

Figure J.3

Detailed Geological Logs of Core Drillings

- BD1(L=50m)at Dinh Binh Damsite (1/2-2/2)
- BW1(L=30m)at Van Phon Weir Site
- BC1 to BC2 (L=20m for each hole)along Van Phon Main Canal (1/2-2/2)
- BR1 to BR8 (L=10m for each hole)at River Improvement Area (1/8-8/8)

Bore	hole l	N^0		BD1	Locat	ion:	Dinh Binh	Dam site							1/2	2 She	ets	
X:		1,56	6,718			Y:	19,259,367					El	evation		108,87m			
Drilli	ng date:			29/12/2002		Drilling m	nachine:	XY -	1A			Ve	etical scale	e	1/100			
Inclin	nation:		90 ⁰	Dep	pth:	50.0 m		Total core reco	overy:	27.25		W	ater level		16.2 m			
Depth (m)	Elevation	(m)	Lithology		Geolo	gical discrip	otion		Degree of weathering	Core recovery length (m)	R.Q.D (%) 20 40 60 8	80	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	10 20	SPT 30 4	40 50
1.8		.07		 0.0 - 4.9m Layer 3, 0 0.0 - 1.8 m: wet, firm (clay/silty), 30% san 30 cm in size, consist 1.8 - 4.9m: Sility/C brownish yellow, ab size of gravel is betw 	Gravelly CLA n to stiff, brow d and 30% gr ts of quartz an Clayey GRAV out 30% fine een 5cm and 3	Y to Silty (vnish gray to avel. Gravel d subangular /EL, wet, f (clay/silt), 30 cm.	GRAVEL p yellowish gray l, generally rang r granite block. firm to stiff, y 30% sand and	y, about 40% fine ging from 5 cm to ellowish gray to 40% gravel. The							3.0m _E .01 x 98°E.			• »
4.9 5 8.3		- _ .57		4.9 - 8.3m Complete Brownish gray to gre to rock block. The r hand. Feldspar is alm	ely weathered eenish gray, mo ock blocks ma nost weathered	granitie ostly decom ay be broked into clay m	posed to sandy dn into pieces o inerals.	soil and partially or finer gravel by	CW	. 10.0					$k = 4.59 \times 10^4$ $m_{0.9}$ $k =$			
10	Industria	+ + +	+ + + + + + + + + + + + + + + + + + +	8.3 - 10.1 m Strongl Brownish gray to 1 and joints are gene	y (highly) wea light gray, me rally open wi	athered gra ostly weath th a crack y	nite nered into rock width of 2 to 5	c blocks. Cracks mm. The rock,	HW									
10.1				moderately weak t scartched by knife. 10.1 - 16.4m Moder: Greenish gray to ligl few cracks and joints The surface of crack hammar. Core lenght	ately weather ht gray, massi , partially ope is are generall is generally :	ed granite ve structure, n are develo y oxidized. 5cm to 10 cr	, moderately str pped with a crac The rock can b n.	rong to strong. A k width of 1 mm. be broken with a	MW	1.6 0.75 1.60					11.4m			
15		47	+ + + + + + + + + + + + + + + + + + +							0.85					16.0m			
18.7	90.	.17	+ + + + + + + + + + + + + + + + + + +	16.4 - 18.7 m Compl Greenish gray to lig partially to clayey so into finer grain by ha	letely weather ht gray, wet, il. Granite gra nd.	r ed granite soft, almost wels, mostly	t decomposed to 2 to 5 cm in siz	o sandy soil and ze, can be broken	CW	3.0								
20			++++ ++++ +++++	18.7 - 27.6 m Moder Greenish gray to lig	ately weather	red granite ed with pinl	k, massive struc	cture, moderately		0.8			BD1/1 20 - 21.28		19.0m			
		-	+ + + + + + + + + + + + + + + + + + +	strong to strong. Slig partially open. The broken with a ham partially weathered i cm.	gntly cracked a surface of cra mar and soun into clay mine	and these cr acks are part ds dull. In erals. Core l	racks are 0.5 to tially oxidized. these crack su lenght is genera	2 mm wide, and The rock can be irface feldspar is illy 10 cm to 20	MW	0.85]						
25	<u>duuluuluuluulu</u>	-	+						171 77	0.95					24.0m			
27.6	81	27	+ +	76 215 - 94	4. (k:-1) \	ath1	anita			0.9								
30	<u>uluuluuluulu</u>		+ + + + + + + + + + + + + + + + + + +	Greenish gray to ligh strong. Cracks and jo spacing of 4 mm. Fo (core) can be easily b	t gray spotted bints are well eldspar is alm proken into sm	with brown, developed an ost weather aller gravels	ante , moderately we nd most of then ed into clay m s with a hammar	eak to moderately n are open with a inerals. The rock	HW	0.9				28.5 - 29 loss of drilling				

F	Bore ho	le N ⁰	BD1	Locati	on:	Dinh Bin	th Dam site							2/2	SHe	ets	
X:	1,5	66,718			Y:	19,259,36	7				El	evation		108,87m			
Drilling	date:		29/12/2002		Drilling m	achine:	XY -	1A			Ve	etical scal	e	1/100			
Inclinna	tion:	90 [°]	Dep	oth:	50.0 m		Total core reco	overy:	17.15		W	ater level		16.2 m			
th (m)	(ation	Lithology		Geolo	ogical discrip	tion		Degree	Core	R.Q.D		N ⁰ & depth of	Depth of water loss	Water		SPT	
Dept	Elev	Ennotogy		Guin	ogical alsonip	uon		weathering	length (m)	20 40 60	80	samples	or spring	test	10 2	20 30	40
30		+ + + + + + + + +						1111/	0.85				water				
		+ + + + + + + +						HW			ļ						
31.5	77.37	+ + + +	21.5 41.0 611	. 41					0.8		ļ						
		+++++++++++++++++++++++++++++++++++++++	Greenish gray to lig	ntiy weatne ght gray spot	ted with pin	k, massives	tructure, strong to		0.85		ļ						
		+ + + + + + + + +	very strong. Slightl weathered. The roc	y cracked an k (core) is v	nd most of the very dificulit	to be broke	se. Feldspar is less en with a hammar.		0.8								
		+ + + + + +		· /	5				0.9		l						
35		+ + + +										BD1/2		35.3m			
		_++++						SW				35.2-35.4					
		+ + + + + + + + + + + + + + + + + + + +							1.7								
37.0	71.87	₫+₫ ⁺									l						
		+ + + + +							0.95								
		+ +++++++++++++++++++++++++++++++++++++							0.9								
40		+ + + + + + + + + + + + + + + + + + + +							0.85					40.0-			
40		其 , ‡							0.9					40.0m			
41.0	67.87	+ + +										PD1/2					
		+ + + +	Unweathered granit	e to locally s	lightly weath	ered granite	e		0.95			41.7-42.0					
		+ + + + + + + + + + + + + + + + + + +	Fresh, medium-grain 10% biotite, 5% mica	ed biotite gra a and a trace	nite, about 6: of other min	5% feldspar, erals. greenis	20% quartz, 5% to h gray to light gray,		0.6		ļ						
		+ + + + + + + + + + + + + + + + + + +	slightly hair cracks. F	eldspar and b	piotite are less	s weathered.			1.1								
		+ + +															
45		+ + + + + + + + +							0.75		ļ						
		+ + + +						UW	0.9								
		+ + + + + + + +															
_		+ + + + + + + + + + + + + + + + + + + +							0.85								
		+ + + + + + + + + + + + + + + + + + + +							0.8								
		+ + + + + + + + + + + + + + + + + + +							1.7		ļ						
		+ + + + + + + + + + + + + + + + + + +															
50.0	58.87							1			<u> -</u>					H	+
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	Bore h	ole N ⁰	BW1	Locati	on:	Van Phon	g Weir site							1/	1 She	et	
X:		1,542,350			Y:	19,270,106					Elevati	ion		24,61m			
Drillin	g date:		31/12/2002		Drilling n	nachine:	XY -	1A			Vetical	l scale		1/100			
Inclin	nation:	90 ⁰	Dep	oth:	30.0 m		Total core reco	overy:	26.92		Water	level		3.30 m			
Depth (m)	Elevation	E Lithology		Geolog	gical discri	iption		Degree of weathering	Core recovery length (m)	R.Q.D (%) 20 40 60	N ⁴ dep 30 san	⁰ & with of with nples	Depth of water loss or spring	Water pressure test	10 20	SPT 0 30	40
2.6 5.0 5.3 8.3			 0.0 - 5.3 m Claye 0.0 - 2.6m: Claye gray, about 25 t gravel. The grave and quartz. 2.6 - 5.3m: Grav dense to vey den 50% sand and 2 sandstone. 5.3 - 11.1 m Clay Slightly wet, den gravel, 10% clay 50mm and 100mm	ey SAND to G cy SAND (SC) o 30% fine (c l varies in size relly CLAY ((se, black gray) 5% gravel. Th rey GRAVEL se to very der and 10% sand n in size and o	ravelly SA , dry, medii :lay/silt), 3: from 2mm CG) to Gra to brownish e gravel is (COBBLE use, brownist 1. The sand ceasionally	ND um dense, blacl 5 to 50% sanc to 10mm and c avelly SAND () gray, about 22 composed ma	k brown to brown d and 20 to 30% consisits of granite SG), slightly wet, 5% fine (clay/silt), inly of weathered t gray, about 80% is mostly between		8.6		BW 1.1 BW 2.3	W1/1 - 1.3 W1/2 - 2.5	-	k = 1.50 x 10 ⁻⁴ k = 1.30 x 10 ⁻⁴ k	••		
11.1 - 12.6 -			11.1 - 12.6 m Co Brown to brown block is hard and 12.6 - 14.7 m Mo Black gray to yel	mpletely to hi gray, mostly v is difficult to b derately to SI lowish gray, sl	ghly weath weathered in be peeled by ightly weath ightly crack	tered granite nto sandy/gravo y knife. thered diabase ked, its crack su	elly soil. The rock	CW-HW MW-SW	0.7 0.36 0.38 0.8					12.5m			
14.7 15.0 - -	9.9	$1 \qquad \qquad$	14.7 - 30.0m Mo Light gray, slight length of 10 cm t About 60% felda amount of others.	derately to Sli ly cracked, pai o 20 cm. the cr upsr, 25% qua	ghtly weat tially close ack surface rtz, 5 to 10	hered granite e, cores break a is partially oxi 0% biotite, 5%	long the cracks in dized.		0.70		ви	W1/3		17.0m			
20.0 _ -	antan kadan hadaa hada							MW-SW	1.7		18.4 BV 20.3 BV 21.6	 W1/4 W1/4 W1/5 W1/5 22.4 	•	19.0m			
25.0 _ - -	dudududududududududududud	+ + + + + + + + + + + + + + + + + + +							3.6				-	24.0m 25.0m			

	Bo	e hole	N^0	BC1	Location	n: Van Pho	ng canal							1/1 Sh	eet			
X:		1,5	43,739			Y: 19,280,08	8				El	evation (r	n)	25.23				
Dril	ling date	:		2003/4/1			XY - 1/	4			V	etical scal	e	1/100				
Incl	innation		90 ⁰		Depth:	20.0 m	Total core recovery	<i>y</i> :	20		W	ater level		1.10 m			_	
	(m) r	ration 1)			Ca	alogical description		Degree	Core	R.Q.D		N ⁰ &	Depth of	Water		SPT	Г	
	Deptl	Elev (n	Lithology		00	ological description		of weathering	recovery length (m)	(%) 20 40 60	80	depth of samples	or spring	test	10	20 3	0 4(0
			/?#亰/	0.0 - 1.9m	n Silty SAND with	some gravel (SM)					1	1	10				Π	
1.0		24.23	$\int 2$	0.0 - 1.0n silty, 50%	n: dry, mesium den sand and 20 fine to	o coarse angular gravel.	ray, about 20 clay, 10%	aQ	1.9			BC1/1 1.2 - 1.4						
1.9		23.33	1.1.1	1.0 - 1.9n	n: wet, loose to m	esium dense, brown gray	y to light gray, about 20								•			
			4A ⁺ + A ₊	Clay, 20%	sinty, 55% sand an	ia a nuie nne gravei.	/											
			+ 4 +	1.9 - 20.0	m Completely to H	Highly Weathered Gran	ite										• • •	
	_		4 ⁰ + 100+ +/ \ +	Greenish weathered	brown, brownish I rock and locally h	gray to light gray, s nighly weathered rock. Th	oft, mostly completely ne completely weathered											
5.0		20.23	+ 444 +	rock is all rock is we	most weathered in eathered partially in	to loose sandy soil, whi to loose sandy soil.	le the highly weathered											
	-		+++++++++++++++++++++++++++++++++++++++		1 5	5												
			4A ⁺ + AA+															
	_		+ + + + + + + + + + + + + + + + + + + +															
			₩ ⁺ + ₩+															
	=		+ 4+ +															
			₩ ⁺ + ₩+															
10.0		15.23	+ 4 + +															
			4A' + 4A+ + _ +					HW - CW	18.1									
			+ /A +															
			+ +															
			+ // +															
			+ + +															
			4A ⁺ + A+															
15.0		10.23	+ + + + +															•
			\$A ⁺ + \$A ₊															
			+ 4+ +															
			₩ ⁺ + ₩+															
	_		4A ⁺ + AA+															
			+ 4A +															•
			4 + / + / +															•
20.0		5.23	+ 1/94 +								+						\vdash	-
	_																	
25.0	'- <u>=</u>																	
30.0																		

Bo	re hole	N ⁰	BC2	Locatio	on: V	'an Phong	canal							1/1 She	eet		
X:	1,5	43,739			Y: 19	9,280,088					Е	levation (1	n)	25.23			
Drilling date	e:		2003/7/1		Drilling mach	nine:	XY - 1.	4			V	etical scal	e	1/100			
Inclinnation	:	90 ⁰		Depth:	20.0 m		Total core recovery	y:	18.65		V	Vater level		1.10 m		_	
Depth (m)	Elevation (m)	Lithology		Ger	ological descri	ption		Degree of weathering	Core recovery length (m)	R.Q. (%) 20 40 60	D) 80	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	10 2	SPT 20 30	40
	23.73 23.33		0.0 - 4.8m 0.0 - 1.2m 25% clay, 1.2 - 4.8m 20% silt, 5	Silty/Clayey SAN : brownish gray, bi 15% silt, 55% san : yellown brown tu 0% sand and 10%	ND with a little lack gray to ligh d and 5% fine gr o light gray, wet fine gravel (4 to	gravel nt gray, wet, ravel (4 to 6 t, medium de o 7 mm in si:	medium dense, about mm in size). ense, about 20% clay, ze).	aQ	8.0			BC2/1 1.3 - 1.5 BC2/2 3.8-4.0			• • •		
5.0 7.8	17.43	+ + + + + + + + + + + + + + + + + + +	4.8 - 9.7 m Light brow locally into	I Completely to H In to gray, slightly prock blocks. The	lighly Weatherd y wet, soft, mos rock blocks can	ed Granite tly weathere h be easily de	d into sandy soil and eformed by finger.	CW-HW	0.85			BC2/3 4.5-4.7	-				
10.0	15.23	+ //A + + + +							0.85								
		+ + +	9.7 - 16.8n Brownish	n Clayey/Silty GF gray to light gra	RAVEL y, soft, almost	weathered i	into rock blocks and	HW	0.85								
12.0	13.23	+ $+$ $+$ $+$ $+$ $+$	partially in	to sandy soil.					0.85								
		+ + +	12.0 - 20	0m Completely	weathered gr	anite			0.85								
		+ + + + +	Light gray	to greenish brov o rock blocks. The	wn, soft, mostly rock blocks can	y weathered be easily de	into sandy soil and eformed by finger.		0.85								
	10.22	+ + + 42+ + + + + +	,			,	, ,		0.85								
	10.25	+ 4 + + +						CW	0.85								
16.8	8 4 3	4 + + + + + + + + + + + + + + + + + + +							0.85								
20	5.23	+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$							3.0								

	Bore ho BR	le N ⁰ 1	Location: <i>Nhon</i>	My Commune, An Nhon Dis	strict, Binh Dinh	Province				1/	1 shee	t
X:	1,5	539,754		Y: 19,287,37	6			Elevation	(m)	14.39		
Drilli	ng date:		2003/12/1	Drilling machine:	XY	- 1A		Vetical sc	ale	1/100		
Inclir	nation:	90 0	Depth:	10.0 m	Total core rec	covery:		Water lev	el	3.50 m		
Depth (m)	Elevation (m)	Lithology	G	eological description		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	S 10 20	PT 30 40
2.0 _	12.39		 0 - 2.0m: Silty SAND with dense, brownish red to brown 15% silt, 10% clay, less than 2.0 - 5.0m: Silty SAND (greenish gray, about 90%) 	SM), wet, medium dense, b	htly wet, medium lium-grained sand, prownish gray to /silt).							
5.0 - -	9.39		5.0 - 6.5m: Silty SAND (SM dense, brownish gray to yel fine gravel.	1) with a little fine gravel, wet lowish brown, about 90% sand	medium dense to l, 5% silt and 5%							
- 10.0			6.5 - 10.0m: Sandy CLA about 35% clay, 30% silt a	AY (CS), slightly wet, firm and 35% fine sand.	, greenish gray,			BR1/1 7.0 - 7.2 BR1/2 8.4-8.6				

В	ore hol BR2	le N ⁰ 2	Location:	Nhon Phu	ac Commune, An Nhon D)istrict, Binh Dir	nh Province				1/	1 sheet	
X:	1,5	39,240			Y: 19,287,030)			Elevation	(m)	12.90		
Drilling	, date:		2003/11/1		Drilling machine:	XY	- 1A		Vetical sc	ale	1/100		
Inclinna	ation:	90 0		Depth:	10.0 m	Total core rec	covery:	0	Water lev	el	2.60 m		
Depth (m)	Elevation (m)	Lithology		Geolo	ogical description		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	SI 10 20	РТ 30 40
3.0 10.0	9.9 7.90 2.90		0 - 3.0m: Sandy greenish gray, ab 3.0 - 10.0m: Gr brown to browni rounded gravel w	y CLAY (CS), oout 35% clay, 30 avelly SAND (S ish gray, about 9 vith a little fine (SP), wet, medium dense to 0% silt and 35% sand.	dense, yellowish nd more than 5%			BR2/1 2.0 - 2.2				

	Bore h BF	ole N ⁰ R3	Location:	Nhon Kho	anh Commi	une, An Nhon D	istrict, Binh D	inh Provinc	e			1/	1 sh	eet	
X:	1	,538,112			Y:	19,288,173				Elevation	(m)	13.14			
Drilli	ng date:		13/1/2003		Drilling	machine:	XY	- 1A		Vetical sc	ale	1/100			
Inclin	nation:	90 0		Depth:	10.0 m		Total core rec	covery:		Water lev	el	2.30 m			
Depth (m)	Elevation	Lithology		Geol	ogical descr	ription		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	10	SP7	Г 0 40
0.6	12.54		0 - 3.5m: Silty S fines (silt/clay.	SAND (SM), we	t, loose, brov	wnish gray, about	80% sand, 20%						•		
3.5 - 5.3	9.64		3.5 - 5.3m: San 35% clay, 35% s	dy CLAY (CS), silt and 30% sand	wet, soft, b	lack gray to greer	iish gray, about								
7.7	5.44		5.3 - 7.7m: Silty gray to greenish 7.7 - 10.0m: San greenish gray, al	Y SAND (SM) wi gray, about 90% ndy CLAY (CS), bout 35% clay, 3	th a little find o sand, 5% fin wet, firm, hi 0% silt and	e gravel, wet, loos ne and a little amo igh plasticity. Brov 35% sand.	e, brownish ut of gravel. vnish gray to								

В	ore hol BR4	le N ⁰	Location: Nhon Hoa	Commune, An Nhon Dist	trict, Binh Dini	h Province				1/	1 sheet	
X:	1,5	35,120		Y: 19,296,080				Elevation	(m)	6.65		
Drilling	g date:		15/1/2003	Drilling machine:	XY	- 1A		Vetical sc	ale	1/100		
Inclinn	ation:	90 0	Depth:	10.0 m	Total core rec	covery:		Water lev	el	1.0 m		
Depth (m)	Elevation (m)	Lithology	Geolog	gical description		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	SF 10 20 3	т 30 40
	6.05 5.35 1.65		0 - 1.3m: Silty CLAY (CM), wet, brown, 60 to 80% sand, 10 to 20% 1.3 - 10.0m: Sility SAND (SM wet, medium dense to dense, ye sand, 5% fine (clay/silt) and a l	medium dense, brownish g silt and 5 to 20% clay. 1) with occasional well-ro ellowish brown to lisgt gr ittle amount of gravel.	ray to yellowish ounded gravel, ray, about 90%			BR4/1 0.4 - 0.6				

В	ore hol BR5	le N ⁰ 5	Location:	Phuoc H	liep Comm	une, Tuy Phuoc	District, Binh L	Dinh Provin	ce			1/	1 shee	et	
X:	1,5	35,377			Y:	19,299,861				Elevation	(m)	5.5			
Drilling	, date:		15/1/2003		Drillin	g machine:	XY	- 1A		Vetical sc	ale	1/100			
Inclinna	ation:	90 0		Depth:	10.0 m	l	Total core rec	covery:		Water lev	el	2.30 m			
Depth (m)	6 Elevation (m)	Lithology		Geo	logical des		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	10 20	SPT) 30	40	
	4.00		0 - 1.5m: Silty/0 brown, about 60 1.5 - 3.0m: Clay about 60% sand, 3.0 - 10.0m: Clay sand, 25% silt an	Clayey SAND to 80% sand, yey/Silty SAN 20% silt and 1 yey/SIlty SAN d 15% clay.	(SC), dry, 0 to 20% sil	dense, brownish g Ity and 5 to 20% cla et, medium dense, ay. t, dense, brownish	ray to yellowish ay. , brownish gray, gray, about %60			BR5/1 2.0 - 2.2					

E	Bore ho BR	le N ⁰ 6	Location:	Phuoc H	oa Commi	une, Tuy Phuoc D	istrict, Binh D	inh Provinc	e			1/	1 she	et	
X:	1,5	536,642			Y:	19,302,130				Elevation	(m)	4.85			
Drillin	g date:		17/1/2003		Drillin	g machine:	XY	- 1A		Vetical sc	ale	1/100			
Inclinn	ation:	90 ⁰		Depth:	10.0 m	1	Total core rec	covery:		Water lev	el	2.50 m			
Depth (m)	Elevation (m)	Lithology		Geo	logical des	cription		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	10 2	SPT 0 30	40
2.8	2.05 0.85 -2.35 -2.65		0.0 - 2.8m: Silt yellowish brown 2.8 - 4.0m: Sa 35% clay, 35% 4.0 - 10.0m: Silt brown to black g 7.2 - 7.5m: thin gray, about 35%	y/Clayey SAN , about 80% fif andy CLAY (o silt and 30% y fine SAND (S gray, about 90% lens of Sandy clay, 30% silt a	D (SM), slig ne sand, 109 CS), wet, sand. SM), wet, m sand and 19 CLAY (CS nd 35% san	ghtly wet, loose, br % silt and 10% clay. soft, gray to blac edium dense to dens 0% fine (clay/silty).	wwnish gray to k gray, about e, greenish								

ore hol BR7	le N ⁰	Location: <i>Nhon An</i>	Commune, An Nhon Dist	rict, Binh Dinh	Province				1/	1 sheet	
1,5	41,753		Y: 19,295,186				Elevation	(m)	8.25		
, date:		19/1/2003	Drilling machine:	XY	- 1A		Vetical sc	ale	1/100		
ation:	90 0	Depth:	10.0 m	Total core rec	overy:		Water lev	el	1.80 m		
Elevation (m)	Lithology	Geol	ogical description		Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water pressure test	SPT 10 20 30	40
6.75 6.35 3.25 2.45		 0.0 - 0.6m: Clayey/silty SAND brown, about 15% clay, 15% sil light compression. 0.6 - 5.8m: Silty SAND (SM) v dense, yellowish brown to brow sand, 5% fine (clay/silt) and 5% 5.8 - 9.4m: Sandy CLAY(CS) about 35% clay, 30% silt and 3% Below 9.4m: Silty SAND (SM) 95% fine sand and 5% fine (clay 	 (SM), slightly wet, loose, b t and : 13 - 15, sand: 65 - 70. with a little fine gravel, wet, nish gray, about 90% fine to gravel. wet, firm, greenish gray to 5 sand.), wet, medium dense, brow (silt) 	prownish gray to Soil is light wet, loose to medium medium-grained b brownish gray,			BR7/1 0.4 - 0.6				
	ore hol BR7 1,5 date: ation: (E) 6.75 6.35 3.25 2.45	ore hole N ⁰ BR7 1,541,753 date: ation: 90 0 Image: Second	ore hole \mathbb{N}^0 Location: Nhon AnBR7Iocation: Nhon An1,541,753ate:1,541,753ation:90 0Depth: \mathbb{E} Lithology \mathbb{E} Lithology \mathbb{E} <	ore hole N ⁰ Location: Nhon An Commune, An Nhon Dist BR7 1,541,753 Y: 19,295,186 i,date: 19/1/2003 Drilling machine: ntion: 90 0 Depth: 10.0 m intion: 90 0 O.0 - 0.6m: Clayey/silty SAND (SM), slightly wet, loose, I brown, about 15% clay, 15% silt and : 13 - 15, sand: 65 - 70. Ight compression. 6.75 0.6 - 5.8m: Silty SAND (SM) with a little fine gravel, wet, dense, yellowish brown to brownish gray, about 90% fine to sand, 5% fine (clay/silt) and 5% gravel. 3.25 5.8 - 9.4m: Sandy CLAY(CS), wet, firm, greenish gray to about 35% clay, 30% silt and 3% sand. -1.75 Below 9.4m: Silty SAND (SM), wet, medium dense, brow 95% fine sand and 5% fine (clay/silt).	Ore hole N ⁰ BR7 Location: Nhon An Commune, An Nhon District, Binh Dinh 1,541,753 Y: 19,295,186 1,541,753 Y: 19,295,186 gdate: 19/1/2003 Drilling machine: XY ution: 90 0 Depth: 10.0 m Total core rec 0.0 - 0.6m: Clayey/silty SAND (SM), slightly wet, loose, brownish gray to brown, about 15% clay, 15% silt and : 13 - 15, sand: 65 - 70. Soil is light wet, light compression. 6.75 0.6 - 5.8m: Silty SAND (SM) with a little fine gravel, wet, loose to medium dense, yellowish brown to brownish gray, about 90% fine to medium-grained sand, 5% fine (clay/silt) and 5% gravel. 3.25 5.8 - 9.4m: Sandy CLAY(CS), wet, firm, greenish gray to brownish gray, about 35% clay, 30% silt and 3% sand. -1.75 Below 9.4m: Silty SAND (SM), wet, medium dense, brownish gray, about 95% fine sand and 5% fine (clay/silt).	Interview of the second secon	Non An Commune, An Nhon District, Binh Dinh Province Instant Instant Y: 19,295,186 Instant Instant Instant Y: 19,295,186 Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant Instant	Interview of the second and the secon	Ore hole \mathbb{N}^0 Location: Nhon An Commune, An Nhon District, Binh Dinh Province 1,541,753 Y: 19,295,186 Elevation (m) (date: 19/1/2003 Drilling machine: XY - 1A Vetical scale ution: 90 0 Depth: 10.0 m Total core recovery: Water level $\frac{100}{1000}$ $\frac{1000}{1000}$ Geological description Degree of recovery (depth of water loss samples or spring Samples or spring 6.75 0.0 - 0.6m: Clayet/silty SAND (SM), slightly wet, loose, brownish grav to brown, about 15% clay, 15% silt and : 13 - 15, sand: 65 - 70. Soil is light wet, light compression. BR7/1 0.4 - 0.6 3.25 0.6 - 5.8m: Silty SAND (SM) with a little fine gravel, wet, loose to medium dense, vellowish brown to brownish gray, about 90% fine to medium-grained sand, 5% fine (clay/silt) and 5% gravel. S.8 - 9.4m: Sandy CLAY(CS), wet, firm, greenish gray to brownish gray, about 90% fine to medium-grained sand, 5% fine (clay/silt) and 5% sand. Below 9.4m: Silty SAND (SM), wet, medium dense, brownish gray, about 90% fine sand and 5% fine (clay/silt).	Open bole N ^d BR7 Location: Nhon An Commune, An Nhon District, Binh Dinh Province 1/ 1,541,753 Y: 19,295,186 Elevation (m) 8.25 (date: 19/1/2003 Drilling machine: XY - 1A Vetical scale 1/100 ttion: 90.0 Depth: 10.0 m Total core recovery: Water level 1.80 m Image: Construct of the state of the st	One hole N ⁰ BR7 Location: Nhon An Commune, An Nhon District, Binh Dinh Province 1/1 set 1,541,753 Y: 19,295,186 Elevation (m) 8.25 state: 19/1/2003 Drilling machine: XY - 1A Vetical scale 1/100 state: 19/1/2003 Depth: 10.0 m Total core recovery: Water leve! 1.80 m 100 Total core recovery: Geological description Degree of of vectory length of vectory length of vectory length (m) samples or spring Vetical cost Tester length (m) samples or spring Vetical cost Vetic

Bore hole N ⁰ BR8			Location: Cat Thang Commune, Phu Cat District, Binh Dinh Province								1/1 sheet				
X:	1,54	43,047	Y: 19,30!			19,305,222		Elevation (m)		2.64					
Drilling	, date:		21/1/2003		Drillin	Drilling machine: XY				Vetical scale		1/100			
Inclinn	ation:	90 0 Depth:			10.0 m	10.0 m Total core recovery:			Water level		1.40 m				
Depth (m)	Elevation (m)	Lithology		Geological description				Degree of weathering	Core recovery length (m)	N ⁰ & depth of samples	Depth of water loss or spring	Water SPT pressure test 10 20 30		40	
	-1.36		0.0 - 2.0m: Silty/ to black gray, ab and molluses bet 4.0 - 10.0m: San 35% clay, 30% s	Clayey SAND (out 20% clay, 2 ween 2 and 4 m ndy CLAY (CS) ilt and 35% fine	SM), sligh 0% silt and depth. , wet, soft, sand, cont	tly wet to wet, loose 1 60% sand, contain black gray to green aining a few shells a	, brownish gray ing a few shells hish gray, about and molluscs.								

Depth (m)	BR1	BR2	BR3	BR4	BR5	BR6	BR7	BR8
-0.5								
-1.0							5	5
-1.5	14	8		10	11	3		
-2.0			5				6	5
-2.5	9	10		12	12	3		
-3.0			5				6	3
-3.5	10	12		13	11	5		
-4.0			6				9	6
-4.5	11	16		15	13	7	10	
-5.0			4					4
-5.5	15	17		15	15	11	11	
-6.0			7					
-6.5	16	21		16	15	15		4
-7.0			10				12	
-7.5	22	23	10	16	23	14		5
-8.0							12	
-8.5		23	18	18	24	14		4
-9.0	24						14	
-9.5		24	19	18	23	16		5
-10.0								
-10.5	13	24	21	19			16	5
Maximum	24	24	21	19	24	16	16	6
Minimum	9	8	4	10	11	3	5	3
Mean	15	18	11	15	16	10	10	5

Figure J.4 N Value Distribution with Depth at Boreholes of BR1 to BR8 (1/2)



Figure J.4 N Value Distribution with Depth at Boreholes of BR1 to BR8 (2/2)