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PT. Indra Karya (Persero)
Consulting Engineers

HOLE No. B - 19

Fig. 1.1.18 DRILL LOG

PROJECT	LIBABANG DAM		DEPTH	INCLINATION	ELEVATION	3000	VERTICAL	DRILL RIG	ELEVATION
	DATE	NOV. 18, 1997							
SITE	COORDINATE X	COORDINATE Y	DEPTH	INCLINATION	ELEVATION	3000	VERTICAL	DRILL RIG	ELEVATION
CLIENT	DATE	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997	NOV. 18, 1997
SAMPLING	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY %	R Q D	WATER PRESSURE TEST LUGEON VALUE
	0.50	146.979	X	TOP SOIL			100	0	
1	1.00	146.479		SANDY TUFF, soft ~ dense, light brown		D	100	0	
2							100	0	
3							100	0	
4				SILTY TUFF, soft, brown		CL-L	100	0	
5							100	0	
6							100	0	
7							100	0	
8	7.90	139.679					100	0	
9	9.00	138.479		SANDY TUFF, dense, brown		CL-L	100	0	
10	9.60	137.879		CONGLTIC SANDSTONE, poor cemented, grey		CL-L	100	0	
11	11.30	136.179		TUFF, fine, compact, light brown		CL-H	100	28	
12	11.66	135.699		CONGLTIC SANDSTONE, compact, grey		CL-L	100	30	
13	14.50	132.879		TUFF, CONGLTIC SSTONE (nearly volc breccia), with diorite gravel (Ø 1-2 cm), compact, grey		CM-L	100	36	Lugeon Value = 32.03 Critical Pressure = kg/cm ²
14	14.60	132.879		TUFF, fine, light brown		CL-H	100	25	
15	19.00	128.479		CONGLOMERATE, poor cemented, light brown		CL-H	90	0	
16							90	0	
17							90	0	
18							90	10	Lugeon Value = 75.64 Critical Pressure = kg/cm ²
19	19.85	127.629		CONGLTIC SANDSTONE, compact, brown		CL-H	100	45	
20	20.05	127.429		SANDSTONE, coarse, dense, light grey		CL-H	100	10	

NO	DATE	DEPTH (m)	DESCRIPTION	UNIT	Wt %	Moisture (%)	Specific Gravity	Porosity (%)	Void Ratio	Compression Index	Shrinkage (%)	Swelling (%)	Other
15	NOVEMBER 22, 1997	14.50	TUFF, fine, light brown	CL-H	100	25							
16		14.60			90	0							
17		14.70	CONGLOMERATE, poor cemented, light brown	CL-H	90	0							
18		14.80			90	10							Lugeon Value = 75.64 Critical Pressure = kg/cm ²
19		14.90			100	10							
20		15.00	CONGLOMERATE, compact, brown	CL-H	100	45							
21		15.10	SANDSTONE, coarse, dense, light grey	CL-H	100	10							
22		15.20	CONGLOMERATE, compact, light brown	CL-H	100	19							
23		15.30			100	20							Lugeon Value = 14.77 Critical Pressure = 4.28 kg/cm ²
24		15.40	TUFF, dense, light grey	CL-H	80	14							
25		15.50	SANDSTONE, fine, dense, light brown	CL-H	100	28							
26		15.60	CONGLOMERATE, compact, greyish brown	CL-H	100	0							
27		15.70	TUFF, STONE, fine grained, nearly tuff, grey	CL-H	100	0							
28		15.80	CONGLOMERATE, compact, grey	CL-H	100	0							
29		15.90	TUFF, fine, dense, light brown	CL-H	100	0							
30		16.00	CONGLOMERATE, compact, grey	CL-H	100	0							
31		16.10	SANDSTONE, fine grained, dense, light brown	CL-H	100	0							
32		16.20	TUFF, STONE (nearly sandy tuff), coarse grained, dense, brown	CL-H	100	0							Lugeon Value = 2.50 Critical Pressure = 4.21 kg/cm ²
33		16.30	CONGLOMERATE, compact, brownish grey	CL-H	100	0							
34		16.40	SANDY TUFF, dense, grey	CL-H	90	0							
35		16.50			80	0							
36		16.60			80	0							
37		16.70			80	0							
38		16.80			80	0							Lugeon Value = 9.35 Critical Pressure = kg/cm ²
39		16.90	VOLCANIC BRECCIA, good cemented, grey with andesite gravel (37.30 ~ 37.35 & 40.15 ~ 40.40)	CM-H	100	30							
40		17.00			95	0							
41		17.10			90	10							
42		17.20			100	30							
43		17.30			100	30							Lugeon Value = 34.63 Critical Pressure = 2.13 kg/cm ²
44		17.40			100	50							
45		17.50			100	20							
46		17.60			100	20							
47		17.70	SILTSTONE, disturbed, black	D	90	0							
48		17.80	SANDY TUFF, dense, dark grey	CL-H	100	0							
49		17.90	SANDSTONE, coarse grained, dense, grey	CL-H	100	0							
50		18.00	CONGLOMERATE, compact, brownish grey	CM-L	100	10							Lugeon Value = 58.63 Critical Pressure = 3.02 kg/cm ²
51		18.10	SANDSTONE, coarse grained, dense, grey	CL-H	100	0							
52		18.20	CONGLOMERATE, compact, brownish grey	CM-L	100	0							

Depth (m)	Soil Description	Soil Type	Moisture (%)	Void Ratio (e)	Specific Gravity (G _s)	Unit Weight (γ _t) (kg/cm ³)	Liquid Limit (LL) (%)	Plastic Limit (PL) (%)	Shrinkage (%)	Penetration (mm)	Roller Resistance (kg/cm ²)	Moisture Ratio (w)	Shrinkage Ratio (s)	Shrinkage Index (SI)	Moisture Ratio at Shrinkage (w _s)	Shrinkage Ratio at Shrinkage (s _s)	Shrinkage Index at Shrinkage (SI _s)	Moisture Ratio at Critical Pressure (w _c)	Critical Pressure (p _c) (kg/cm ²)	Moisture Ratio at Lugeon (w _L)	Lugeon Value (L)	Critical Pressure at Lugeon (p _{cL}) (kg/cm ²)	
35	VOLCANIC BRECCIA, good cemented, grey with andesite gravel (37.30 ~ 37.35 & 40.15 ~ 40.40)	CM-H																					
36																							
37																							
38																							
39																							
40																							
41	SILTSTONE, disturbed, black	D	41.00	106.479																			
42	SANDY TUFF, dense, dark grey	CL-H	41.80	105.679																			
42	SANDSTONE, coarse grained, dense, grey	CL-H	42.00	105.479																			
42	CONGLTIC SANDSTONE, compact, brownish grey	CM-L	42.30	105.179																			
43	SANDSTONE, coarse grained, dense, grey	CL-H	42.70	104.779																			
43	CONGLTIC SANDSTONE, compact, brownish grey	CM-L	43.00	104.479																			
44	SANDSTONE, fine ~ med. grained, dense, grey	CL-H	43.40	104.079																			
44	CONGLTIC SANDSTONE, compact, brownish grey	CM-L	43.70	103.779																			
44	TUFF, fine, dense, light grey	CL-H	44.00	103.479																			
44		CL-H	44.25	103.229																			
45	SANDSTONE, fine grained, dense ~ compact, greyish brown	CL-H	45.70	101.779																			
46	CONGLTIC SANDSTONE, poor cemented, brownish grey	CL-H	46.25	101.229																			
47	SANDSTONE, fine grained, dense, light grey	CL-H	46.80	100.679																			
48	TUFF, fine, dense, light brown	CL-L	47.90	99.579																			
49	SANDSTONE, fine grained, dense, light grey	CL-H	48.70	98.779																			
50	TUFF, fine ~ coarse, dense, grey	CL-H	50.00	97.479																			
51	CONGLTIC SANDSTONE, compact, grey	CL-H	51.40	96.029																			
52	SANDSTONE, fine grained, dense, grey	CL-H	51.60	95.879																			
52	TUFF, dense, light grey	CL-H	51.90	95.579																			
53	CONGLTIC SANDSTONE, compact, grey	CM-L	52.85	94.629																			
54	SANDSTONE, fine ~ coarse grained, light brown	CL-H	53.70	93.779																			
54	TUFF, coarse, light brown	CL-H	54.00	93.479																			
55	SANDSTONE, fine ~ coarse grained, light brown	CL-H	54.60	92.879																			
55	SANDSTONE, fine grained, dense, light brown	CL-H																					
56	TUFF, dense, light brown	CL-H	55.45	92.029																			
56	TUFF, coarse, light brown	CL-H	56.30	91.179																			
57	SANDSTONE, fine grained, dense, light brown	CL-H	56.55	90.929																			
58	CONGLTIC SANDSTONE, laminae observed, with pumice, dark grey	CL-H	57.00	90.479																			
59	SANDSTONE, fine grained, dense, light brown	CL-H	58.00	89.479																			
60	SANDSTONE, fine grained, laminae observed, grey	CL-L	58.70	88.579																			
61	TUFF, fine, with organic & pumice, greyish white	CL-H	59.60	87.879																			
62	CONGLTIC SANDSTONE, with pumice, greyish black	CL-H	60.05	87.429																			
63	SANDSTONE, med. grained, disturbed, bl. grey	D	60.80	86.879																			
64	SANDSTONE, f. grained, laminae observed, grey	CL-H	60.95	86.829																			
65	TUFF, with wood fragment, greyish white	CL-H	61.30	86.179																			
66																							
67																							
68																							
69																							
70																							
71																							
72																							
73																							

Lugeon Value = 54.63
Critical Pressure = 2.13 kg/cm²

Lugeon Value = 58.65
Critical Pressure = 3.02 kg/cm²

Lugeon Value = 7.51
Critical Pressure = 1.51 kg/cm²

Lugeon Value = 9.09
Critical Pressure = 1.51 kg/cm²

Lugeon Value = 13.89
Critical Pressure = 8.12 kg/cm²

Lugeon Value = 17.53
Critical Pressure = 6.64 kg/cm²

DATE	DEPTH (m)	TEST NO.	DEPTH (m)	DESCRIPTION	CLASSIFICATION	WATER LEVEL (m)	ROCK QUALITY DESIGNATION (R.Q.D. %)	LUGEON VALUE (kg/cm ²)	CRITICAL PRESSURE (kg/cm ²)
DECEMBER 15, 1997	54.60	55	92.879	SANDSTONE, fine grained, dense, light brown	CL-H	55.45	100	13.99	8.12
DECEMBER 13, 1997	55.45	56	92.029	TUFF SANDSTONE, dense, dark grey	CL-H	56.25	100	13.99	8.12
DECEMBER 11, 1997	56.25	57	91.179	TUFF, coarse, light brown	CL-H	56.45	100	13.99	8.12
DECEMBER 09, 1997	56.45	58	90.479	SANDSTONE, fine grained, dense, light brown	CL-H	57.00	100	13.99	8.12
DECEMBER 09, 1997	57.00	59	89.479	CONGLUTIC SANDSTONE, laminae observed, with pumice, dark grey	CL-H	58.00	100	13.99	8.12
DECEMBER 10, 1997	58.00	60	88.479	SANDSTONE, fine grained, laminae observed, grey	CL-L	58.71	100	13.99	8.12
DECEMBER 10, 1997	58.71	61	87.879	TUFF, fine, with organic & pumice, greyish white	CL-H	59.60	100	13.99	8.12
DECEMBER 10, 1997	59.60	62	87.429	CONGLUTIC SANDSTONE, with pumice, greyish black	CL-H	60.05	100	13.99	8.12
DECEMBER 10, 1997	60.05	63	86.679	SANDSTONE, med. grained, disturbed, bl. grey	D	60.80	100	13.99	8.12
DECEMBER 10, 1997	60.80	64	86.329	SANDSTONE, f. grained, laminae observed, grey	CL-H	61.30	100	13.99	8.12
DECEMBER 10, 1997	61.30	65	86.179	TUFF, with wood fragment, greyish white	CL-H	61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	66	85.479			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	67	84.579			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	68	83.679			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	69	82.779			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	70	81.879			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	71	80.979	VOLCANIC BRECCIA, compact, grey with tuff 69.75 - 70.20	CM-H	61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	72	80.079			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	73	79.179			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	74	78.279			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	75	77.379			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	76	76.479			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	77	75.579			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	78	74.679			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	79	73.779			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	80	72.879			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	81	71.979			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	82	71.079			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	83	70.179			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	84	69.279			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	85	68.379			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	86	67.479			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	87	66.579			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	88	65.679			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	89	64.779			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	90	63.879			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	91	62.979			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	92	62.079			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	93	61.179			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	94	60.279			61.30	100	13.99	8.12
DECEMBER 15, 1997	61.30	95	59.379			61.30	100	13.99	8.12

END OF DRILLING

R. Q. D. = Rock Quality Designation = (Total Length of Cylindric Cores longer than 10 cm) / (Total Core Length) x 100 %

LUGEON VALUE is ltr/min/mtr under injection water pressure by 10 kgf/cm²

G. W. L. = Ground Water Level = Height of Spring Water



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Fig. 1.1.19 DRILL LOG

HOLE No. B - 20

PROJECT		JABBARANG DAM		DEPTH		80.00 M		ELEVATION		120.37	
SITE		DAM SITE		INCLINATION		VERTICAL		DRILL RIG		TUHO	
CLIENT		DATE		DESCRIPTION		ROCK GRADE		LOGGED BY		DIDIN PRANOWO	
COORDINATE X		COORDINATE Y		DATE		DRILLED BY		EASORI		EASORI	
116.222309		116.260416		Dec 02, 1997 till Dec 23, 1997		D		D		D	
JICA		JICA		DEC 02, 1997 till DEC 23, 1997		D (IV)		D		D	
SAMPLING	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY %	R Q D	WATER PRESSURE TEST LUGEON VALUE		
DATE											
DEC. 02, 1997	1	138.372	X	TOP SOIL			100	0			
	2						100	0			
	3						100	0			
	4						100	0			
	5						100	0			
	6						100	0			
	7			SANDY TUFF, soft, brown		D	100	0			
	8						100	0			
	9						100	0			
	10						100	0			
	11						100	0			
	12	127.372					100	0			
	13	124.722		TUFF SANDSTONE, medium ~ coarse grained, soft ~ dense, light brown		CL-L	100	0			
	14						100	0			
	15			CONGLOMERATE, poor cemented with gravel Ø 3 ~ 5 cm, brown		CL-H	100	0			
	16						100	0			
	16.45	122.922					100	0			
	16.70	122.672		TUFF, dense, greyish brown		CL-L	100	0			
	17						100	0			
	18			CONGLOMERATIC SANDSTONE, poor cemented, brown		CL-L	100	0			
	18.80	120.572					100	0			
	19.00	120.372		TUFF, dense, greyish brown		CL-L	100	0			
	19						100	0			
	20			CONGLOMERATIC SANDSTONE, poor cemented, greyish brown		CL-L	100	0			
	21	118.272					100	0			
	22	117.072		PUMICE TUFF, dense, yellowish grey		CL-L	100	0			

Lugeon Value = 5.05
Critical Pressure = 3.83 kg/cm²

DATE	DEPTH (m)	DESCRIPTION	CLASSIFICATION	LAGOON VALUE	CRITICAL PRESSURE (kg/cm ²)
DEC. 15, 1997	15.45	CONGLOMERATE, poor cemented with gravel Ø 3-5 cm, brown	CL-H		
DEC. 16, 1997	16.70	TUFF, dense, greyish brown	CL-L		
DEC. 19, 1997	18.80	CONGLOMERATIC SANDSTONE, poor cemented, brown	CL-L	5.05	3.83
DEC. 19, 1997	19.00	TUFF, dense, greyish brown	CL-L		
DEC. 20, 1997	21.10	CONGLOMERATIC SANDSTONE, poor cemented, greyish brown	CL-L		
DEC. 22, 1997	22.30	PUMICE TUFF, dense, yellowish grey	CL-L		
DEC. 23, 1997	23.50	VOLCANIC BRECCIA, compact, grey	CM-H		
DEC. 24, 1997	24.50				
DEC. 25, 1997	25.50				
DEC. 26, 1997	26.50				
DEC. 27, 1997	27.50				
DEC. 28, 1997	28.50				
DEC. 29, 1997	29.50				
DEC. 30, 1997	30.50				
DEC. 31, 1997	31.50				
DEC. 32, 1997	32.50				
DEC. 33, 1997	33.50				
DEC. 34, 1997	34.50				
DEC. 35, 1997	35.50	CONGLTIC S' STONE, fine ~ coarse grained, compact, brown	CL-H		
DEC. 36, 1997	36.00	PUMICE TUFF, dense, greyish brown	CL-H		
DEC. 36, 1997	36.30	CONGLTIC S' STONE, c. grained, compact, brown	CL-H		
DEC. 37, 1997	37.35	TUFF, fine ~ coarse, dense, greyish brown	CL-H		
DEC. 38, 1997	39.60	SANDSTONE, med. ~ c. grained, locally incl. gravel Ø 1-2 cm, dense, brownish grey	CL-H		
DEC. 39, 1997	39.75	TUFF, dense, brownish grey	CL-H		
DEC. 39, 1997	39.10	CONGLTIC S' STONE, compact, grey	CL-H		
DEC. 39, 1997	39.30	TUFF, dense, yellowish grey	CL-H		
DEC. 39, 1997	39.30	CONGLTIC S' STONE, compact, grey	CL-H		
DEC. 39, 1997	39.80	SANDSTONE, coarse grained, dense, grey	CL-H		
DEC. 39, 1997	39.80	TUFF, SANDSTONE, fine grained, compact, grey	CL-H		
DEC. 41, 1997	41.50	PUMICE TUFF, dense, greyish brown with muddy tuff (40.40 ~ 40.60)	CL-H		
DEC. 42, 1997	42.50				
DEC. 43, 1997	43.50				
DEC. 44, 1997	44.50				
DEC. 45, 1997	45.50				

DEC. 15, 1997 DEC. 16, 1997 DEC. 19, 1997 DEC. 20, 1997 DEC. 22, 1997 DEC. 23, 1997 DEC. 24, 1997 DEC. 25, 1997 DEC. 26, 1997 DEC. 27, 1997 DEC. 28, 1997 DEC. 29, 1997 DEC. 30, 1997 DEC. 31, 1997 DEC. 32, 1997 DEC. 33, 1997 DEC. 34, 1997 DEC. 35, 1997 DEC. 36, 1997 DEC. 37, 1997 DEC. 38, 1997 DEC. 39, 1997 DEC. 41, 1997 DEC. 42, 1997 DEC. 43, 1997 DEC. 44, 1997 DEC. 45, 1997

Lagoon Value = 5.05
Critical Pressure = 3.83 kg/cm²

Lagoon Value = 1.36
Critical Pressure = 3.95 kg/cm²

Lagoon Value = 3.12
Critical Pressure = 5.95 kg/cm²

Lagoon Value = 1.93
Critical Pressure = 4.96 kg/cm²

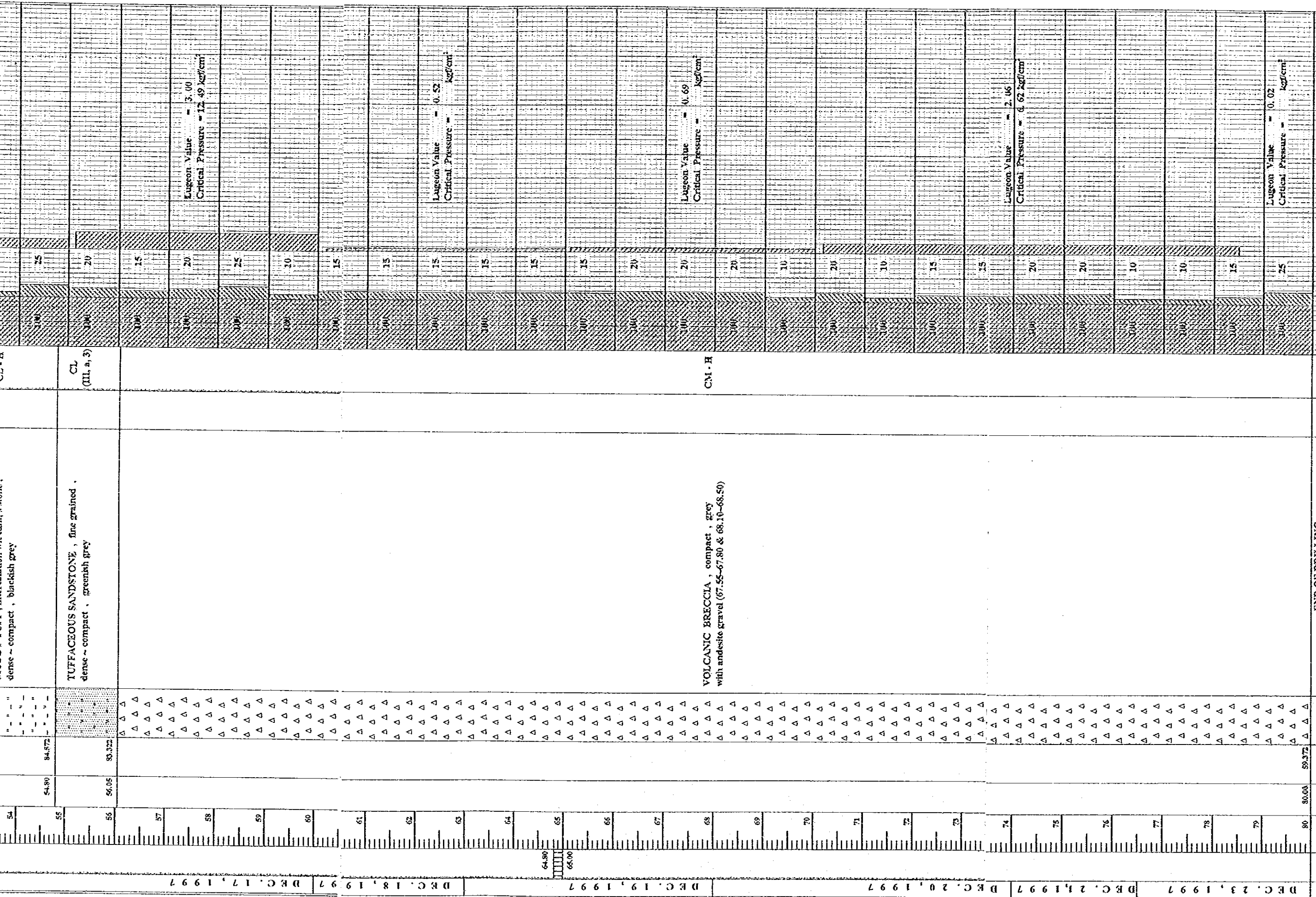
Lagoon Value = 3.06
Critical Pressure = 5.95 kg/cm²

Lagoon Value = 2.46
Critical Pressure = 5.97 kg/cm²



DEC. 13, 1997 DEC. 14, 1997 DEC. 15, 1997 DEC. 16, 1997 DEC. 17, 1997 DEC. 18, 1997

35.70	103.672	CL-H	CONGLOMERATIC SANDSTONE, tuff ~ coarse grained, compact, brown	100	30	
36.00	103.572	CL-H	PUMICE TUFF, dense, greyish brown	100	10	
36.30	103.072	CL-H	CONGLOMERATIC SANDSTONE, c. grained, compact, brown	100	20	Lugeon Value = 3.06 Critical Pressure = 5.95 kgf/cm²
37.55	102.022	CL-H	TUFF, fine ~ coarse, dense, greyish brown	100	25	
38.60	100.772	CL-H	SANDSTONE, med. ~ c. grained, locally incl. gravel Ø 1 ~ 2 cm, dense, brownish grey	100	30	
38.75	100.622	CL-H	TUFF, dense, brownish grey	100	0	Lugeon Value = 2.46 Critical Pressure = 5.97 kgf/cm²
39.10	100.472	CL-H	CONGLOMERATIC SANDSTONE, compact, grey	100	25	
39.30	100.072	CL-H	TUFF, dense, yellowish grey	100	25	
39.50	99.972	CL-H	CONGLOMERATIC SANDSTONE, compact, grey	100	15	
39.80	99.872	CL-H	SANDSTONE, coarse grained, dense, grey	100	35	
39.90	99.472	CL-H	TUFF SANDSTONE, fine grained, compact, grey	100	25	Lugeon Value = 2.05 Critical Pressure = 5.99 kgf/cm²
41.50	97.972	CL-H	PUMICE TUFF, dense, greyish brown with muddy tuff (40.40 ~ 40.60)	100	30	
44.55		CM-L	CONGLOMERATIC SANDSTONE, compact, grey with nearly volc. breccia (43.30 ~ 43.40) and coarse sandstone (45.10 ~ 45.30)	100	15	
45.70				100	35	
48.40				100	25	
48.60				100	30	
50.05	89.372	CL-H	TUFF SANDSTONE, laminated observed, fine grained, dense ~ compact, greyish brown	100	15	
51.26		CL-H	CONGLOMERATE, with gravel, brownish grey	100	20	
51.46		CL-H	SILTSTONE, dense ~ compact, black	100	20	Lugeon Value = 1.40 Critical Pressure = 5.12 kgf/cm²
52.10	87.272	CL-H	MUDDY TUFF, intercalation w/ tuff, s' stone, dense ~ compact, blackish grey	100	30	
54.40	84.872	CL	TUFFACEOUS SANDSTONE, fine grained, dense ~ compact, greenish grey	100	25	
56.05	80.322	CL (II, a, 3)		100	20	
57				100	15	
58				100	20	Lugeon Value = 3.00 Critical Pressure = 12.49 kgf/cm²
59				100	25	
60				100	10	
61				100	15	
62				100	15	
63				100	15	Lugeon Value = 0.52 Critical Pressure = kgf/cm²
64				100	15	



END OF DRILLING

R. Q. D. = Rock Quality Designation = (Total Length of Cylindric Cores longer than 10 cm) / (Total Core Length) x 100 %

LUGEON VALUE is ltr/min/mtr under injection water pressure by 10 kgf/cm²

G. W. L. = Ground Water Level = Height of Spring Water

PROJECT	IAIBARANG DAM		DEPTH	ELEVATION		ELEVATION			
SITE	COORDINATE X-Y-Z	DATE	INCLINATION	VERTICAL	DRILL RIG	LOGGED BY	LOGGED BY		
CLIENT	JICA	NOV. 20, 1997	DRILLED BY	RAPAI			DDIX PRANOWO		
SAMPLING	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY %	R Q D %	WATER PRESSURE TEST LUGEON VALUE
N. 30 NOV. 29, 1997				RIVER DEPOSIT, loose condition			100	0	
N. 28 NOVEMBER 26, 1997	1						100	0	
N. 28 NOVEMBER 26, 1997	2						100	0	
N. 28 NOVEMBER 26, 1997	3						100	0	
N. 28 NOVEMBER 26, 1997	4						100	0	
N. 28 NOVEMBER 26, 1997	5	87.958					100	0	
N. 28 NOVEMBER 26, 1997	6	87.488		CONGLUTIC SANDSTONE, soft - dense, brownish grey		CL - H	100	10	
N. 28 NOVEMBER 26, 1997	7	86.558		SANDSTONE, medium grained, dense, grey		CL - H	100	24	
N. 28 NOVEMBER 26, 1997	8						100	25	
N. 28 NOVEMBER 26, 1997	9						100	65	
N. 28 NOVEMBER 26, 1997	10			VOLCANIC BRECCIA, compact, grey		CM - H	100	26	
N. 28 NOVEMBER 26, 1997	11	81.758					100	23	
N. 28 NOVEMBER 26, 1997	12	81.358		SANDY TUFF, dense, light grey		CL - H	100	24	
N. 28 NOVEMBER 26, 1997	13						100	23	
N. 28 NOVEMBER 26, 1997	14			VOLCANIC BRECCIA, compact, grey		CM - H	100	20	
N. 28 NOVEMBER 26, 1997	15	77.858					100	25	
N. 28 NOVEMBER 26, 1997	16	76.958		TUFF SANDSTONE, coarse grained, dense, grey		CL - H	100	0	
N. 28 NOVEMBER 26, 1997	17						100	20	
N. 28 NOVEMBER 26, 1997	18						100	19	
N. 28 NOVEMBER 26, 1997	19			VOLCANIC BRECCIA, compact, grey		CM - H	100	10	
N. 28 NOVEMBER 26, 1997	20	72.958					100	30	

END OF DRILLING
 * R. Q. D. = Rock Quality Designation = (Total Length of Cylindric Cores longer than 10 cm) / (Total Core Length) x 100 %
 * LUGEON VALUE is trombita/m² under injection water pressure by 10 kgf/cm²
 * G. W. L. = Ground Water Level = Height of Spring Water



PT. Indra Karya (Persero)
Consulting Engineers

Fig. 1.1.21 DRILL LOG

HOLE No. E - 22

PROJECT SITE	DATE/ARANG/DAM		COORDINATE X : 927.39205 Y : 428.359236 DATE : Dec. 28. 1997 (88 Dec. 17. 1997)	DEPTH		ELEVATION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY %	R Q D %	WATER PRESSURE TEST LUGEON VALUE												
	DAMSITE			VERTICAL	RAJAL							DRILL RIG	LOGGED BY	50	20	10	0							
	JICA	DATE		RAJAL	LOGGED BY							DIDA PRANOWO												
CLIENT	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY %	R Q D %	50	20	10	0	50	20	10	0	40	30	20	10	0	50		
17 DECEMBER 14, 1997	20.00	81.013	△△△△△	R. DEPOSITE, sand & gravel content, loose, grey	△		100	28	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	
16 DECEMBER 14, 1997			△△△△△	VOLCANIC BRECCIA, compact, grey			100	15	100	15	100	15	100	15	100	15	100	15	100	15	100	15	100	
15 DECEMBER 13, 1997			△△△△△					100	10	100	10	100	10	100	10	100	10	100	10	100	10	100	10	100
14 DECEMBER 13, 1997			△△△△△					80	0	90	0	90	0	100	0	100	0	100	0	100	0	100	0	100
13 DECEMBER 13, 1997			△△△△△					90	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100
12 DECEMBER 13, 1997			△△△△△					100	22	100	22	100	22	100	22	100	22	100	22	100	22	100	22	100
11 DECEMBER 12, 1997			△△△△△					100	20	100	20	100	20	100	20	100	20	100	20	100	20	100	20	100
10 DECEMBER 11, 1997			△△△△△					100	18	100	18	100	18	100	18	100	18	100	18	100	18	100	18	100
9 DECEMBER 11, 1997			△△△△△					100	15	100	15	100	15	100	15	100	15	100	15	100	15	100	15	100
8 DECEMBER 10, 1997			△△△△△					100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100
7 DECEMBER 10, 1997			△△△△△					100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100
6 DECEMBER 10, 1997			△△△△△				100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	
5 DECEMBER 10, 1997			△△△△△				100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	
4 DECEMBER 09, 1997			△△△△△				100	13	100	13	100	13	100	13	100	13	100	13	100	13	100	13	100	
3 DECEMBER 09, 1997			△△△△△				100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	
2 DECEMBER 09, 1997			△△△△△				100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	
1 DECEMBER 08			△△△△△				100	28	100	28	100	28	100	28	100	28	100	28	100	28	100	28	100	

END OF DRILLING

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 * LUGEON VALUE is kN/m²/m under injection water pressure by 10 kg/cm²
 * G. W. L. = Ground Water Level = Height of Spring Water