



PT. Indra Karya (Persero)
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Fig. 2.1.15 DRILL LOG

HOLE No. RRD - 4

DATE	SAMPLING	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO. VERY %	R. Q. D %	STANDARD PENETRATION TEST	
										DEPTH	INCLINATION
PROJECT: JAMBANG DAM SITE: RESERVOIR CLIENT: JICA COORDINATE: X=221604982 Y=428117302 DATE: Jan. 09, 1998 till Jan. 11, 1998 DEPTH: 30.00 M ELEVATION: 143.950 M DRILL RIG: YEN YSO-2 LOGGED BY: SUPRIYADI											
JANUARY 09, 1998											
	1	1.50	142.450		TUFF. SANDSTONE, c. grained, p. cemented, brown		CL-L	100	0	N=7X	
	2			OVOVO	VOLC CONGL'RATE (Ø > 3 cm), poor cemented, greyish brown		CL-L	100	0	N=11X	
	3	3.00	140.950	OVOVO	VOLC CONGL'RATE (Ø max. 15 cm), p. cemented, greyish brown		CL-L	100	0	N=10X	
	4	4.50	139.450	OVOVO	VOLC CONGL'RATE (Ø > 3 cm), poor cemented, greyish brown		CL-L	100	0	N=9X	
	5	6.00	137.950	OVOVO	CONGL'TIC S'STONE, p. cemented, greyish brown		CL-L	100	0	N=14X	
	6	6.40	137.550	OVOVO			CL-L	100	0	N=12X	
	7			OVOVO	VOLC CONGL'RATE (Ø max. 20 cm), p. cemented, greyish brown		CL-L	100	0	N=12X	
	8			OVOVO			CL-L	100	0	N=16X	
	9			OVOVO			CL-L	100	0	N=18X	
	10			OVOVO			CL-L	100	0	N=19X	
	11	11.20	132.750	OVOVO	TUFF. S'STONE, soft, c. grained, dark grey		CL-L	100	0	N=21X	
	12			OVOVO			CL-L	100	0	N=22X	
	13	13.50	130.450	OVOVO	CONGL'TIC S'STONE, c. grained, p. cemented, greyish brown		CL-L	100	0	N=24X	
	14			OVOVO			CL-L	100	0	N=19X	
	15	14.00	129.050	OVOVO	CONGLOMERATE, poor cemented, greyish brown		CL-L	100	0	N=24X	
	16	16.20	127.750	OVOVO	VOLC. CONGL'RATE, matrix fine sandstone, light brown		CL-L	100	0	N=15X	
	17			OVOVO			CL-L	100	0	N=21X	
	18	18.00	125.950	OVOVO	TUFFACEOUS SANDSTONE, coarse grained, soft, light brown		CL-L	100	0	N=16X	
	19	19.00	124.950	OVOVO			CL-L	100	0	N=24X	
	20			OVOVO			CL-L	100	0	N=19X	
	21			OVOVO	TUFFACEOUS SANDSTONE, fine - med. grained, soft, light brown		CL-L	100	0	N=21X	
	22	22.00	121.950	OVOVO			CL-L	100	0	N=24X	
				OVOVO			CL-L	100	0	N=16X	
JANUARY 10, 1998											

Depth (m)	Soil Description	Soil Type	Penetration Test (N)	Notes
5	VOLC CONGL'RATE (Ø > 3 cm), poor cemented, greyish brown	CL-L	5X	
6	CONGL'TIC S'STONE, p. cemented, greyish brown	CL-L	14X	
7	VOLC CONGL'RATE (Ø max 20 cm), p. cemented, greyish brown	CL-L	12X	
8				
9				
10				
11				
12	TUFF. S'STONE, soft, c. grained, dark grey	CL-L	18X	
13				
14	CONGL'TIC S'STONE, c. grained, p. cemented, greyish brown	CL-L	21X	
15	CONGLOMERATE, poor cemented, greyish brown	CL-L	22X	
16				
17	VOLC. CONGL'RATE, matrix fine sandstone, light brown	CL-L	24X	
18	TUFFACEOUS SANDSTONE, coarse grained, soft, light brown	CL-L	15X	
19				
20				
21	TUFFACEOUS SANDSTONE, fine-med. grained, soft, light brown	CL-L	26X	
22				
23				
24				
25	SILTSTONE with some gravel Ø max 5 cm, soft, blackish grey	CL-L	19X	
26				
27				
28				
29	SILTSTONE - MUDSTONE, soft-stiff, bluish grey	CL-L	29X	
30				

END OF DRILLING

R. Q. D. = Rock Quality Designation = (Total Length of Cylindric Cores longer than 10 cm) / (Total Core Length) x 100 %
 S. P. T. = Standard Penetration Test (Times Blows)
 G.W. L. = Ground Water Level = Height of Spring Water



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Fig. 2.1.16 DRILL LOG

HOLE No. RRD - 5

DATE	DEPTH	ELEVATION	COLUMN SECTION	DESCRIPTION	GROUND WATER LEVEL	ROCK GRADE	CORE RECO VERY		R. Q. D		STANDARD PENETRATION TEST
							%	%	%	%	
DECEMBER 29, 1997	0.40	163.680		TOP SOIL			100	0	0	0	
	1						100	0	0	0	N=7X
	2						100	0	0	0	N=14X
	3						100	0	0	0	N=14X
	4						100	0	0	0	N=14X
	5						100	0	0	0	N=17X
	6						100	0	0	0	N=16X
	7						100	0	0	0	N=20X
	8	8.04	161.080			CL-L	100	0	0	0	N=14X
	9						100	0	0	0	N=16X
	10						100	0	0	0	N=14X
	11	10.50	158.580				100	0	0	0	N=10X
	12	12.00	157.080				100	0	0	0	N=13X
	13	12.70	156.880				100	0	0	0	N=14X
	14						100	0	0	0	N=17X
	15						100	0	0	0	GRAVEL N=37X
	16						100	0	0	0	N=22X
	17						100	0	0	0	N=26X
	18						100	0	0	0	GRAVEL N=40X
	19						100	0	0	0	N=26X
	20						100	0	0	0	N=19X
	21						100	0	0	0	GRAVEL N=33X

CONGL. TIC SANDSTONE (tuffaceous) Ø max. 2 cm ,
poor cemented , light brown

VOLC. CONGL. RATE (Ø max. 5 cm) , P. cemented ,
light brown

TUFF. SILTSTONE , soft ~ stiff , greyish brown

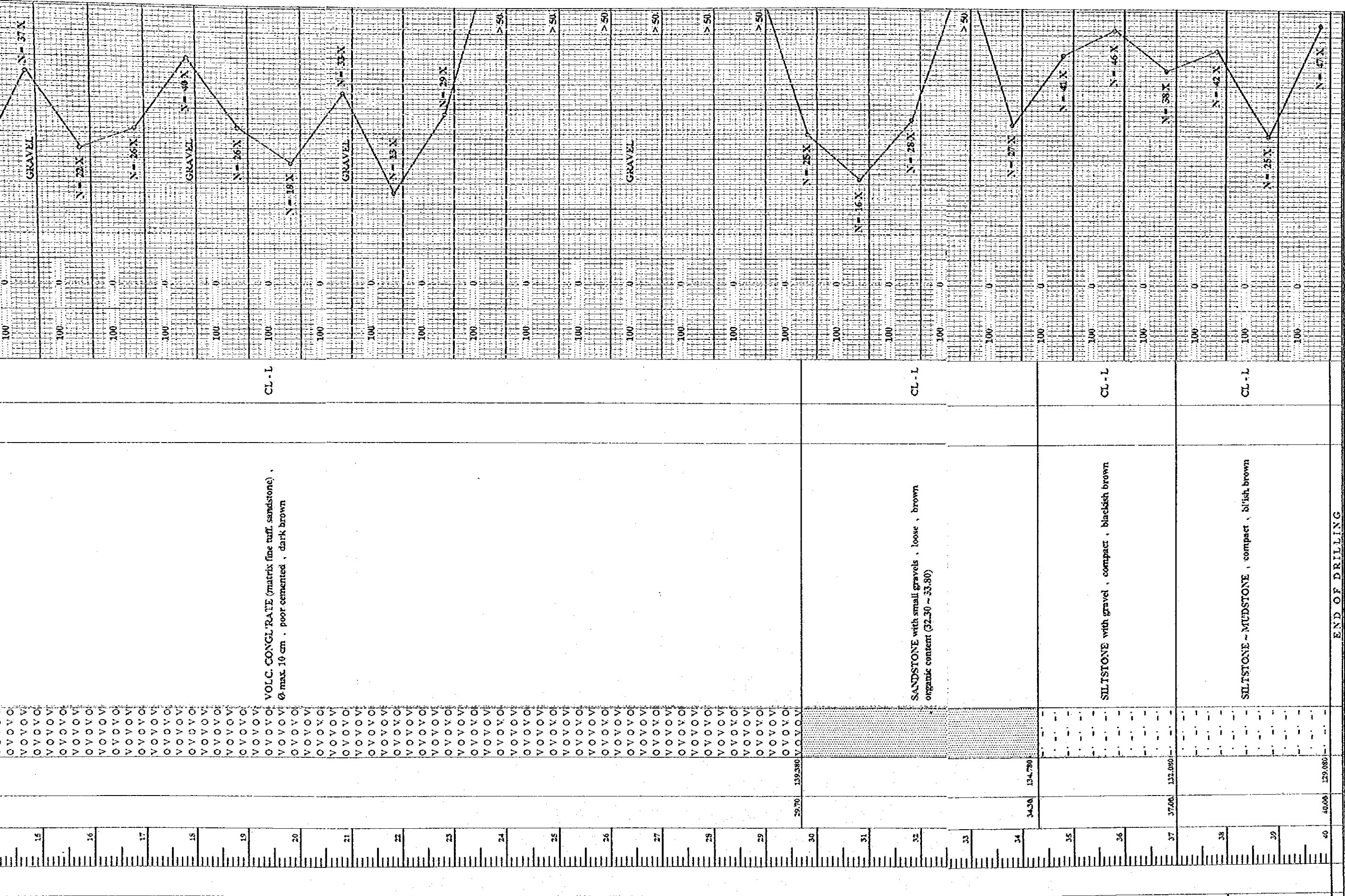
SANDSTONE , f. grained , dense , greyish brown

VOLC. CONGL. RATE (matrix fine tuff. sandstone) ,
Ø max. 10 cm , poor cemented , dark brown

DECEMBER 29, 1997

DECEMBER 30, 1997

7



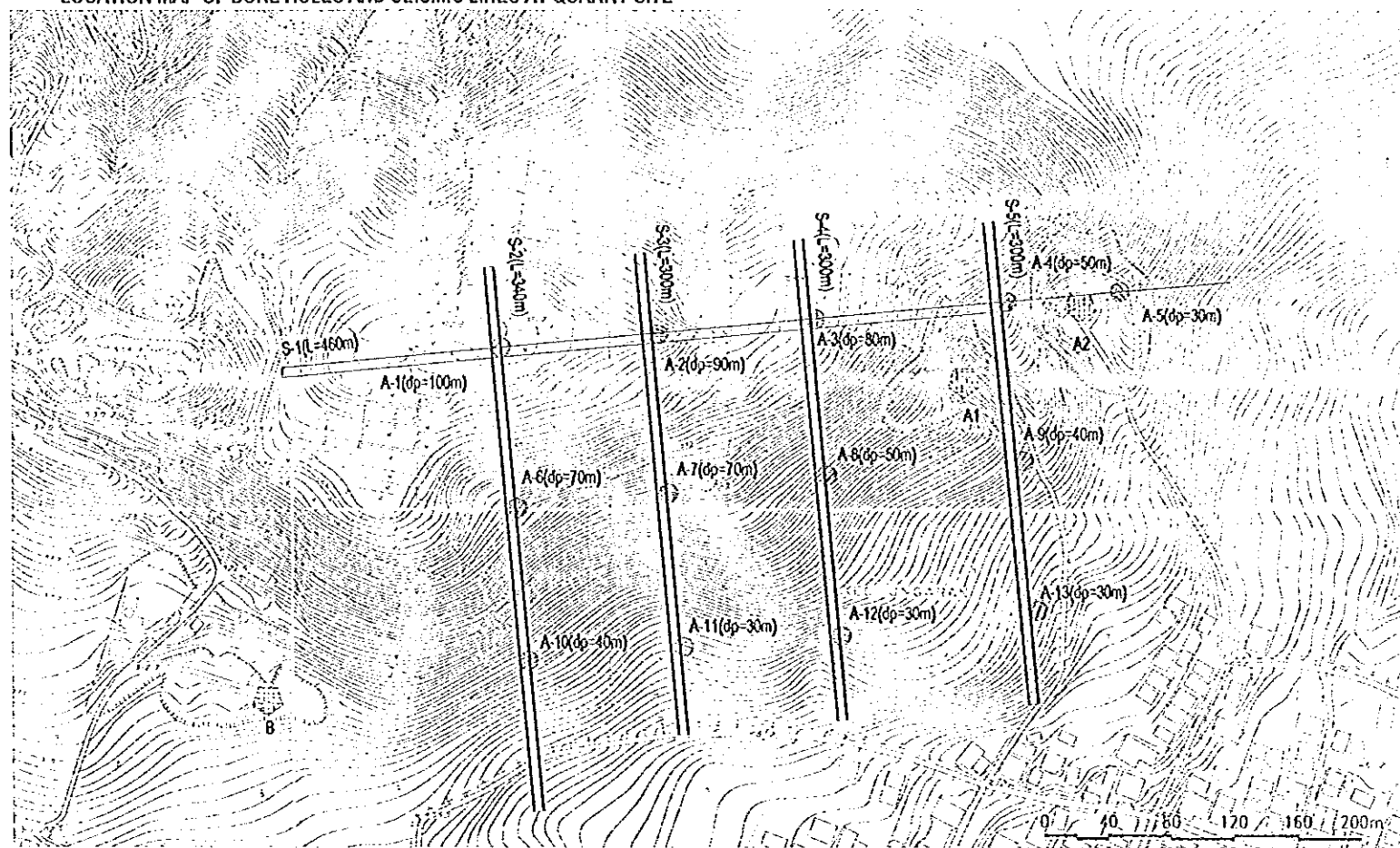
END OF DRILLING

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

* S. P. T. = Standard Penetration Test (Times Blows)

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

LOCATION MAP OF BORE HOLES AND SEISMIC LINES AT QUARRY SITE



LEGEND

(Geological Strata)

Age	Formation and Strata Name	Symbol	Description
Tertiary-Quaternary	Andesite	An	Andesite consists of sheet or dike, which is mainly composed of Plagioclase, Pyroxene and Ore minerals, and shows dark gray. But it was changed in quality partly by the hydrothermal alteration, and secondary minerals that consist of Chlorite, Mordenite and Illite were formed, and show greenish light gray. The hardness of rock is comparatively high, and the bedrock has cracks with the interval of 10 to 200 cm.
Quaternary	Pyroclastic Rock	Kp	Pyroclastic rock mainly consists of volcanic breccia and partly contains mafic tuff and andesite lava. Volcanic breccia contains fragments of andesite and pumice, and matrix consists of mafic tuff. Rocks are weathered strongly, so hardness of rocks is very soft. This stratum is covered by andesite sheet.

- HOLE NUMBER(TOTAL DEPTH) BORING POINT
- LINE NAME(TOTAL LENGTH) SEISMIC LINE
- SAMPLE NUMBER SAMPLING POINT FOR AGGREGATE TESTS

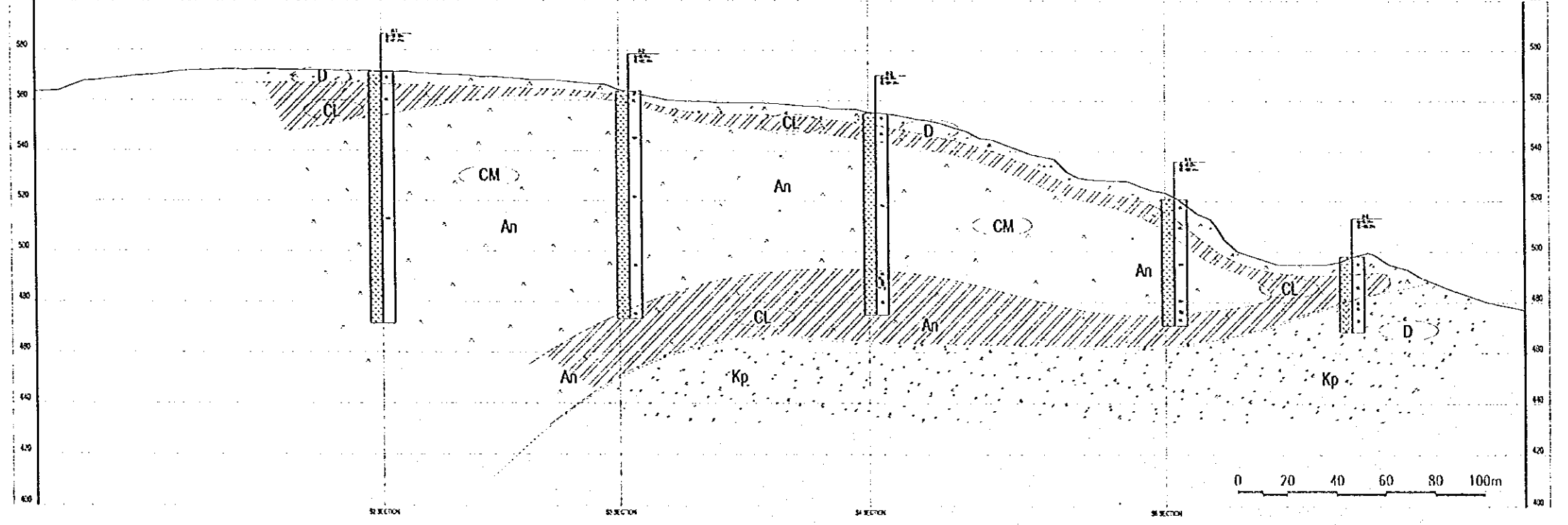
(Note)

- Boundary of Geological Strata
- Boundary of Rock Class

(SYMBOLS OF ROCKS AND ROCK CLASS)

	An	Andesite Sheet	D	D Class
	Py	Pyroclastic Rock	CL	CL Class
	La	Andesite Lava	CM	CM Class
			CH	CH Class

GEOLOGICAL PROFILE ALONG S1 LINE



THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 3.1.1 BOREHOLE LOCATION AND LINE SEISMIC FOR QUARRY SITE

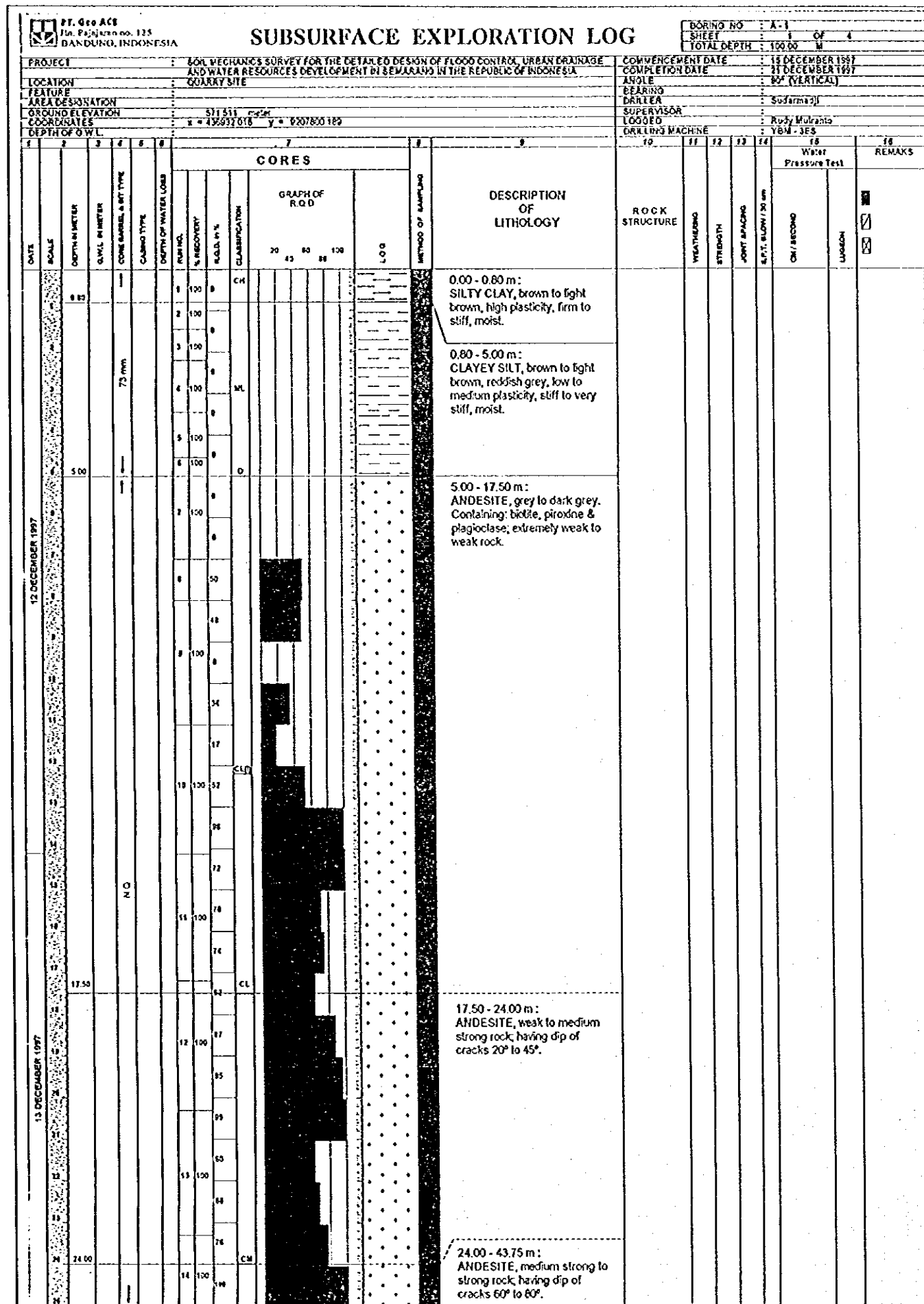


Fig. 3.1.2 Surface Exploration Log No. A - 1 (1 of 4)

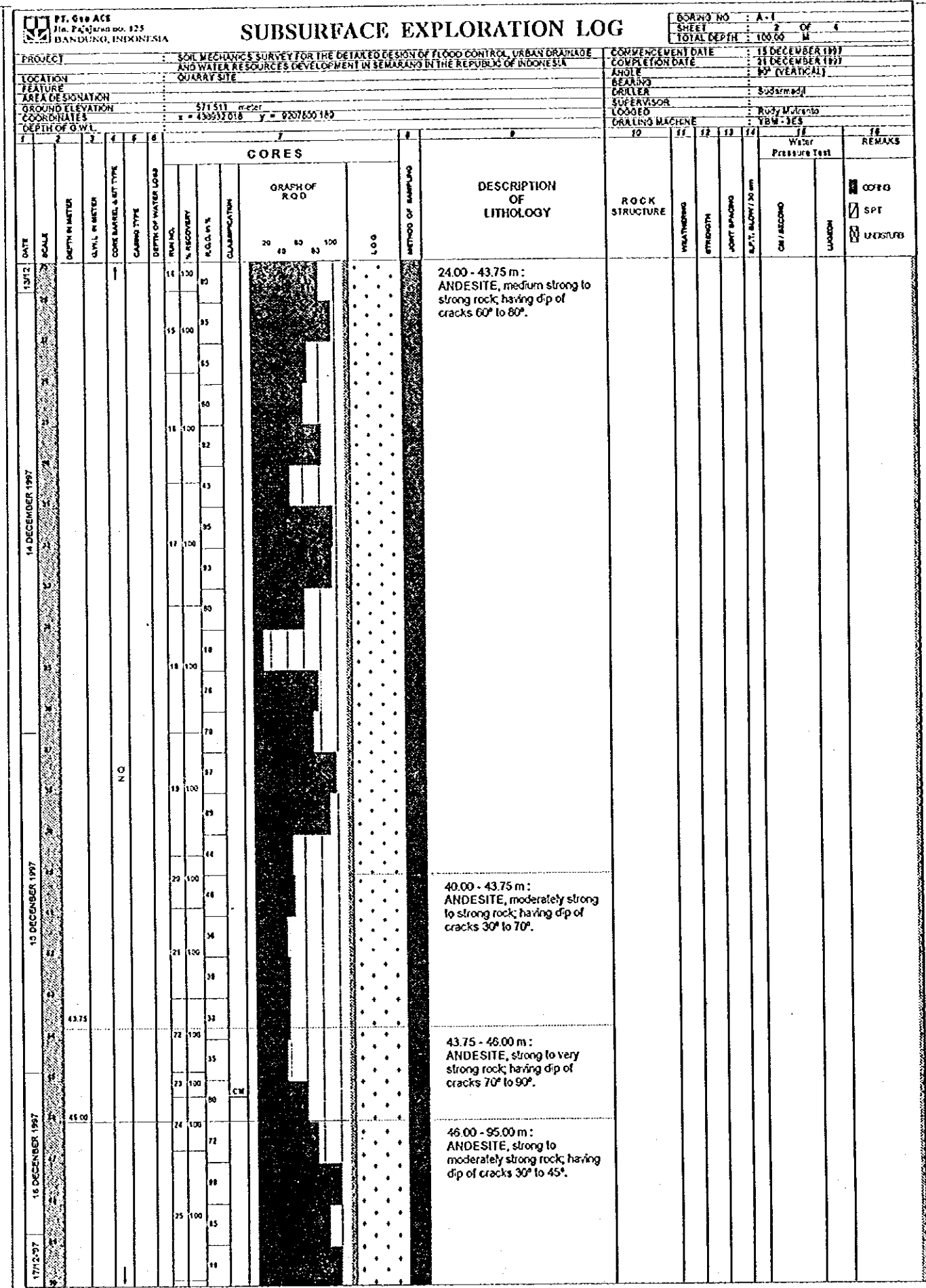


Fig. 3.1.2 Surface Exploration Log No. A - 1 (2 of 4)

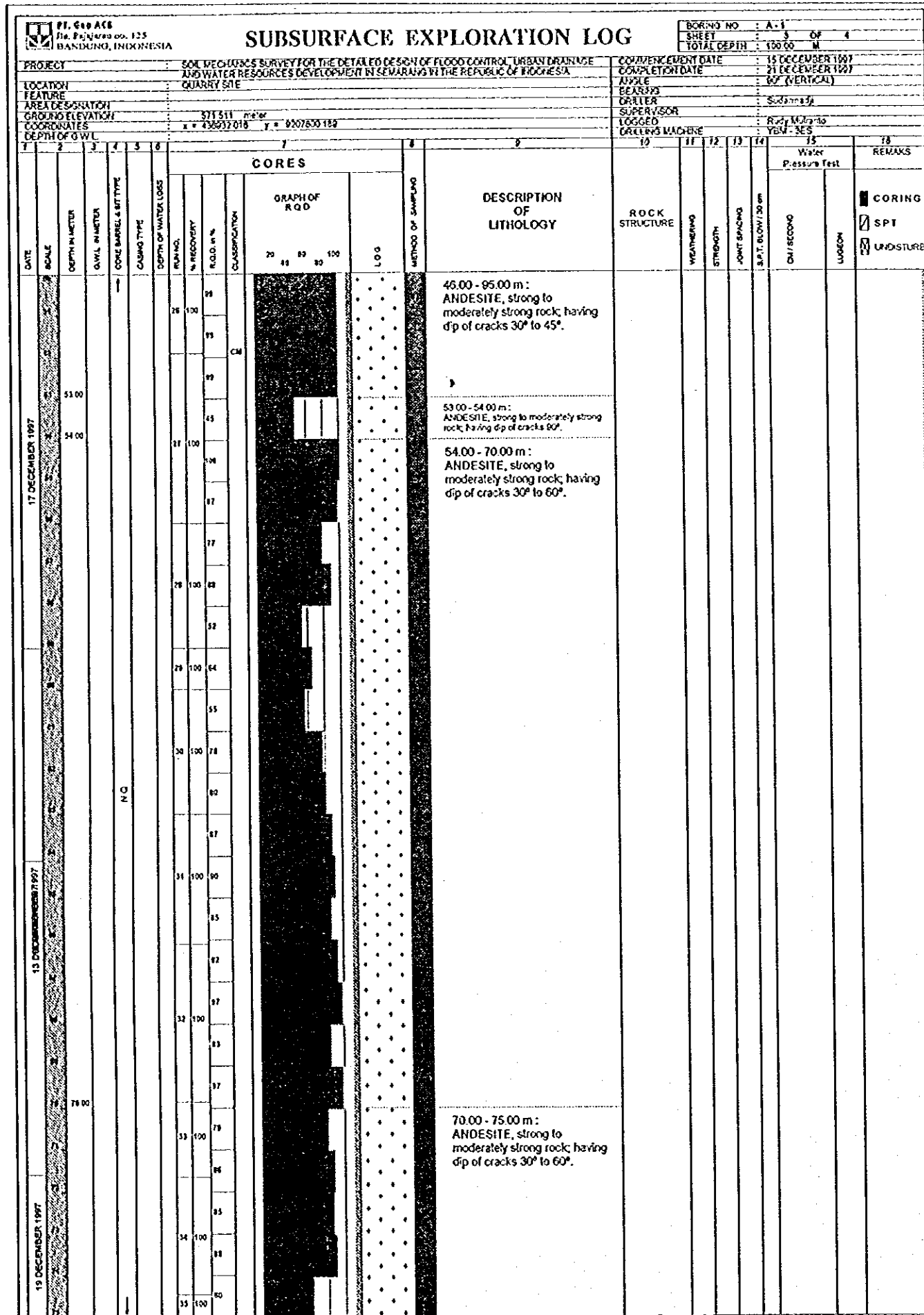


Fig. 3.1.2 Surface Exploration Log No. A - 1 (3 of 4)

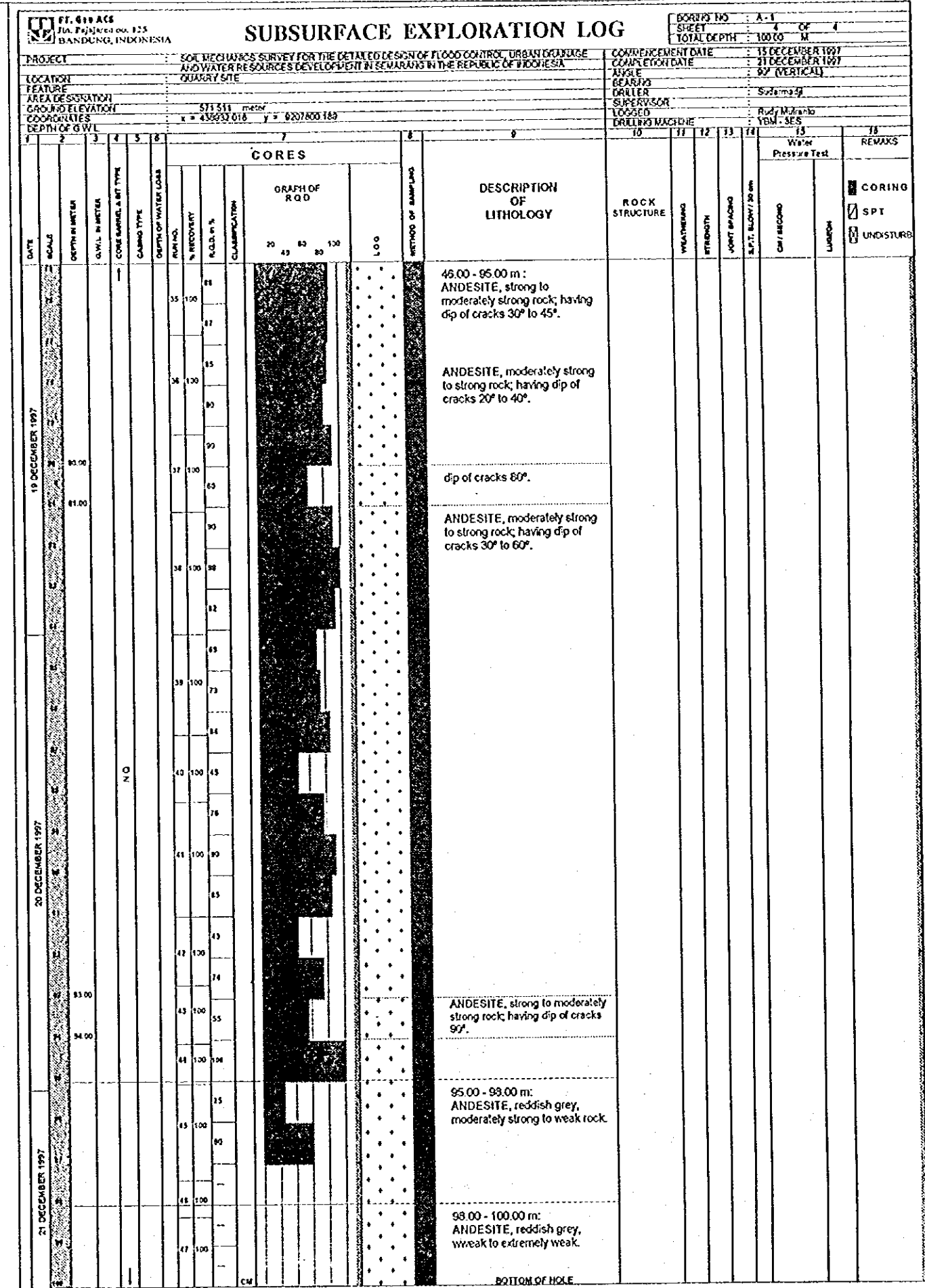


Fig. 3.1.2 Surface Exploration Log No. A - 1 (4 of 4)

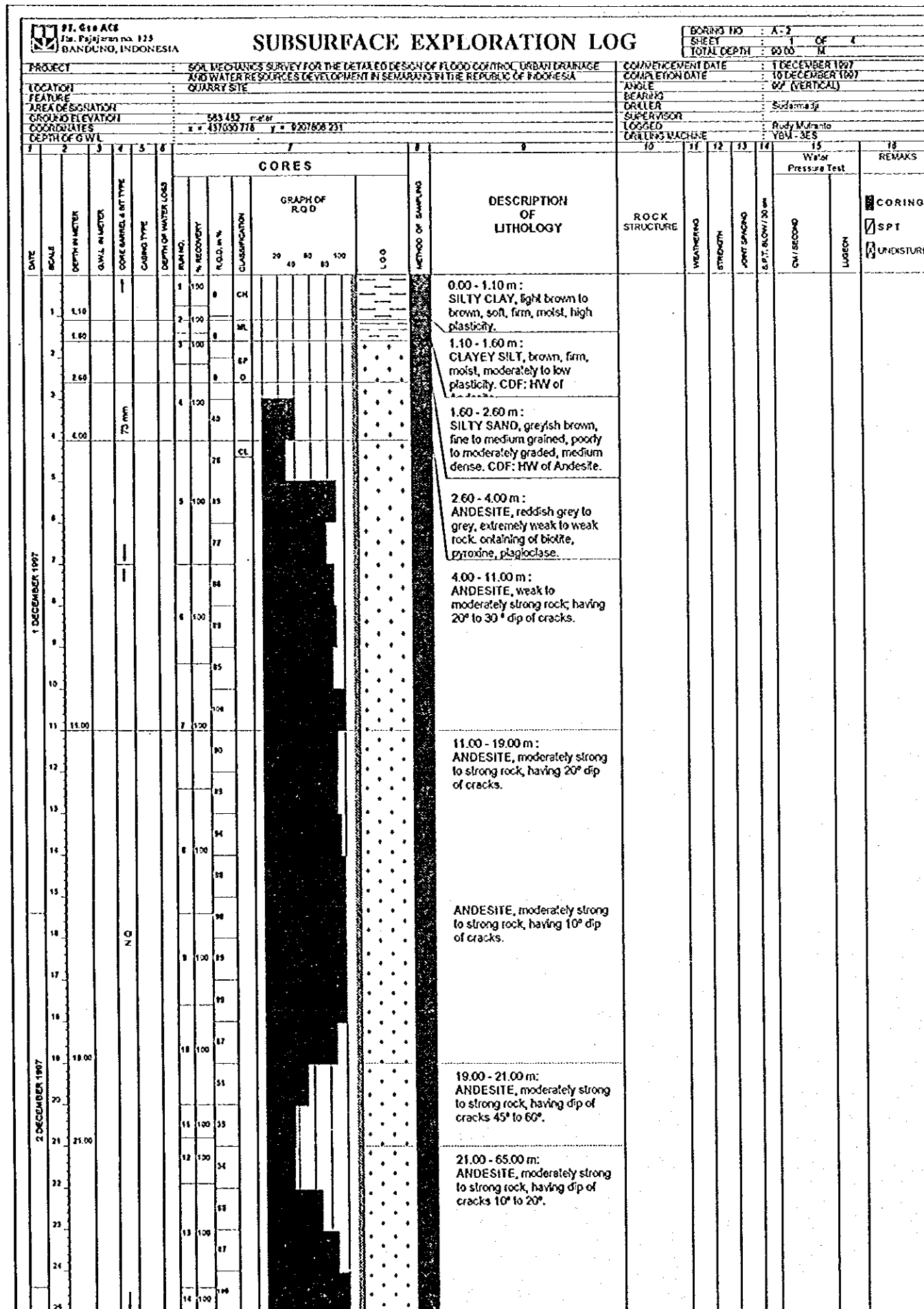


Fig. 3.1.3 Surface Exploration Log No. A - 2 (1 of 4)

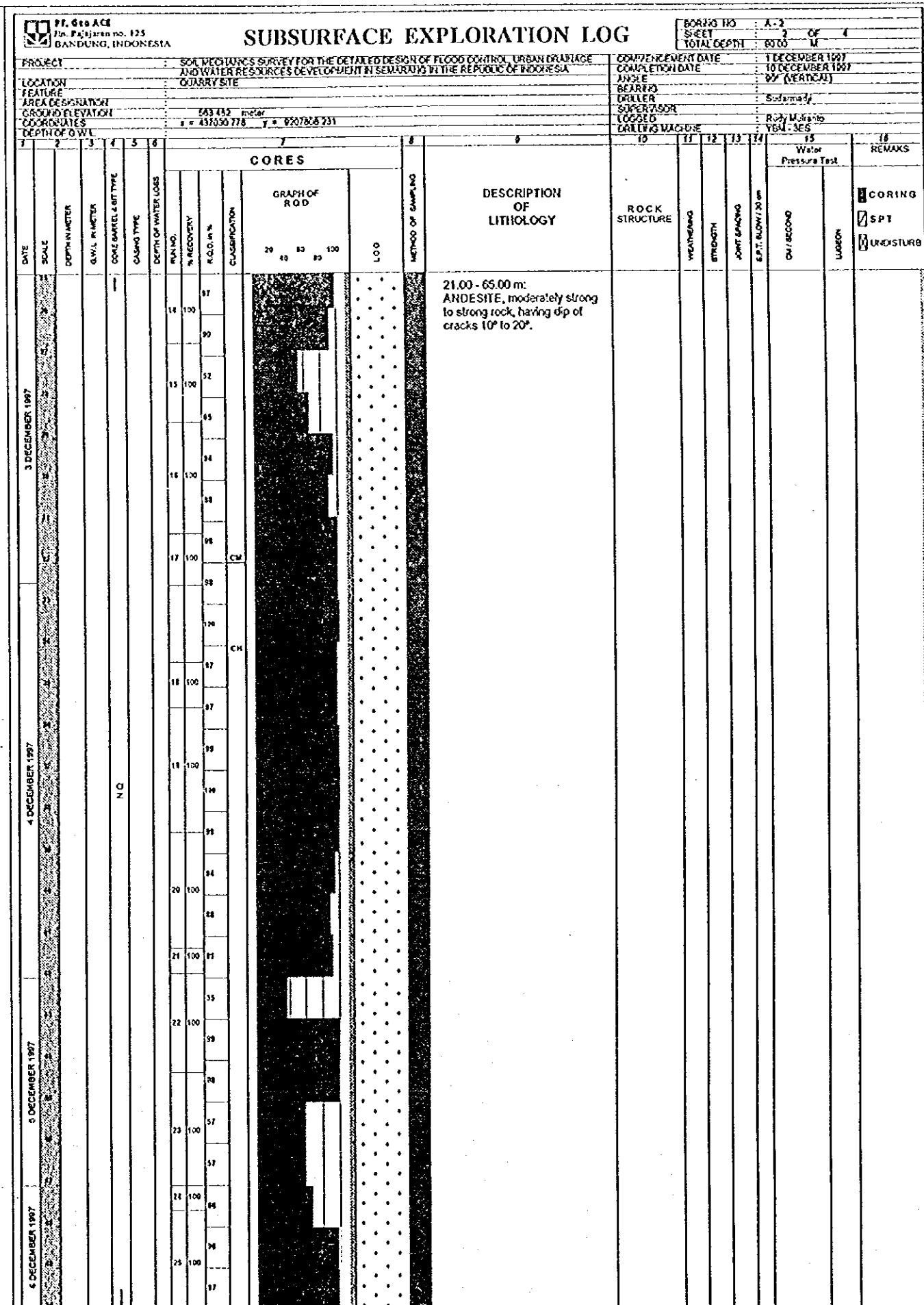


Fig. 3.1.3 Surface Exploration Log No. A - 2 (2 of 4)

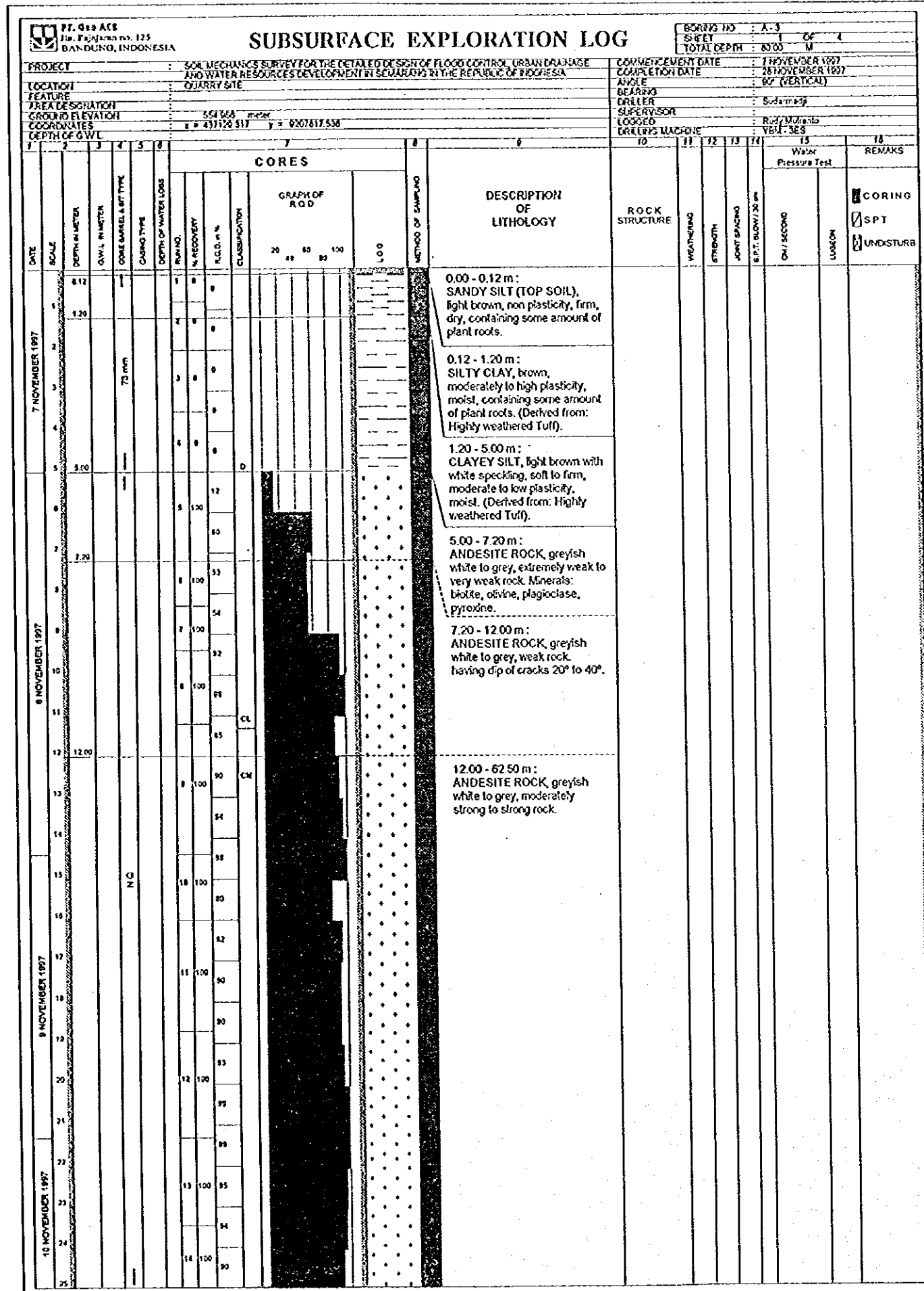


Fig. 3.1.4 Surface Exploration Log No. A - 3 (1 of 4)

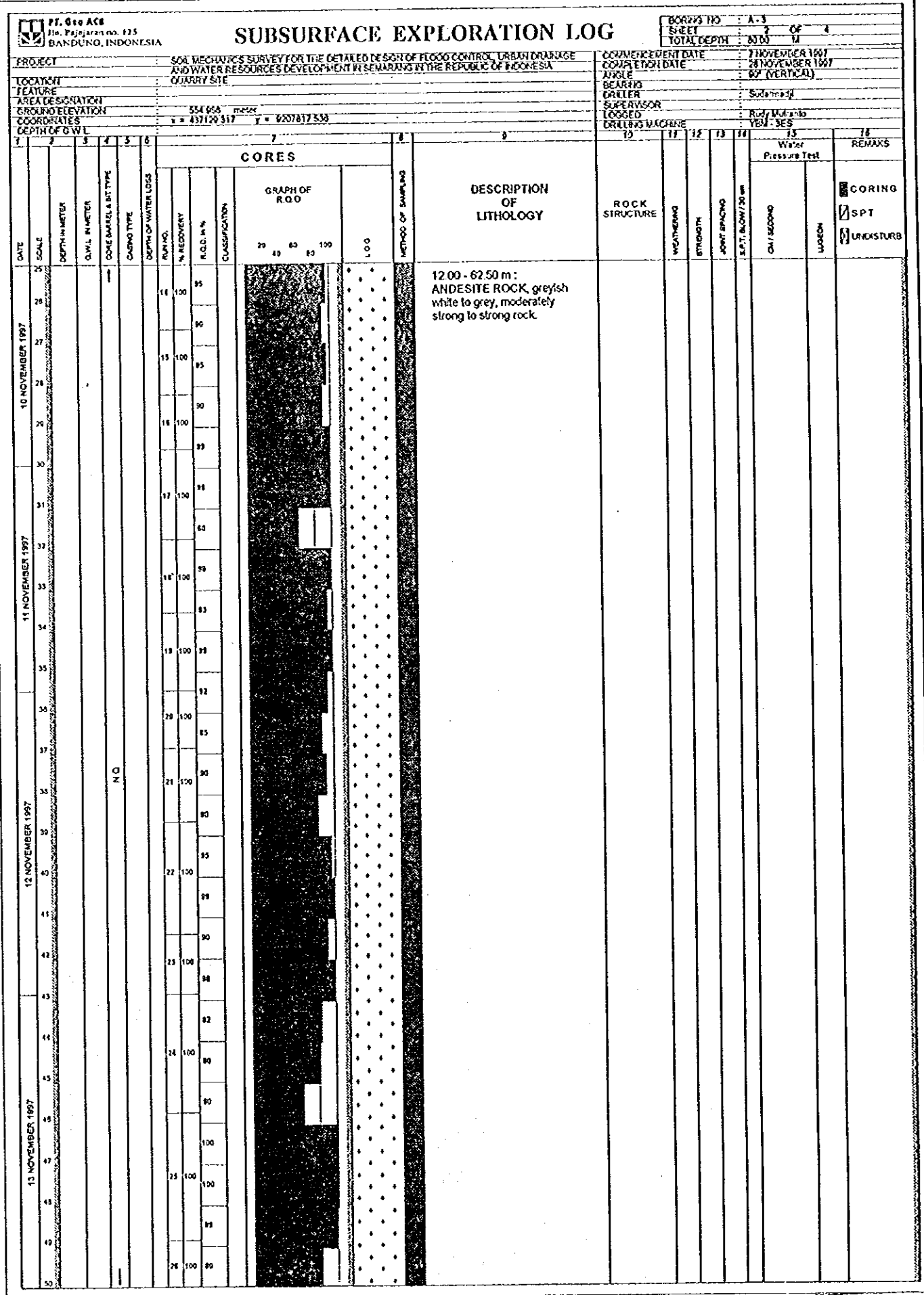


Fig. 3.1.4 Surface Exploration Log No. A - 3 (2 of 4)

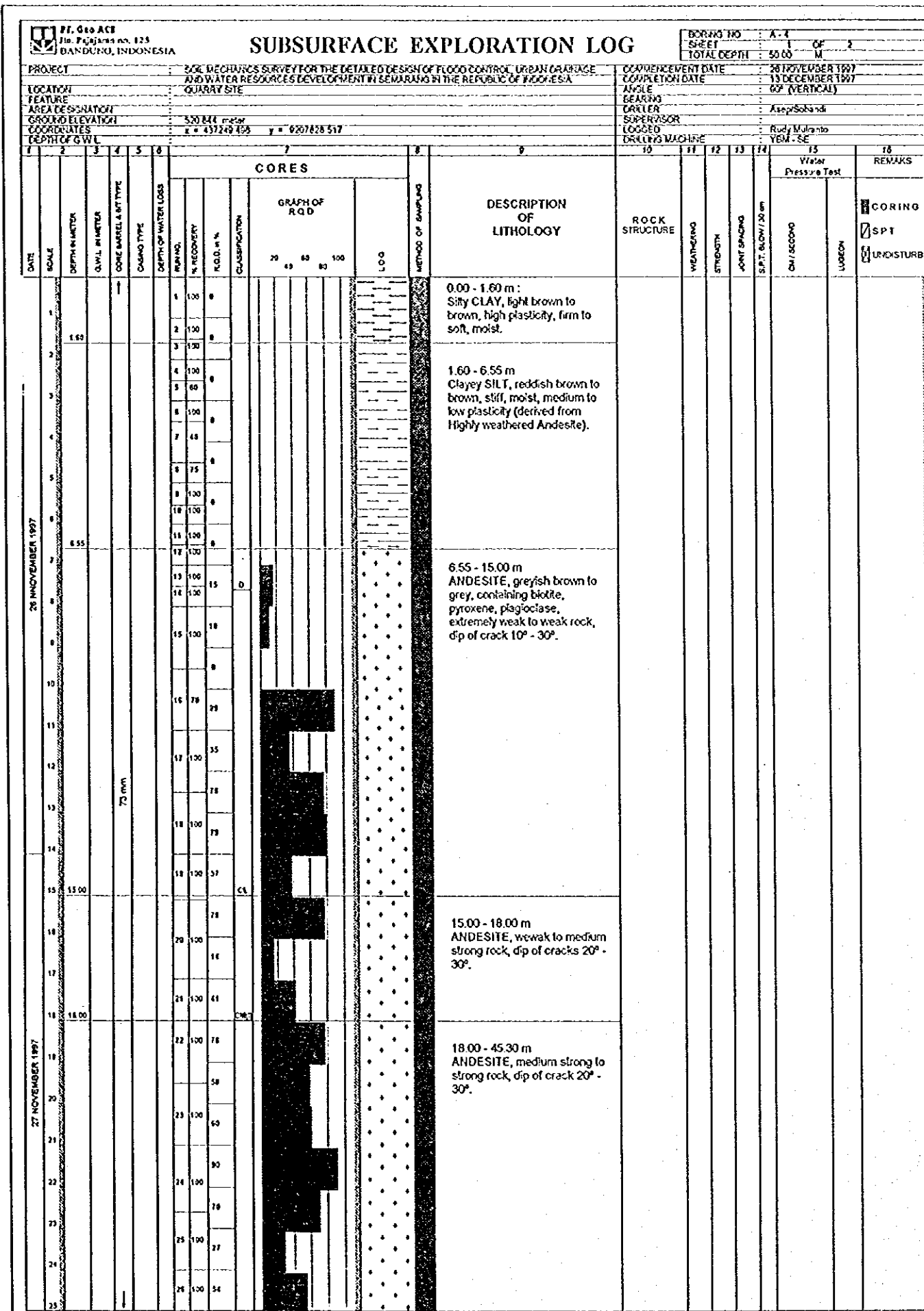


Fig. 3.1.5 Surface Exploration Log No. A - 4 (1 of 2)

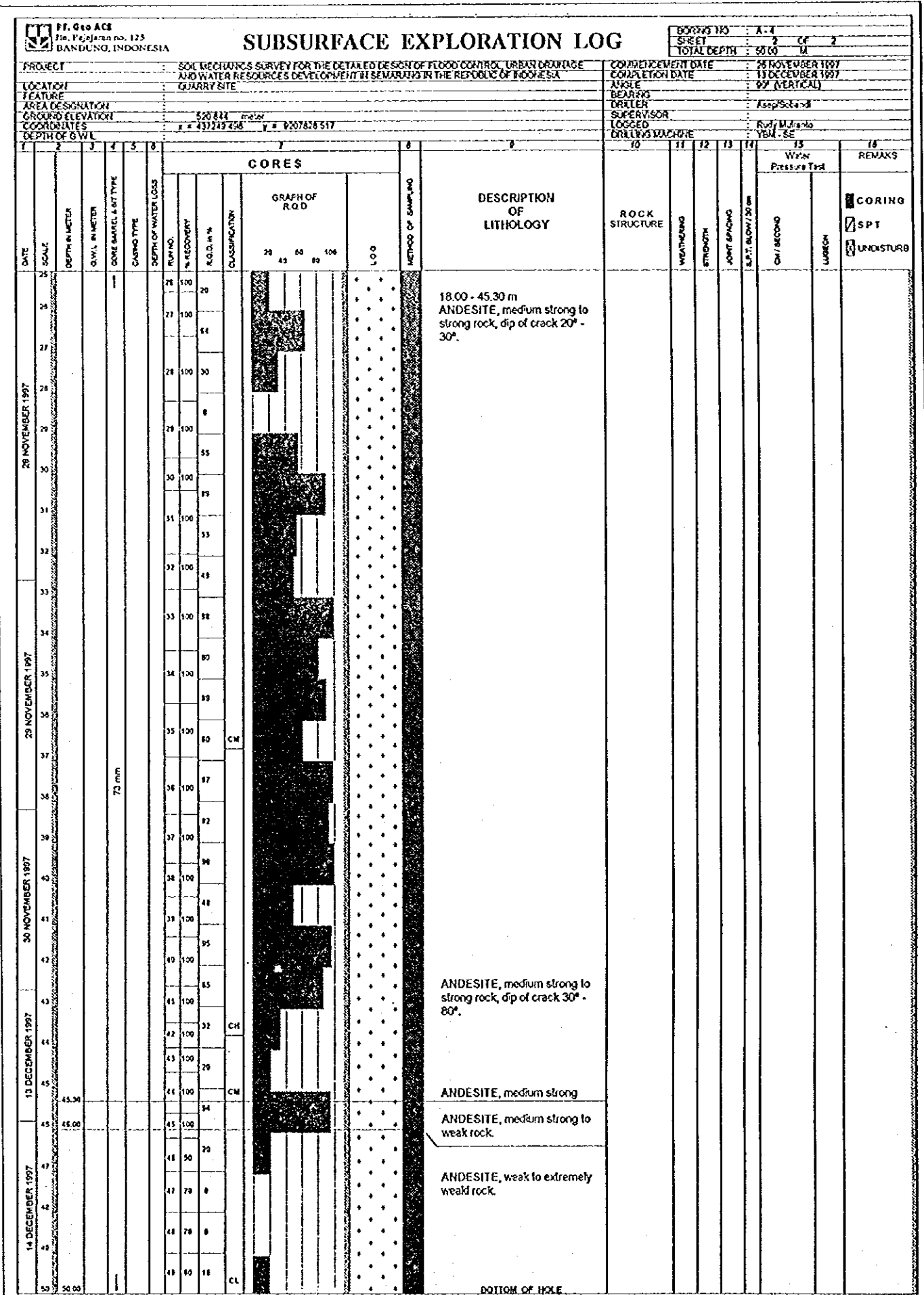


Fig. 3.1.5 Surface Exploration Log No. A - 4 (2 of 2)

SUBSURFACE EXPLORATION LOG

PROJECT: SOIL MECHANICS SURVEY FOR THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 LOCATION: QUARRY SITE
 AREA DESIGNATION: 438 254 meter
 GROUND ELEVATION: 438 254 meter
 COORDINATES: x = 437320.527 y = 9207834.635
 DEPTH OF G.W.L.

COMPLETION DATE: 21 November 1997
 COMMENCEMENT DATE: 21 November 1997
 ANGLE: 89° (VERTICAL)
 BEARING: Asap
 DRILLER: Rudy Murni
 SUPERVISOR: Rudy Murni
 LOGGED: YEM - 3E
 DRILLING MACHINE: YEM - 3E

DATE	SCALE	DEPTH IN METERS	G.W.L. IN METERS	CORE BARREL & BIT TYPE	CASING TYPE	DEPTH OF WATER LOSS	CORES				METHOD OF SAMPLING	DESCRIPTION OF LITHOLOGY	ROCK STRUCTURE	WEATHERING	STRENGTH	JOINT SPACING	S.P.T. BLOW/30 cm	CUTTING	LOGGING	REMARKS		
							NO.	RECOVERY %	R.O.D. IN %	CLASSIFICATION												
21 NOVEMBER 1997	1:50	1	100	73 mm			1	100	0	ML	0.00 - 1.55 m Gravelly SILT, light brown, no-plasticity, moist. Gravel: sub-rounded to sub-angular with diameter up to 3 cm.											
		2	100				0	ML														
		3	100				0	ML														
		4	100				0	ML														
		5	100				0	ML														
		6	100				0	ML														
		7	100				0	CH														
		8	100				0	CH														
		9	100				0	CH														
		10	100				0	CH														
22 NOVEMBER 1997	1:50	11	100	73 mm			11	100	0	SP	1.55 - 6.05 m Silty CLAY, reddish brown, firm to stiff, high plasticity, moist (derived from highly weathered andesite).											
		12	100				0	SP														
		13	100				0	SP														
		14	100				0	SP														
		15	100				0	SP														
		16	100				0	SP														
		17	100				0	SP														
		18	100				0	SP														
		19	100				0	SP														
		20	100				0	SP														
23 NOVEMBER 1997	1:50	21	100	73 mm			21	100	0	CL	6.05 - 6.60 m Gravelly SAND, greyish brown, fine to medium grained, poorly graded, loose to medium dense, poorly cemented (derived from highly weathered andesite).											
		22	100				0	CL														
		23	100				0	CL														
		24	100				0	CL														
		25	100				0	CL														
		26	100				0	CL														
		27	100				0	CL														
		28	100				0	CL														
		29	100				0	CL														
		30	100				0	CL														
24 NOVEMBER 1997	1:50	31	100	73 mm			31	100	0	CL	6.60 - 22.35 m ANDESITE, grey to brownish grey, extremely weak rock, containing biotite, plagioclase, pyroxene.											
		32	100				0	CL														
		33	100				0	CL														
		34	100				0	CL														
		35	100				0	CL														
25 NOVEMBER 1997	1:50	36	100	73 mm			36	100	0	CL	22.35 - 26.70 m Sandy SILT, reddish brown to brown, medium to low plasticity, firm to stiff, moist, containing some gravels with dia. up to 8 cm.											
		37	100				0	CL														
		38	100				0	CL														
		39	100				0	CL														
		40	100				0	CL														

Fig. 3.1.6 Surface Exploration Log No. A - 5 (1 of 2)

SUBSURFACE EXPLORATION LOG

PROJECT: SOIL MECHANICS SURVEY FOR THE DETAILED DESIGN OF FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
 LOCATION: QUARRY SITE
 AREA DESIGNATION: 438 254 meter
 GROUND ELEVATION: 438 254 meter
 COORDINATES: x = 437320.527 y = 9207834.635
 DEPTH OF G.W.L.

COMPLETION DATE: 21 November 1997
 COMMENCEMENT DATE: 21 November 1997
 ANGLE: 89° (VERTICAL)
 BEARING: Asap/Solandi
 DRILLER: Rudy Murni
 SUPERVISOR: Rudy Murni
 LOGGED: YEM - 3E
 DRILLING MACHINE: YEM - 3E

DATE	SCALE	DEPTH IN METERS	G.W.L. IN METERS	CORE BARREL & BIT TYPE	CASING TYPE	DEPTH OF WATER LOSS	CORES				METHOD OF SAMPLING	DESCRIPTION OF LITHOLOGY	ROCK STRUCTURE	WEATHERING	STRENGTH	JOINT SPACING	S.P.T. BLOW/30 cm	CUTTING	LOGGING	REMARKS		
							NO.	RECOVERY %	R.O.D. IN %	CLASSIFICATION												
24 NOVEMBER 1997	1:50	26	100	73 mm			26	100	0	CL	22.35 - 26.70 m Sandy SILT, reddish brown to brown, medium to low plasticity, firm to stiff, moist, containing some gravels with dia. up to 8 cm.											
		27	100				0	CL														
		28	100				0	CL														
		29	100				0	CL														
25 NOVEMBER 1997	1:50	30	100	73 mm			30	100	0	CL	26.70 - 30.00 m Silty CLAY, yellowish brown, high plasticity, very stiff to hard, moist.											
		31	100				0	CL														
		32	100				0	CL														
		33	100				0	CL														
		34	100				0	CL														
26 NOVEMBER 1997	1:50	35	100	73 mm			35	100	0	CL	BOTTOM OF HOLE											
		36	100				0	CL														
		37	100				0	CL														
		38	100				0	CL														
		39	100				0	CL														
		40	100				0	CL														
		41	100				0	CL														
		42	100				0	CL														
		43	100				0	CL														
		44	100				0	CL														
45	100	0	CL																			

Fig. 3.1.6 Surface Exploration Log No. A - 5 (2 of 2)

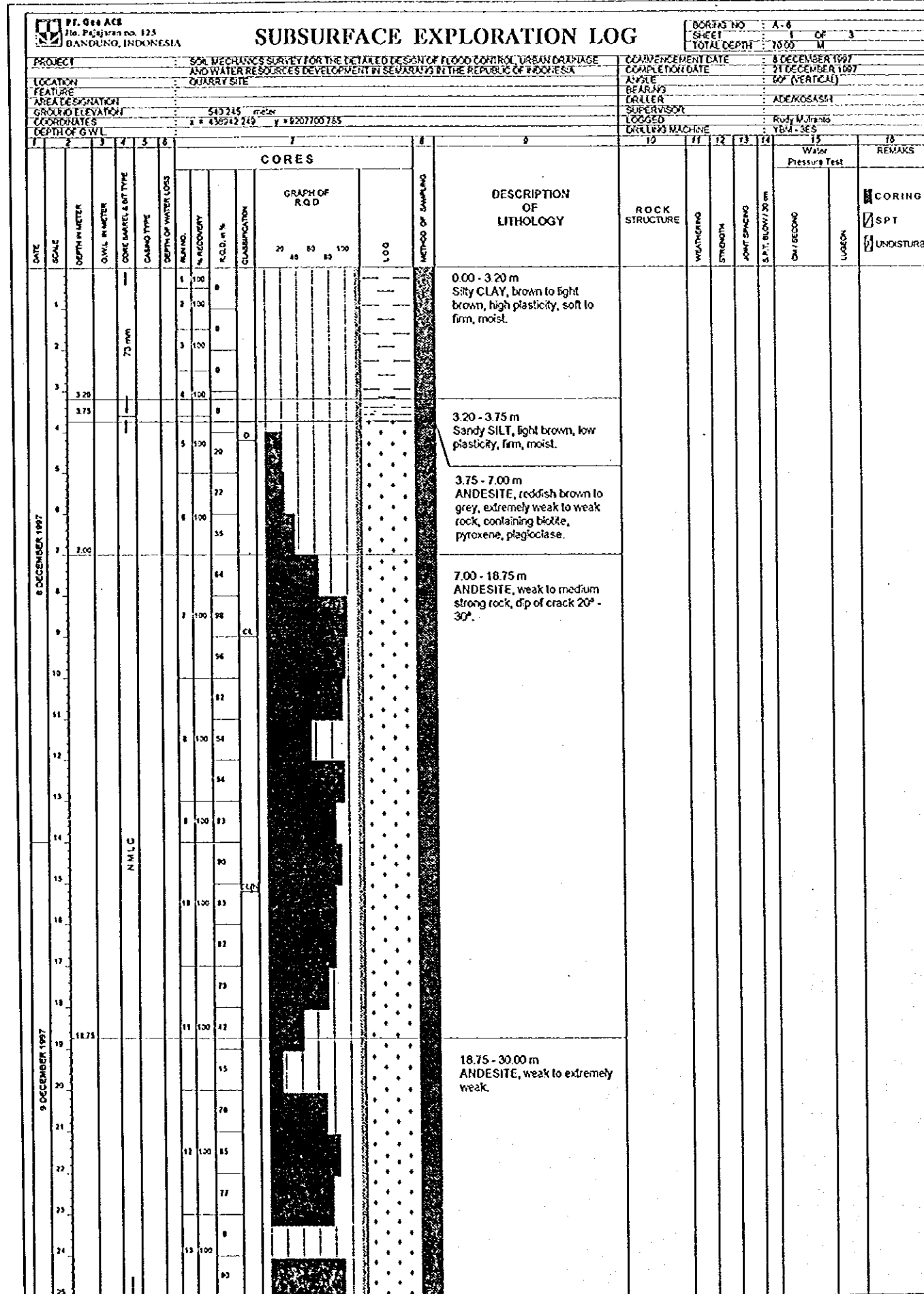


Fig. 3.1.7 Surface Exploration Log No. A - 6 (1 of 3)

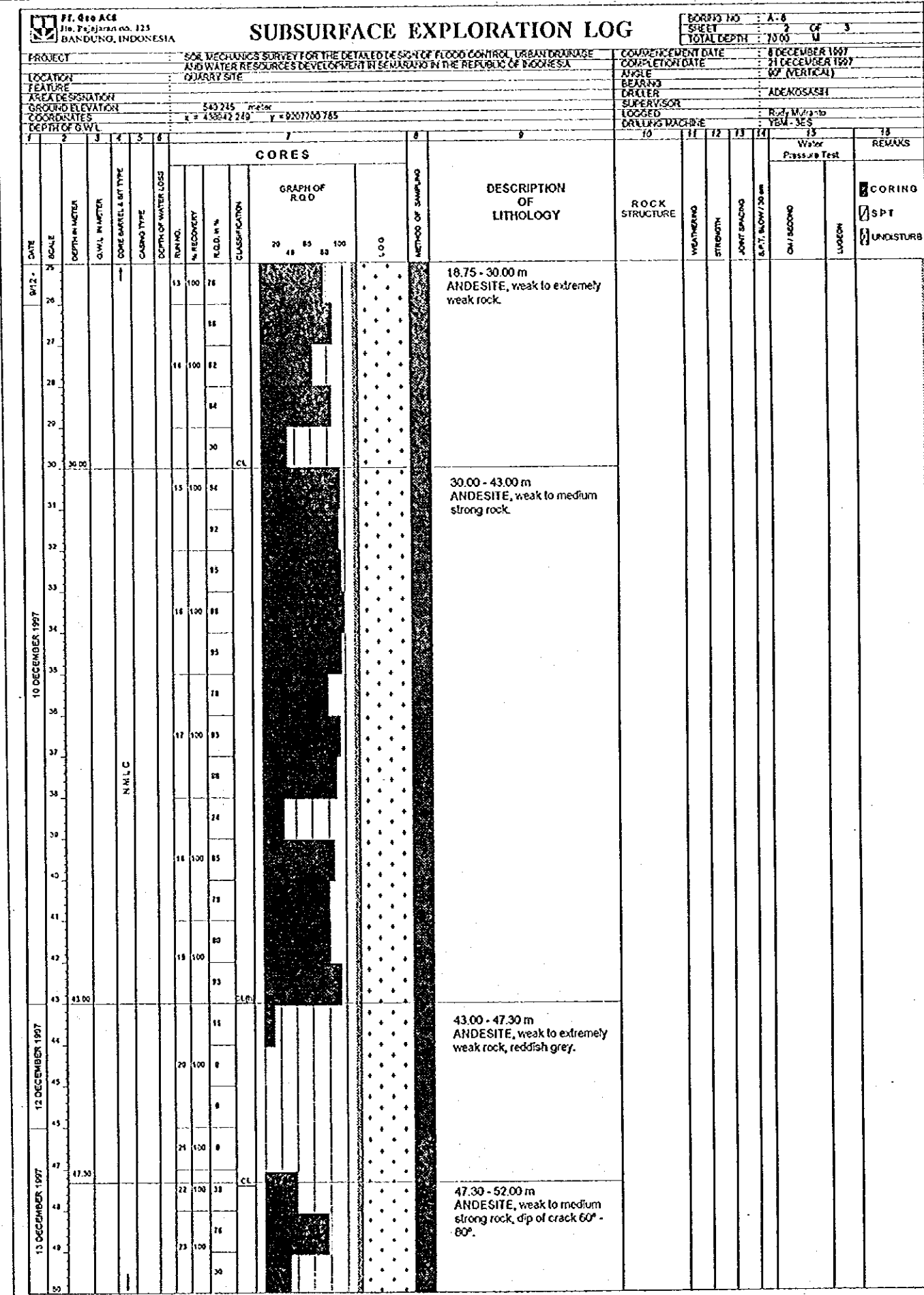


Fig. 3.1.7 Surface Exploration Log No. A - 6 (2 of 3)

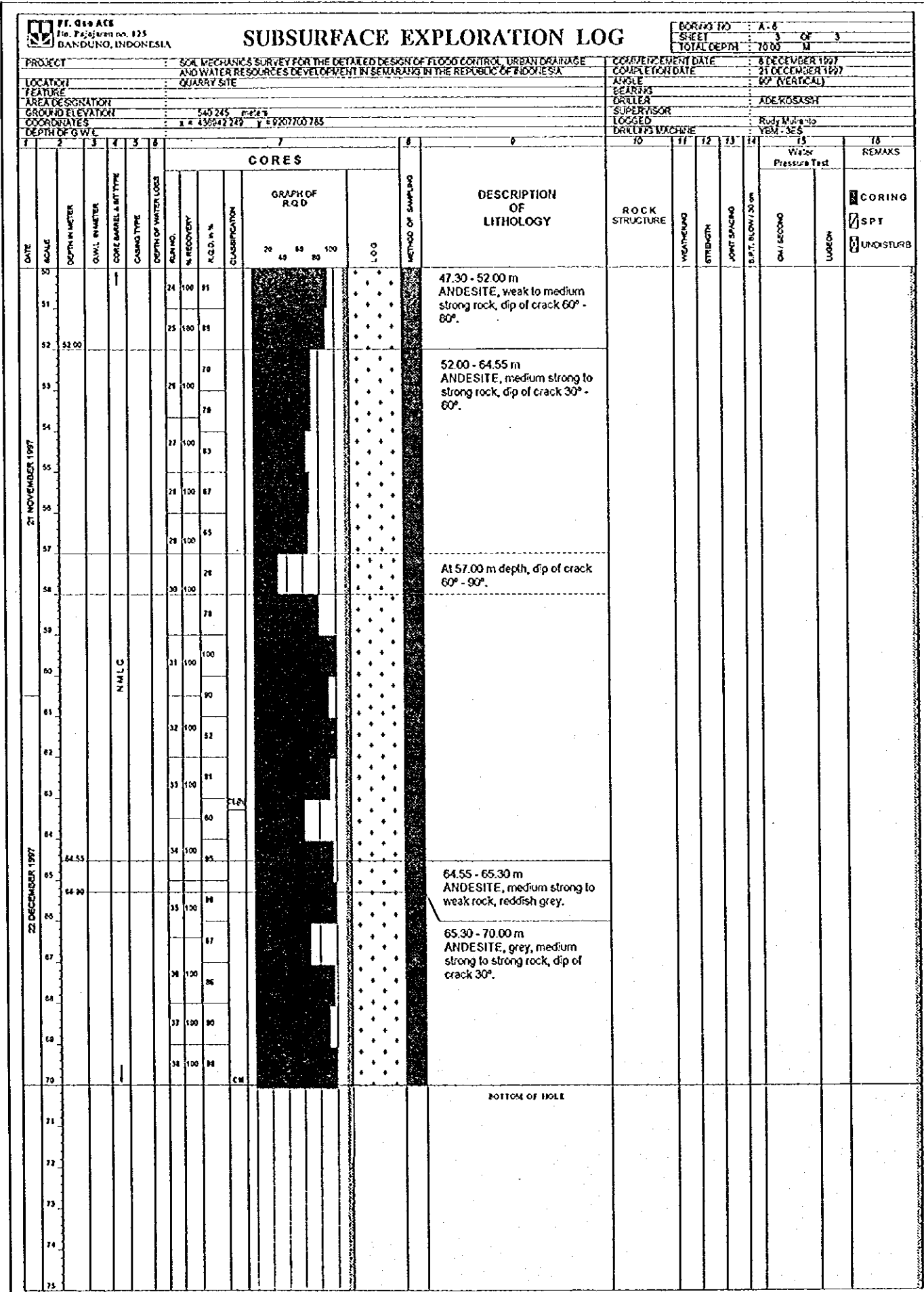


Fig. 3.1.7 Surface Exploration Log No. A - 6 (3 of 3)

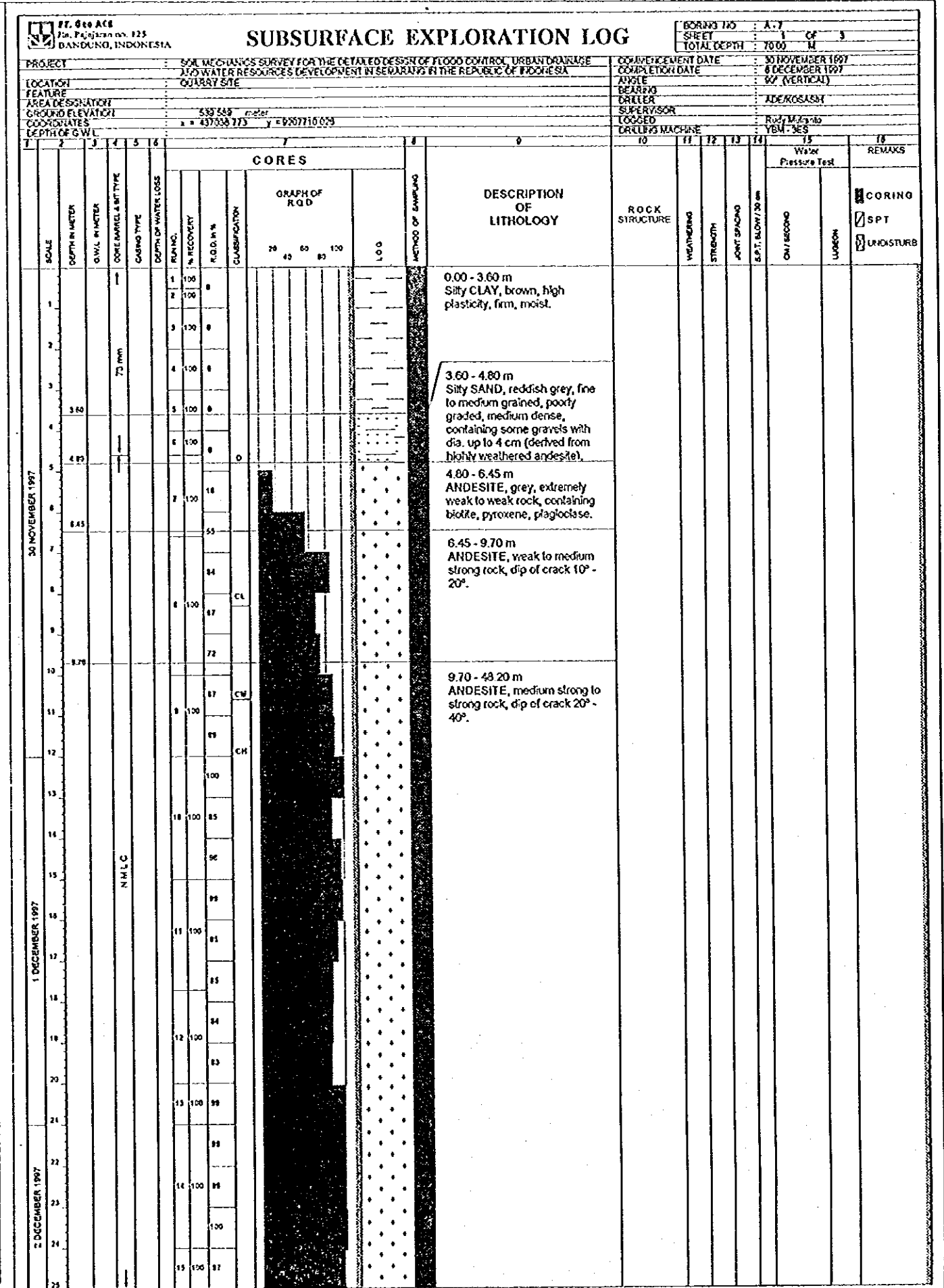


Fig. 3.1.8 Surface Exploration Log No. A - 7 (1 of 3)