPERATURE 110 °C DRYING HOURS 24 HOURS WETTING HOURS 96 HOURS

SPECIMEN NO.			1	2		MEAN VALUE
WEIGHT OF SPECIMEN	IN NATURAL CONDITION	W_1 (g)	122.9	210.2		
	IN DRY CONDITION	W_2 (g)	122.7	210.0		
	IN SATURATED CONDITION	W_3 (g)	123.0	210.4		
SUBMERGED WEIGHT OF SPECIMEN IN SATURATED CONDITION		W_4 (g)	76.8	131.4		
WEIGHT OF WATER EQUAL TO VOLUME OF SPECIMEN		$W_3 - W_4$ (g)	46.2	79.0		
WEIGHT OF WATER IN SATURATED PORE OF SPECIMEN		$W_3 - W_2$ (g)	0.3	0.4		
NATURAL APPARENT SRECIFIC GRAVITY	$Gn = \frac{W_1}{W_3 - W_4}$		2.660	2.661		2.661
DRY APPARENT SPECIFIC GRAVITY	$Gdry = \frac{W_2}{W_3 - W_4}$		2.656	2.658		2.657
SATURATED APPARANT SPECIFIC GRAVITY	$Gsat = \frac{W_3}{W_3 - W_4}$		2.662	2.663		2.663
WATER CONTENT OF ROCK	$wn = \frac{W_1 - W_2}{W_2} \times 100(\%)$		0.16	0.10		0.13
WATER ABSORPTION OF ROCK	$wsat = \frac{W_3 - W_2}{W_2} \times 100(\%)$		0.24	0.19		0.22
APPARANT POROSITY	$n' = \frac{W_3 - W_2}{W_3 - W_4} \times 100(\%)$		0.65	0.51		0.58

(1) DRY CONDITION IS THE CONDITION OF SPECIMEN AFTER DRYING FOR HOURS AT A CONSTANT TEMPERATURE. GENERALLY 80 TO 110°C AND 24 HOURS APPLIED FOR DRYING.

(2) SATURATED CONDITION IS THE CONDITION OF SPECIMEN AFTER WETTING FOR HOURS. GENERALLY 48 TO 96 HOURS APPLIED FOR WETTING.

(3) SPECIFIC GRAVITY IN THIS TEST IS THE ONE OF A ROCK PIECE WHICH CONSISTS OF SOLID AND PORE FILLED WITH WATER AND AIR. A ROCK PIECE INCLUDES PORES WITHOUT PASS LEADING OUTSIDE A ROCK, SO SPECIFIC GRAVITY IN THIS TEST DOESN'T SHOW SPECIFIC GRAVITY OF SOLID ONLY. THEREFORE THE SPECIFIC GRAVITY IN THIS TEST IS CALLED APPARENT SPECIFIC GRAVITY.

(4) NATURAL, DRY AND SATURATED APPARANT SPECIFIC GRAVITIES ARE SPECIFIC GRAVITIES IN NATURAL, DRY AND SATURATED CONDITIONS.

(5) WATER CONTENT OF ROCK IS WEIGHT OF WATER LOST BY DRYING FROM NATURAL CONDITION TO DRY CONDITION AND EXPRESSED IN PERCENT OF WEIGHT OF SPECIMEN IN DRY CONDITION.

(6) WATER ABSORPTION OF ROCK IS WEIGHT OF WATER ABSORBED BY WETTING FROM DRY CONDITION TO SATURATED CONDITION AND EXPRESSED IN PERCENT OF WEIGHT OF SPECIMEN IN DRY CONDITION.

(7) APPARENT POROSITY IS VOLUME OF PORES OPENING OUTSIDE A ROCK PIECE AND EXPRESSED IN PRCENT OF VOLUME OF SPECIMEN.

REMARKS

NIPPON KOEI CO., LTD. N. K. FORM NO. 302 (1977)

APPARENT SPECIFIC GRAVITY, WATER ABSORPTION AND POROSITY TESTS OF ROCK

FOR REPORTING

NAME OF SURVEY & LOCALITY	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE	
SAMPLE NO. & DEPTH / LOCATION NO.	BQ 2 (26.3 m ~ m)	TESTED BY / CHECKED BY	
ROCK NAME IN LITHOLOGY		ROOM TEMPERATURE	°C

DRYING TEMPERATURE 110 °C DRYING HOURS 24 HOURS WETTING HOURS 96 HOURS

SPECIMEN NO.			1	2		MEAN VALUE
WEIGHT OF SPECIMEN	IN NATURAL CONDITION	W_1 (g)	199.7	171.4		
	IN DRY CONDITION	W_2 (g)	199.6	171.3		
	IN SATURATED CONDITION	W_3 (g)	200.0	171.5		
SUBMERGED WEIGHT OF SPECIMEN IN SATURATED CONDITION		W_4 (g)	124.8	107.3		
WEIGHT OF WATER EQUAL TO VOLUME OF SPECIMEN		W_3-W_4 (g)	75.2	64.2		
WEIGHT OF WATER IN SATURATED PORE OF SPECIMEN		W_3-W_2 (g)	0.4	0.2		
NATURAL APPARENT SPECIFIC GRAVITY	$Gn=\frac{W_1}{W_3-W_4}$		2.656	2.670		2.663
DRY APPARENT SPECIFIC GRAVITY	$Gdry=\frac{W_2}{W_3-W_4}$		2.654	2.668		2.661
SATURATED APPARANT SPECIFIC GRAVITY	$Gsat=\frac{W_3}{W_3-W_4}$		2.660	2.671		2.666
WATER CONTENT OF ROCK	$w_n=\frac{W_1-W_2}{W_2}\times 100(\%)$		0.05	0.06		0.06
WATER ABSORPTION OF ROCK	$w_{sat}=\frac{W_3-W_2}{W_2}\times 100(\%)$		0.20	0.12		0.16
APPARANT POROSITY	$n'=\frac{W_3-W_2}{W_3-W_4}\times 100(\%)$		0.53	0.31		0.42

(1) DRY CONDITION IS THE CONDITION OF SPECIMEN AFTER DRYING FOR HOURS AT A CONSTANT TEMPERATURE, GENERALLY 80 TO 110°C AND 24 HOURS APPLIED FOR DRYING.

(2) SATURATED CONDITION IS THE CONDITION OF SPECIMEN AFTER WETTING FOR HOURS. GENERALLY 48 TO 96 HOURS APPLIED FOR WETTING.

(3) SPECIFIC GRAVITY IN THIS TEST IS THE ONE OF A ROCK PIECE WHICH CONSISTS OF SOLID AND PORE FILLED WITH WATER AND AIR. A ROCK PIECE INCLUDES PORES WITHOUT PASS LEADING OUTSIDE A ROCK. SO SPECIFIC GRAVITY IN THIS TEST DOESN'T SHOW SPECIFIC GRAVITY OF SOLID ONLY. THEREFORE THE SPECIFIC GRAVITY IN THIS TEST IS CALLED APPARENT SPECIFIC GRAVITY.

(4) NATURAL, DRY AND SATURATED APPARANT SPECIFIC GRAVITIES ARE SPECIFIC GRAVITIES IN NATURAL, DRY AND SATURATED CONDITIONS.

(5) WATER CONTENT OF ROCK IS WEIGHT OF WATER LOST BY DRYING FROM NATURAL CONDITION TO DRY CONDITION AND EXPRESSED IN PERCENT OF WEIGHT OF SPECIMEN IN DRY CONDITION.

(6) WATER ABSORPTION OF ROCK IS WEIGHT OF WATER ABSORBED BY WETTING FROM DRY CONDITION TO SATURATED CONDITION AND EXPRESSED IN PERCENT OF WEIGHT OF SPECIMEN IN DRY CONDITION.

(7) APPARENT POROSITY IS VOLUME OF PORES OPENING OUTSIDE A ROCK PIECE AND EXPRESSED IN PRCENT OF VOLUME OF SPECIMEN.

REMARKS

ULTRASONIC WAVE TEST

P&S WAVES VELOCITIES TEST OF ROCK

FOR REPORTING

NAME OF SURVEY & LOCALITY	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE	
		TESTED BY / CHECKED BY	

SAMPLE NO. / LOCATION NO.			BD2	BQ2				
DEPTH		(m)						
ROCK NAME IN LITHOLOGY								
SPECIMEN NO.								
* MOISTURE CONDITION			(NAT); SAT; DRY	(NAT); SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY
LENGTH	L	(cm)	5.083	9.941				
DIAMETER	D	(cm)	6.179	5.113				
VOLUME	V	(cm^3)	152.43	204.11				
WEIGHT	W	(g)	404.27	539.22				
DENSITY	γ	(g/cm^3)	2.652	2.642				
LONGITUDINAL WAVE (P WAVE)	TIME OF PROPAGATION	t_p ($\times 10^{-6}$ sec)	7.50	15.2				
	VELOCITY	$V_p = \frac{L}{t_p}$ (km/sec)	6.78	6.54				
TRANSVERSAL WAVE (S WAVE)	TIME OF PROPAGATION	t_s ($\times 10^{-6}$ sec)	11.3	26.3				
	VELOCITY	$V_s = \frac{L}{t_s}$ (km/sec)	4.50	3.78				
$(t_s/t_p)^2$			2.270	2.994				
$2\{(V_p/V_s)^2 - 1\}$			2.540	3.987				
DYNAMIC POISON'S RATIO μ_D **			0.106	0.249				
DYNAMIC MODULUS OF ELASTICITY E_D ***		(kg/cm^2)	1.21×10^6	9.62×10^5				

ROOM TEMPERATURE °C

※LETTERS OF NAT & SAT SHOW "NATURAL" AND "SATURATED ".

※※ $\mu_D = \frac{(Vp/Vs)^2 - 2}{2\{(Vp/Vs)^2 - 1\}} = \frac{(ts/tp)^2 - 2}{2\{(ts/tp)^2 - 1\}}$

※※※ $E_D = \frac{2\gamma(1+\mu_D)Vs^2}{g}$ (g = ACCELERATION ≒ 980 cm / sec^2)

REMARKS

03

UNCOFINED COMPRESSION TEST

UNCONFINED COMPRESSION TEST OF ROCK

FOR REPORTING

NAME OF SURVEY & LOCALITY	NAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE	
SAMPLE NO. & LOCATION NO. & DEPTH	BQ 2 (m ~ m)	TESTED BY / CHECKED BY	

ROCK NAME IN LITHOLOGY

CONTROL METHOD: STRAIN CONTROL, STRESS CONTROL

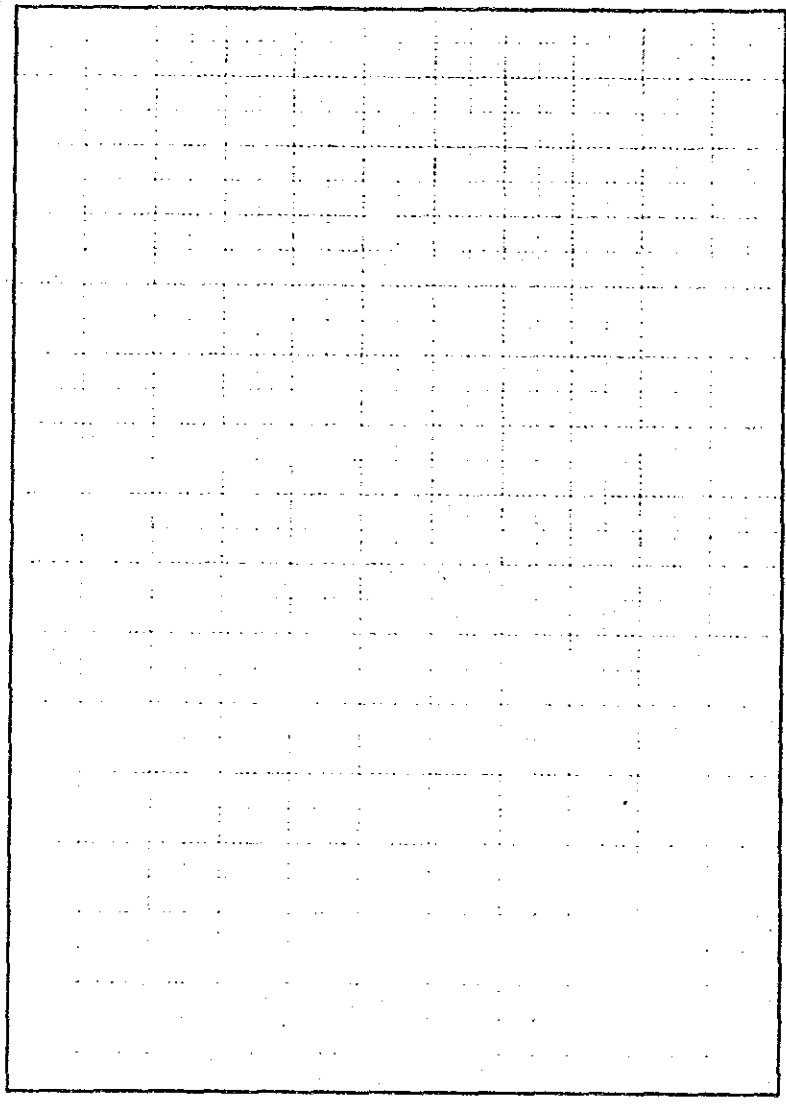
CONSTANT COMPRESSION RATE 10 kg/cm² / sec, min

SPECIMEN NO.	MOISTURE ※ CONDITION	MOISTURE ※※ (%)	HEIGHT (cm)	DIAMETER (cm)	DENSITY γ (g/cm³)	UNCONFINED COMPRESSIVE STRENGTH σc (kg/cm²)	STRAIN AT FAILURE ε (%)	※※※ STATIC MODULUS OF ELASTICITY E_M (kg/cm²)	(kg/cm²)	(kg/cm²)
	(NAT); SAT; DRY		9.941	5.113	2.642	3409.6				
	NAT; SAT; DRY									
	NAT; SAT; DRY									

※LETTERS OF NAT & SAT SHOW "NATURAL" AND "SATURATED."

※※WATER CONTENT; IT IS NOTED IN THE CASE THAT IT IS SPECIALLY DETERMINED.

※※※ DEFINITIONS OF MODULUS OF ELASTICITY ARE SHOWN IN THE COLUMN OF REMARKS.



ASPECT OF FAILURE

SKETCH | OBSERVATION

NO.

NO.

NO.

REMARKS

SPLIT TEST

BRAZILIAN TEST OF ROCK

FOR REPORTING

NAME OF SURVEY & LOCALITY	MAGWAGWA HYDROELECTRIC POWER DEVELOPMENT PROJECT	DATE	
		TESTED BY / CHECKED BY	

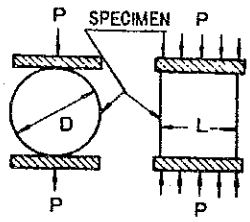
RATE OF INCREASE OF STRESS 0.6 kg/cm²/sec

SAMPLE NO. / LOCATION NO.	BD 2					
DEPTH (m)						
ROCK NAME IN LITHOLOGY						
SPECIMEN NO.						
* MOISTURE CONDITION	(NAT) SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY	NAT; SAT; DRY
LENGTH L (cm)	5.083					
DIAMETER D (cm)	6.179					
WEIGHT W (g)	152.43					
DENSITY γ (g/cm³)	2.652					
MAXIMUM COMPRESSIVE LOAD P'_t (kg)	8770					
** TENSILE STRENGTH $\sigma'_t = 2P'_t/\pi DL$ (kg/cm²)	177.8					
*** L/D	0.8					

※ LETTERS OF NAT & SAT SHOW "NATURAL" AND "SATURATED".

※※ IN THE BRAZILIAN TEST, A CYLINDRICAL SPECIMEN IS LINEARLY LOADED ON ITS SIDE FACE AS SHOWN IN THE FIGURE. THE TENSILE STRENGTH IN THE BRAZILIAN TEST IS THE TENSILE STRESS AT THE FAILURE OF SPECIMEN. THE TENSILE STRESS IS THE ONE IN THE DIRECTION VERTICAL TO LOAD AXIS PLANE, AND IS THE SOLUTION BASED ON THE THEORY OF ELASTISITY.

※※※ THE L/D VALUE IS DEFINED BETWEEN FROM 0.5 TO 2.0, AND ITS DESIRABLE VALUE IS 1.0.



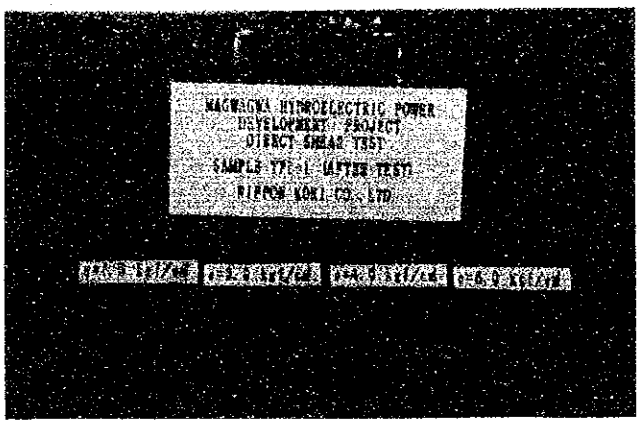
SKETCH OF FAILURE

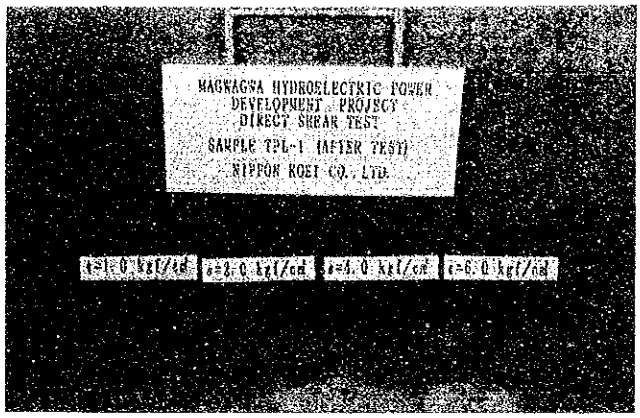
SAMPLE NO. ____ SPECIMEN NO. BD-2 SAMPLE NO. ____ SPECIMEN NO. ____ SAMPLE NO. ____ SPECIMEN NO. ____

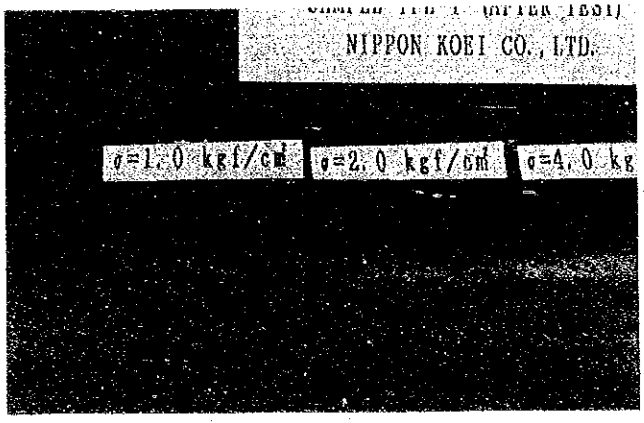
SAMPLE NO. ____ SPECIMEN NO. ____ SAMPLE NO. ____ SPECIMEN NO. ____ SAMPLE NO. ____ SPECIMEN NO. ____

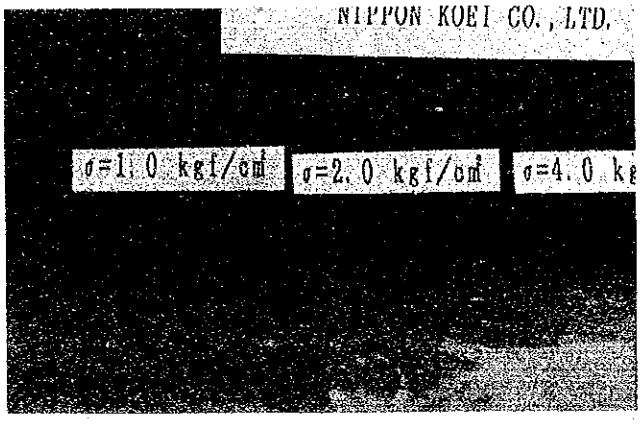
REMARKS

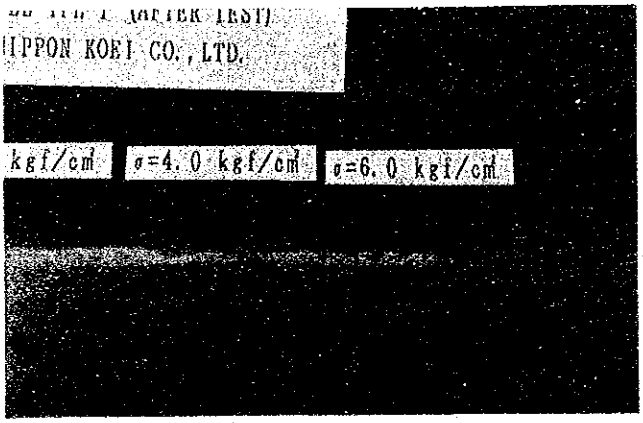
PHOTO

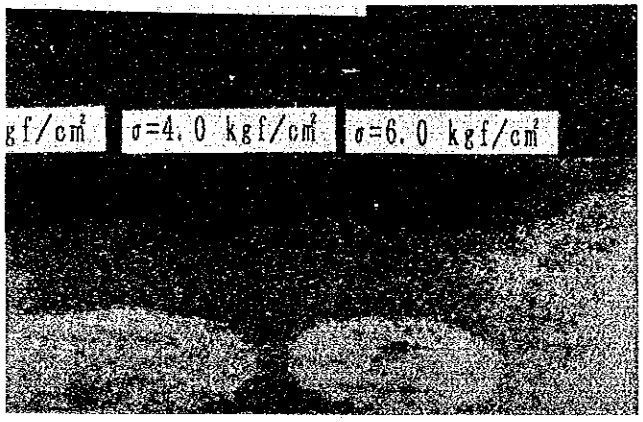

MAGNAGNA HYDROELECTRIC POWER
DEVELOPMENT PROJECT
DIRECT SHEAR TEST
NIPPON KOEI CO., LTD.

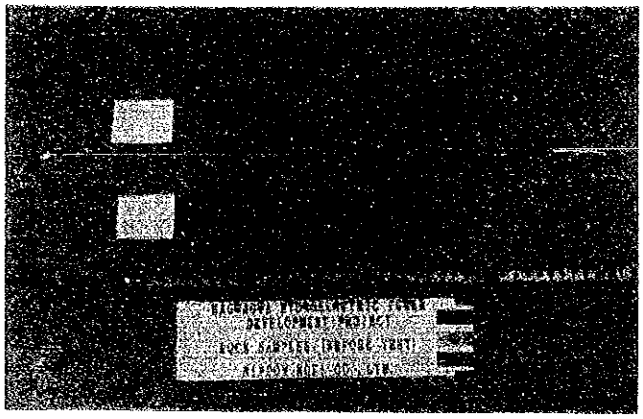

MAGNAGNA HYDROELECTRIC POWER
DEVELOPMENT PROJECT
DIRECT SHEAR TEST
SAMPLE TPL-1 (AFTER TEST)
NIPPON KOEI CO., LTD.

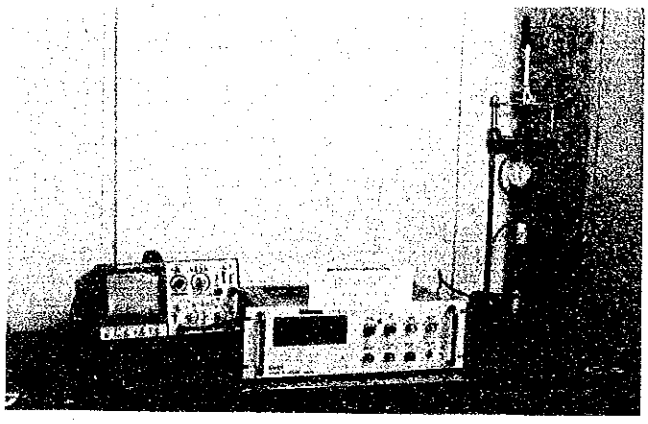

NIPPON KOEI CO., LTD.
σ=1.0 kgf/cm²
σ=2.0 kgf/cm²

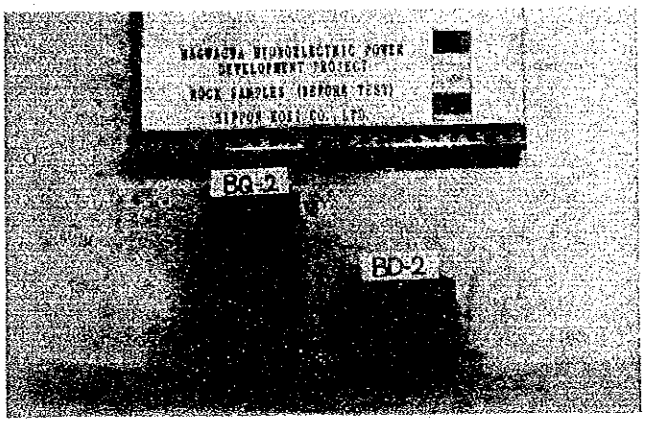

NIPPON KOEI CO., LTD.
σ=1.0 kgf/cm²
σ=2.0 kgf/cm²

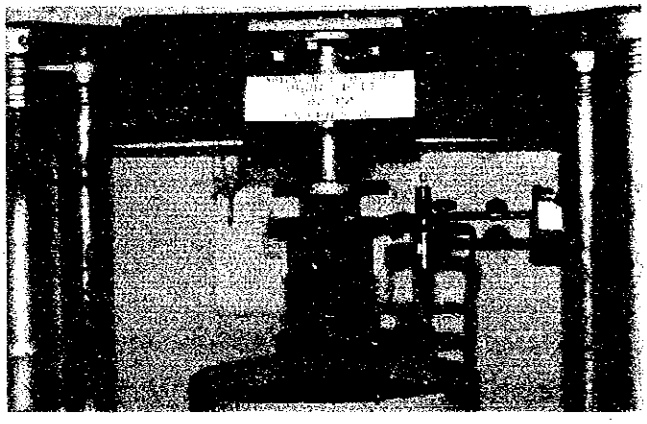

NIPPON KOEI CO., LTD.
σ=4.0 kgf/cm²
σ=6.0 kgf/cm²

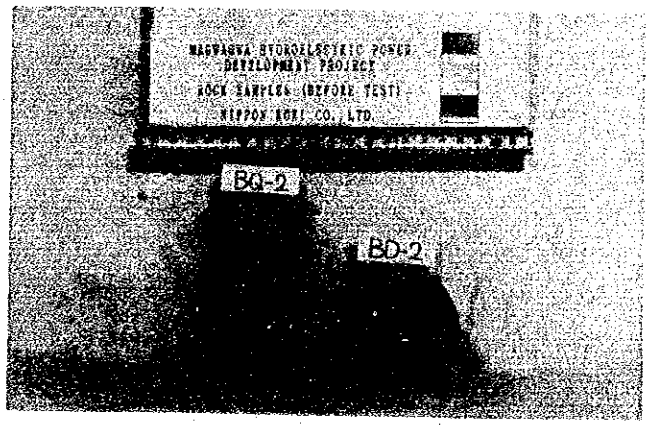

σ=4.0 kgf/cm²
σ=6.0 kgf/cm²






NAGWAGWA HYDROELECTRIC POWER
DEVELOPMENT PROJECT
ROCK SAMPLES (BEFORE TEST)
NIPPON KOEI CO., LTD.
BQ-2
BD-2




NAGWAGWA HYDROELECTRIC POWER
DEVELOPMENT PROJECT
ROCK SAMPLES (BEFORE TEST)
NIPPON KOEI CO., LTD.
BQ-2
BD-2