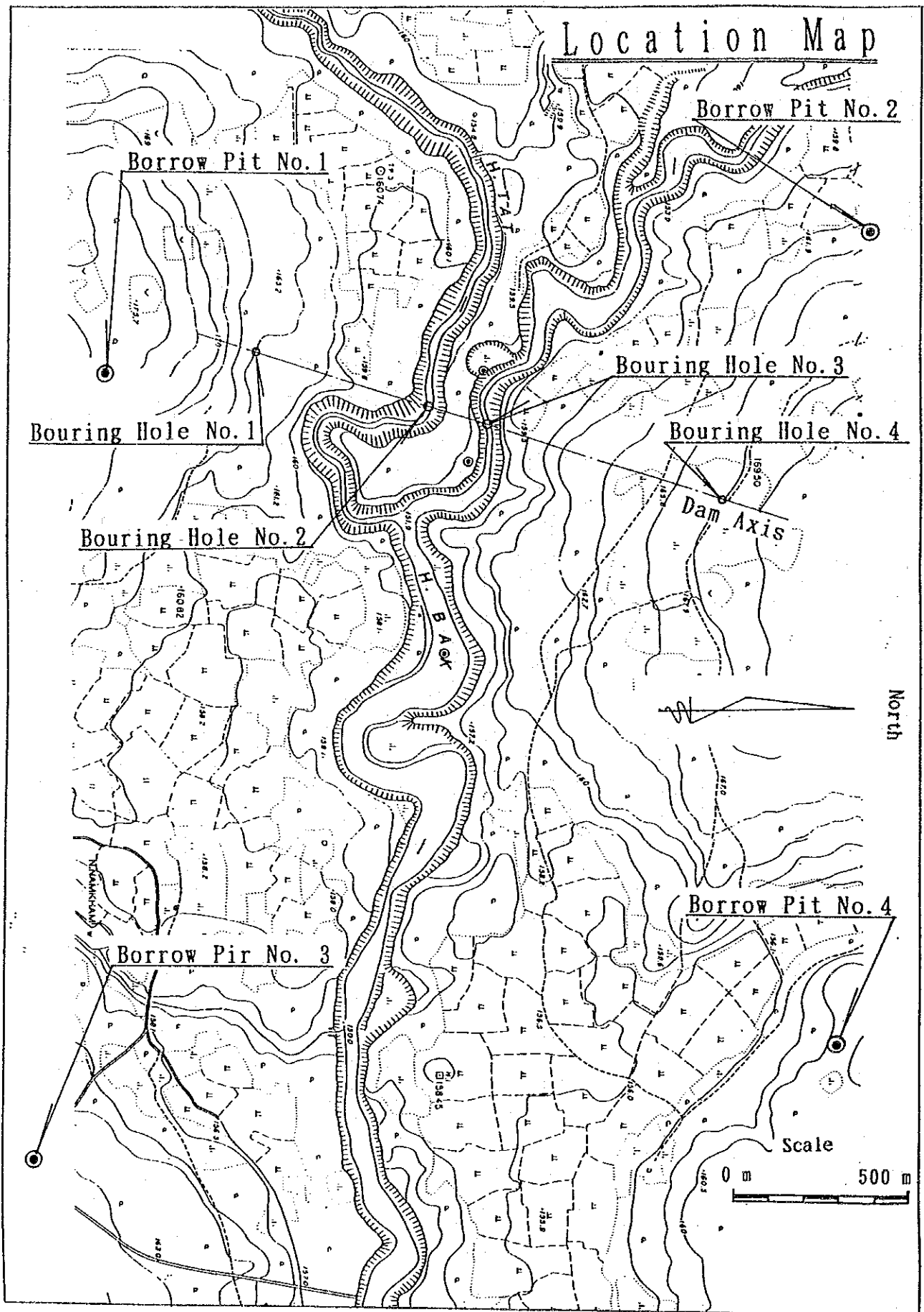


8 -1 LOCATION MAP OF BORING HOLES (HAY-BAK UP STREAM SITE)





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ENTERPRISE FOR SURVEY AND CONSTRUCTION  
MATERIAL LABORATORY

LAO PEOPLE'S DEMOCRATIC REPUBLIC  
PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY

SUB SOIL INVESTIGATION

BORING LOG

REPORTING SHEET

PROJECT : THE INTEGRATED AGRICULTURAL DEVELOPMENT IN SAVANNAKHET PROVINCE ASTM METHOD D 1586 FOR S.P.T  
BORING N° 1 . 85. meter far from point N° 0,00 PENETRATION TEST

DATE OCTOBER. 2. 1991....

NAME OF ENGINEER  
Mr. souvannarath

SCALE	ELEVATION	DEPTH	LAYER THICKNESS	OBSERVATION RECORD			N - VALUE					CONSISTENCY					
				SYMBOL	NAME OF SOIL	COLOR OF SOIL	DEPTH	QU	NUMBER OF	10 20 30 40 50 60 70 80							
m	m	m	m				m	kg/cm <sup>2</sup>	BLOW PER 30cm								
1	2	3	4	5	6	7	8	9	10	11					12		
		0.20	0.20		Sandy clay		0.90	0.96	9								Soft
1							2.10	1.60	15								Stiff
2							3.30	1.45	14								Stiff
3							4.20	2.24	21								Very stiff
4							5.10	2.78	26								Very stiff
5			10.90		Sandy clay loam + gravel	Yellowish brown	5.70	6.20	58								Hard
6							6.60	8.02	75								Very hard
7							7.80	3.63	34								Very stiff
8							8.70	2.78	26								Very stiff
9							9.60	3.95	37								Hard
10							10.50	5.77	54								Hard
		11.10					11.10	8.02	75								Very hard

REMARKS

N: BLOWS PER FT ( 140 LB HAMMER 30" DROP. 20 D. SAMPLER )

QU: UNCONFINED COMPRESSIVE STRENGTH ( kg / cm<sup>2</sup> )

VIENTIANE . DATE . NOVEMBER . 11, 1991 . . . . .

DIRECTOR  
  
SIVISAY NGEUN

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SUB SOIL INVESTIGATION

BORING LOG

REPORTING SHEET

PROJECT : THE INTEGRATED AGRICULTURAL DEVELOPMENT IN SAVANNAKHET PROVINCE A STM METHOD D 1586 FOR S.P.T  
 BORING N° 2 ( Houei Tat )

PENETRATION TEST

DATE September 29, 1991...

NAME OF ENGINEER

Mr. souvannarath .....

SCALE	ELEVATION	DEPTH	LAYER	OBSERVATION RECORD			DEPTH	QU	NUMBER OF	N - VALUE								CONSISTENCY		
				THICKNESS	SYMBOL	NAME OF SOIL				COLOR OF SOIL	m	kg/cm <sup>2</sup>	BLOW PER 30cm	10	20	30	40		50	60
m	m	m	m																	
1	2	3	4	5	6	7	8	9	10	11								12		
1		1.07	1.07		Sandy gravel+laterite	Strong brown	0.90	0.74	7											Soft
2		2.10	1.03		Sandy loam	Dark yellowish brown	2.10	-	3											Very soft
3		3.25	1.15		Loamy sand+gravel	Black	3.30	1.17	11											Stiff
4		4.50	1.25		Sandy gravel	Very dark grayish brown	4.50	1.49	14											Stiff
5					Loamy sand+gravel	Very dark grayish brown	5.10	1.39	13											Stiff
6			2.46		Loamy sand+gravel	Very dark grayish brown	6.00	-	1											Very soft
7		6.96 7.12			Slate	Dark grayish brown	7.12	8.02	75 <sup>+</sup> /6cm											Very dense
8			0.16																	
9																				
10																				

REMARKS

N: BLOWS PER FT ( 140 LB HAMMER 30" DROP 2" O. D. SAMPLER )

QU: UNCONFINED COMPRESSIVE STRENGTH ( kg / cm<sup>2</sup> )

VIENTIANE. DATE .. NOVEMBER 11, 1991 .....

DIRECTOR  
  
 SIVISAY NGEUN

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SUB SOIL INVESTIGATION      **BORING LOG**      REPORTING SHEET

PROJECT : THE INTEGRATED AGRICULTURAL DEVELOPMENT IN SAVANNAKHET PROVINCE A STM METHOD D 1586 FOR S.P.T  
 BORING No 3 ( Houei bak )      PENETRATION TEST

DATE October, 3, 1991  
 NAME OF ENGINEER  
 Mr. souyaonarath

SCALE	ELEVATION	DEPTH	LAYER THICKNESS	OBSERVATION RECORD			DEPTH	QU kg/cm <sup>2</sup>	NUMBER OF BLOW PER 30cm	N - VALUE								CONSISTENCY
				SYMBOL	NAME OF SOIL	COLOR OF SOIL				10	20	30	40	50	60	70	80	
										11								
m	m	m	m				m											
1	2	3	4	5	6	7	8	9	10	11								12
1		1.45	1.45		Loamy sand	Very pale brown	0.90	1.07	10									Soft
2		3.00	1.55		Sandy loam	Brownish yellow	2.10	5.88	55									Hard
3			2.10		Loamy sand	Gray	3.30	2.67	25									Very stiff
4		5.10	2.10		Loamy sand	Gray	4.80	7.49	70									Hard
5			3.10		Sandy loam	Dark gray	6.30	3.21	30									Very stiff
6		8.20	3.20		Shale	Black	7.80	1.28	12									Stiff
7							9.30	3.21	30									Very stiff
8							10.80	1.28	12									Stiff

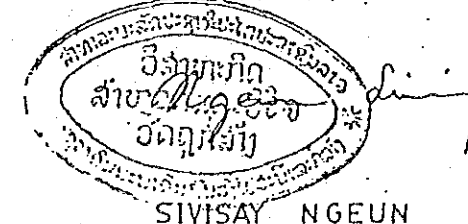
REMARKS

N: BLOWS PER FT ( 140 LB HAMMER 30" DROP 2.0 D. SAMPLER )

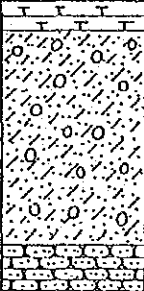
QU: UNCONFINED COMPRESSIVE STRENGTH ( kg / cm<sup>2</sup> )

VIENTIANE. DATE .. NOVEMBER, 11, 1991 .....

DIRECTOR .



SIVISAY NGEUN

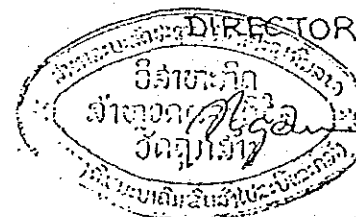
1	2	3	4	5	6	7	8	9	10	11	12
		11,40								10 20 30 40 50 60 70 80	
			2,93		Sandy loam+ gravel	Dark grayish brown	11,70	1,81	17		Stiff
		14,33					13,20	3,21	30		Very stiff
		15,00	0,67		Sand stone	Dark red	14,10	4,28	40		Hard
							14,70	8,02	75		

.REMARKS:

.N: BLOWS PER FT (140 lb HAMMER 30" DROP 2" O.D SAMPLER).

.QU: UNCONFINED COMPRESSIVE STRENGTH (kg/cm<sup>2</sup>).

VIENTIANE;



SIVISAY NGEUN

SUB SOIL INVESTIGATION

BORING LOG

REPORTING SHEET

PROJECT : THE INTEGRATED AGRICULTURAL DEVELOPMENT IN SAVANNAKHET PROVINCE A S T M METHOD D 1586 FOR S.P.T


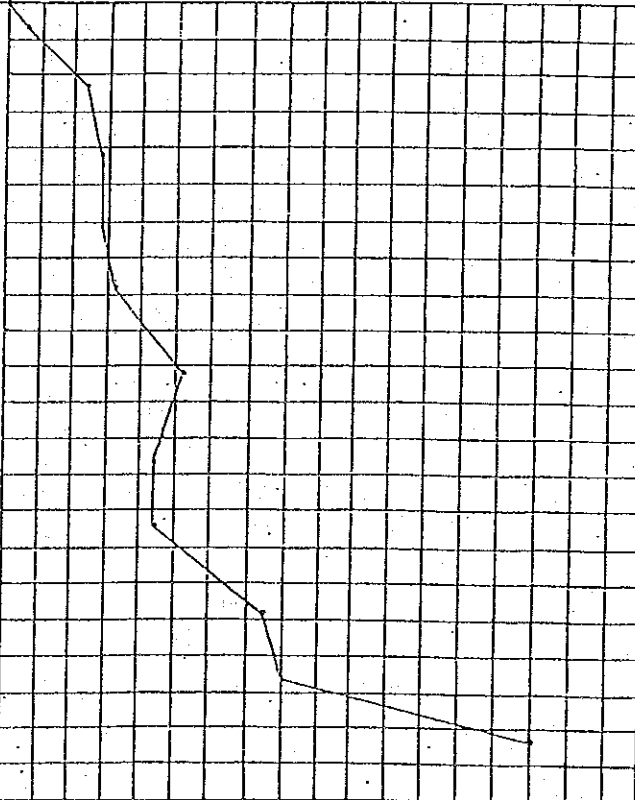
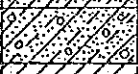


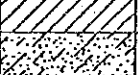
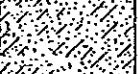
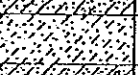

DATE October 8-10, 1991

BORING No 4, 240 meter far from poin 800

PENETRATION TEST

NAME OF ENGINEER

Mr Souvannaratb.....

SCALE	ELEVATION	DEPTH	LAYER THICKNESS	OBSERVATION RECORD			DEPTH	QU	NUMBER OF BLOW PER 30cm	N - VALUE								CONSISTENCY								
				SYMBOL	NAME OF SOIL	COLOR OF SOIL				10	20	30	40	50	60	70	80									
m	m	m	m				m	kg/cm <sup>2</sup>																		
1	2	3	4	5	6	7	8	9	10	11								12								
			1.10		Sandy clay loam	light reddish brown	0.30	-	3									Very soft								
1		1.10					1.20	1.28	12																	Stiff
2		1.85	0.75		Sandy clay loam + gravel	Reddish yello	2.10	1.49	14																	Stiff
3			2.62		Clay	Reddish yello	3.00	1.49	14																	Stiff
4		4.47					3.90	1.71	16																	Stiff
5			1.77		Sandy loam	Strong brown	5.10	2.78	26																	Very stiff
6		6.24					6.30	2.35	22																	Very stiff
7		6.93	0.69		Loamy sand	Pink	7.20	2.35	22																	Very stiff
8		7.85	0.92		Sandy clay loam + gravel	Light gray	8.40	3.95	37																	Hard
9		9.00	1.15		Sandy clay loam	Light gray	9.30	4.28	40																	Hard
10		10.20	1.20		Sandy clay loam + gravel	Yellow	10.20	8.02	75 <sup>+</sup>									Very hard								

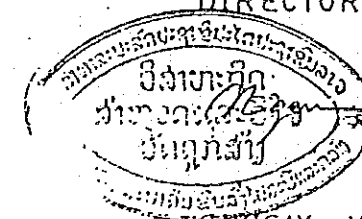
REMARKS

N: BLOWS PER FT (140 LB HAMMER, 30" DROP, 20 D. SAMPLER)

QU: UNCONFINED COMPRESSIVE STRENGTH (kg/cm<sup>2</sup>)

VIENTIANE, DATE NOVEMBER 11, 1991

DIRECTOR

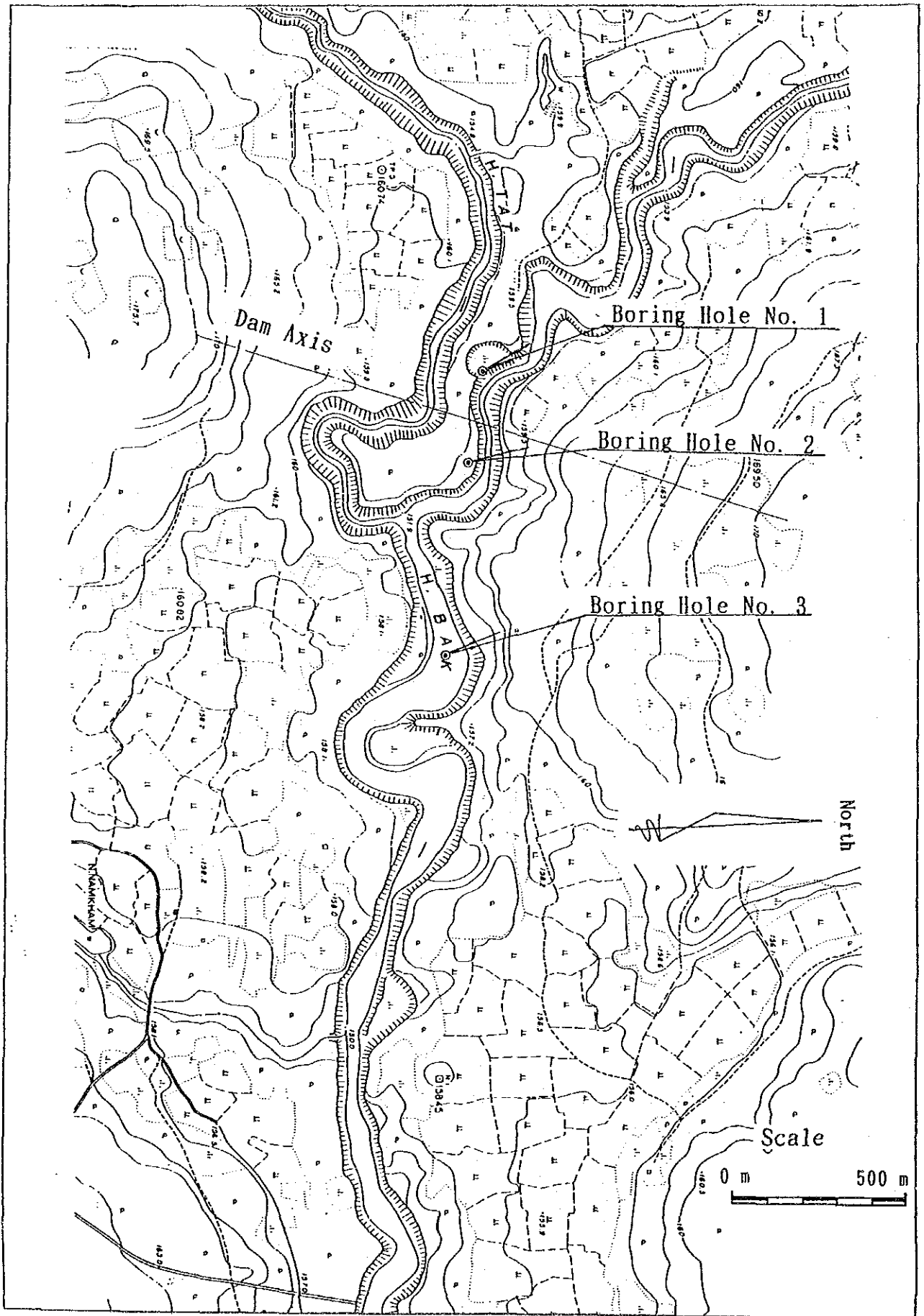


STIVISAY NGEUN





8 - 2 LOCATION MAP OF BORINGS HOLES (HAY-BAK UP STREAM SITE)



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BORING LOG

REPORTING SHEET

PROJECT : HOUAY BAK DAM

ASTM METHOD D 1586 FOR S.P.T

DATE 18.6.93

BORING NO 1

PENETRATION TEST

NAME OF ENGINEER

SISAVATH

SCALE	ELEVATION	DEPTH	LAYER THICKNESS	OBSERVATION RECORD			DEPTH	QU	NUMBER OF BLOW PER 30cm	N - VALUE							CONSISTENCY			
				SYMBOL	NAME OF SOIL	COLOR OF SOIL				10	20	30	40	50	60	70		80		
m	m	m	m				m	kg/cm <sup>2</sup>												
1	2	3	4	5	6	7	8	9	10	11							12			
1		1.20	1.20		LOAMY SAND	LIGHT YELLOWISH BROWN	0.15 - 0.45 0.75 - 1.05	- -	4 4									VERY SOFT VERY SOFT		
2					SANDY LOAM	DARK YELLOWISH BROWN	1.75 - 2.05	-	4									VERY SOFT		
3	Date 19.6.93 3.90						2.75 - 3.05	-	5											VERY SOFT
4			5.70				3.75 - 4.05	-	5											VERY SOFT
5							4.75 - 5.05	0.64	6											SOFT
6							5.75 - 6.05	0.64	6											SOFT
7		6.90					6.60 - 6.90	7.49 <sup>+</sup>	70 <sup>+</sup>								VERY HARD			
8		8.00	1.10		LIGNITE	BLACK	STOP DRILLING AT 8.00m BECAUSE IT IS VERY HARD													
9																				
10																				
11																				
12																				

REMARKS: N - BLOWS PER FT (140LB HAMMER 30" DROP, 2" O.D. SAMPLER )  
 QU - UNCONFINED COMPRESSIVE STRENGTH ( kg/cm<sup>2</sup> )

VIENTIANE DATE  
 DIRECTOR

MINISTRY OF COMMUNICATION TRANSPORT  
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 MATERIAL LABORATORY

LAO PEOPLE'S DEMOCRATIC REPUBLIC  
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BORING LOG

REPORTING SHEET

PROJECT : HOUAY BAK DAM

ASTM METHOD D 1586 FOR S.P.T

DATE 14.6.93

BORING NO 2

PENETRATION TEST

NAME OF ENGINEER  
 SISAVATH

SCALE	ELEVATION	DEPTH	LAYER	OBSERVATION RECORD			N - VALUE					CONSISTENCY							
				THICKNESS	SYMBOL	NAME OF SOIL	COLOR OF SOIL	DEPTH	QU	NUMBER OF									
m	m	m	m					kg/cm <sup>2</sup>	BLOW PER 30cm	10	20	30	40	50	60	70	80		
1	2	3	4	5	6	7	8	9	10	11					12				
1		1,20	1,20		LOAMY SAND	LIGHT REDDISH BROWN	0,15 - 0,45	-	2										VERY SOFT
2		2,20	1,00		LOAMY SAND+GRAVEL		0,75 - 1,05	-	4										VERY SOFT
3	3,80	3,60	1,40		LOAMY SAND	LIGHT YELLOWISH BROWN	1,75 - 2,05	2,99	28										VERY STIFF
4		4,60	1,00		SANDY LOAM+GRAVEL		2,75 - 3,05	2,46	23										VERY STIFF
5					SANDY CLAY LOAM + GRAVEL		3,75 - 4,05	2,03	19										STIFF
6			2,60		SANDY CLAY LOAM + GRAVEL		4,75 - 5,05	1,07	10										SOFT
7		7,20					5,75 - 6,05	1,39	13										STIFF
8						BROWNISH YELLOW	6,75 - 7,05	1,49	14										STIFF
9							7,75 - 8,05	3,53	33										VERY STIFF
10							8,05 - 9,05	3,74	35										VERY STIFF
11			12,80		SANDY LOAM+GRAVEL		9,75 - 10,05	7,74*	70*										VERY HARD
12																			

REMARKS: .N - BLOWS PER FT (140LB HAMMER 30" DROP, 2" O.D. SAMPLER )  
 .QU - UNCONFINED COMPRESSIVE STRENGTH ( kg/cm<sup>2</sup> )

VIENTIANE, DATE.....  
 DIRECTOR

1	2	3	4	5	6	7	8	9	10	11	12
14				10 9 8 7 6 5 4 3 2 1							
15				10 9 8 7 6 5 4 3 2 1							
16			12,80	10 9 8 7 6 5 4 3 2 1	SANDY LOAM + GRAVEL	BROWNISH YELLOW			DRILLING TO 20 METERS		
17				10 9 8 7 6 5 4 3 2 1							
18				10 9 8 7 6 5 4 3 2 1							
19				10 9 8 7 6 5 4 3 2 1							
20		20,00		10 9 8 7 6 5 4 3 2 1							
21				10 9 8 7 6 5 4 3 2 1							
22				10 9 8 7 6 5 4 3 2 1							
23				10 9 8 7 6 5 4 3 2 1							
24				10 9 8 7 6 5 4 3 2 1							
25				10 9 8 7 6 5 4 3 2 1							
26				10 9 8 7 6 5 4 3 2 1							
27				10 9 8 7 6 5 4 3 2 1							
28				10 9 8 7 6 5 4 3 2 1							
29				10 9 8 7 6 5 4 3 2 1							
30				10 9 8 7 6 5 4 3 2 1							

REMARKS: .N - BLOWS PER FT ( 140 LB HAMMER 30" DROP, 2" O.D. SAMPLER )

VIENTIANE, DATE .....

.QU- UNCONFINED COMPRESSIVE STRENGTH ( kg/cm<sup>2</sup> )

DIRECTOR

SIVISAY NGEUN

MINISTRY OF COMMUNICATION TRANSPORT  
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 MATERIAL LABORATORY

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## BORING LOG

REPORTING SHEET

PROJECT : HOUAY..BAK..DAM .....

ASTM METHOD D 1586 FOR S.P.T

DATE ..12..6..93.....

BORING N° 3 .....

PENETRATION TEST

NAME OF ENGINEER  
SISAVATH.....

SCALE	ELEVATION	DEPTH	LAYER	OBSERVATION RECORD			N - VALUE							CONSISTENCY										
				THICKNESS	SYMBOL	NAME OF SOIL	COLOR OF SOIL	DEPTH	QU	NUMBER OF														
m	m	m	m					kg/cm <sup>2</sup>	BLOW PER 30cm	10	20	30	40	50	60	70	80							
1	2	3	4	5	6	7	8	9	10	11							12							
1	date:13.6.93 1,40	3,00	3,00		LOAMY SAND+GRAVEL	LIGHT REDDISH BROWN	0,15-0,45	-	2										VERY SOFT					
												0,75-1,05	0,85	8										SOFT
2												1,75- 2,05	0,96	9										SOFT
3				3,20		SANDY CLAY LOAM	PINK	2,75-3,05	1,17		11										STIFF			
4												3,75- 4,05	-	2										VERY SOFT
5												4,75-5,05	-	5										VERY SOFT
6			6,20	10,80		SANDY CLAY LOAM +GRAVEL	LIGHT GRAY	5,75-6,05	0,64		6										SOFT			
7												6,75- 7,05	0,75	7										SOFT
8												7,75- 8,05	0,64	6										SOFT
9												8,75- 9,05	-	4										VERY SOFT
10												9,75-10,05	-	4										VERY SOFT
11												10,75-11,05	-	5										VERY SOFT
12						11,75-12,05	0,64	6										SOFT						

REMARKS: .N - BLOWS PER FT (140LB HAMMER 30"DROP, 2" O.D. SAMPLER )

.QU - UNCONFINED COMPRESSIVE STRENGTH ( kg/cm<sup>2</sup> )

VIENTIANE, DATE.....

DIRECTOR

1	2	3	4	5	6	7	8	9	10	11	12		
14			10,80		SANDY CLAY LOAM + GRAVEL	LIGHT GRAY	12,75 - 13,05	0,96	9		SOFT		
15									13,75 - 14,05		1,07	10	SOFT
16									14,75 - 15,05		1,60	15	STIFF
17		17,00							15,75 - 16,05		1,92	18	STIFF
18					SANDY LOAM + GRAVEL	DARK GRAY	16,75 - 17,05	2,78	26		VERY STIFF		
19									17,75 - 18,05		5,67	53	HARD
20									18,75 - 19,05		7,06	66	HARD
21			8,00						19,75 - 20,05		7,49 <sup>+</sup>	70 <sup>+</sup>	VERY HARD
22							↑ DRILLING TO	25 METERS					
23													
24													
25		25,00											
26													
27													
28													
29													
30													

REMARKS: .N - BLOWS PER FT (140 LB HAMMER 30" DROP, 2" O.D. SAMPLER)

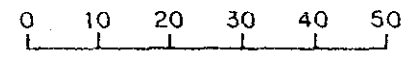
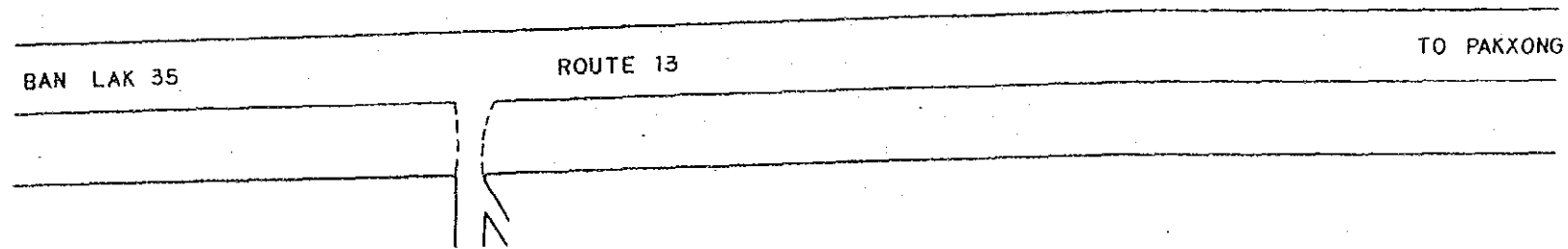
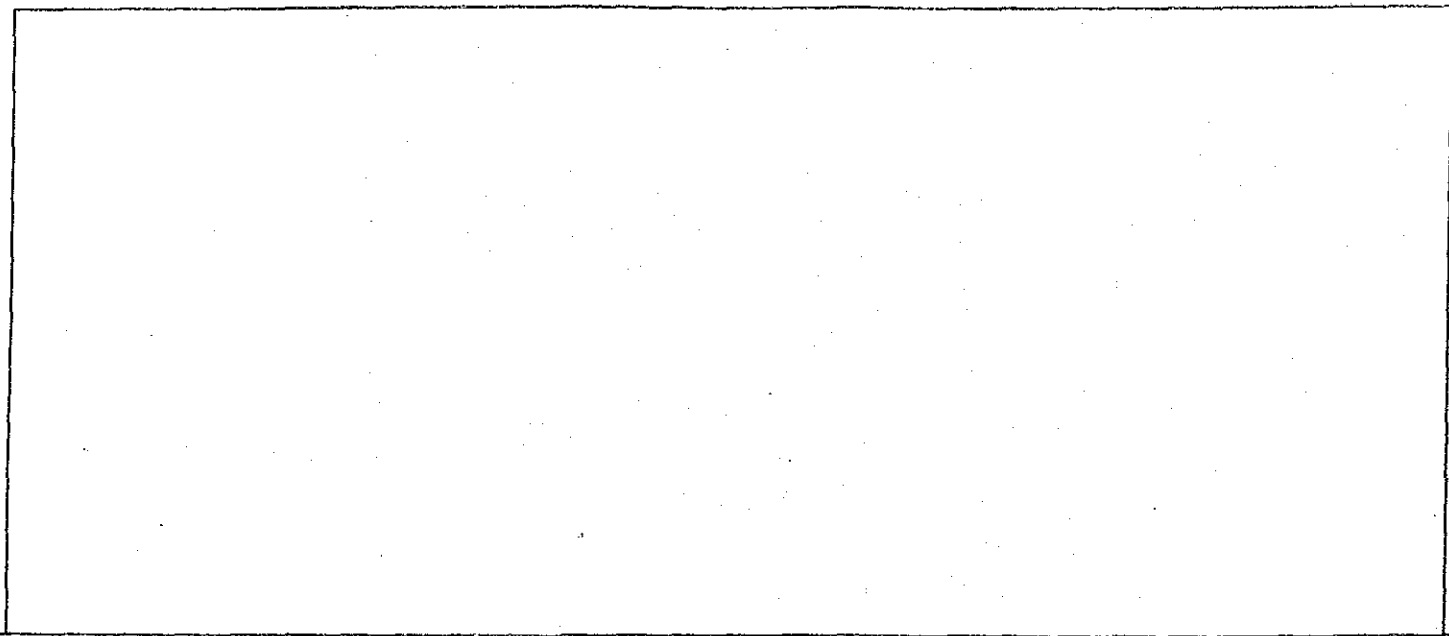
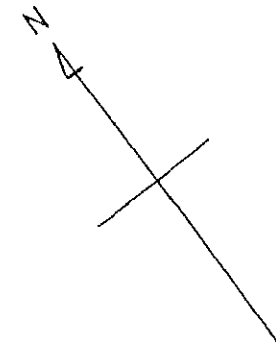
VIENTIANE, DATE .....

.QU- UNCONFINED COMPRESSIVE STRENGTH ( kg/cm<sup>2</sup> )

DIRECTOR

SIVISAY NGEUN

9 AGRICULTURE SUPPORTING CENTER AREA MAP







## 10 Estimation of Local Portion for Lao Government

### Breakdown of Local Cost

Item	Unit	Qty	Price/Unit	Cost(Kips)
Re-Location Fee	ha	70.0	24,050	1,684,000
Land Acquisition for Dam site (forestry)	ha	1,180.0	24,050	28,379,000
Land Acquisition for Dam site (paddy field)	ha	200.0	120,250	24,050,000
Land Acquisition for H. Bak Canal	ha	33.8	120,250	4,064,000
Land Acquisition for Nampu Canal	ha	9.5	120,250	1,142,000
Land Acquisition Agricultural Supporting Center	ha	1.69	120,250	203,000
Construction Cost for Fencing and Gate	set	1		33,063,000
Woods cutting and Transporting to Market	set	1		190,164,000
<b>Total</b>				<b>282,749,000</b>

### Estimation of Dam site Wood Cutting

Woods selling to Market	480,000,000
Woods cutting and Transporting to Market	190,000,000
<b>Balances ( Profit )</b>	<b>289,000,000</b>





JICA