

Project Lam Dom Yai Changwat Ubanratchatt Site © Dam Location Left bank Elevation + 131.89	toni Logged Date 2 Drilling Method 2 Drilling Started 2 Drilling Finished	Nipong 28/11/34 Rotary 23/11/34 27/11/34	Hole No. DH. 3 Total Depth 20.00 m. Angle From Vertical 0 Bearing of Angle Hole Elevation of Groundwater ± 130.59		
Elevation (m.s.l.) Depth : n Core Size Core Size Core Sur	X:0(%) X:0(%) Degree Occupant Degree Occupant Degree Occupant Degree Occupant Degree Occupant Degree Occupant Oc	Strength (MPa) Log Symbol N-Value	Description Remark		
- ((-		noi	lium dense to dense, st.		
12		San mod gra	dstone; erately weathered, y to purple; fine coarse grained, (at		
3		gra	55-11.85 coarse ined), well sorted, l clemented, hard rock, ding fracture dip ing cross-bedding		
- 14 - 1		pla 14 goo	ne, smooth surface d core recovery, nted core.		
15 EMV		Sil	85 - 20.00 m. tstone and sandstone ghtly weathered, red purple;, fine grained		
17-1		sil	l sorted, fair cemented, iium hard to hard, tstone at 11.85-16.00e. i graded to fine sand, by sand at 19.40-		
18-		19.	.60m. bedding and cure not clear, no sile, good core covery, slightly		
9			nted core, maximum e langth 100 cm.		
20 V V Ook Salt	Dagree of Hardness	Degree of Weath	AND THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER OF THE OWNER OWNER OF THE OWNER		
 < -25% = Very Poor Rock 25 -50% * Poor Rock 50 - 75% = Fair Rock 75 -90% = Good Rock 90-100% = Very Good Rock 	1 = Very Soff Rock 2 = Soff Rock 3 = Medium Hord Rock 4 = Hord Rock 5 = Very Hord Rock	! = Fresh rock 2 = Slightly Weathere 3 = Moderately Weath 4 = Highly Weathered 5 = Completely Weath	nered Rock 3 = 5 - 10 " 5 X 10 - 10 " " Rock 4 = 10 - 50 " 10 - 5 X 10 " "		

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Project Lam Dom Yai (i Changwat Ubonratchatha Site & Dam Location Left bank Elevation + 132.44	ini.	Logged By V. Logged Date 7. Drilling Method Drilling Started Drilling Finished	/ 12/34 Rotary 28/11/34	Total Depth 30.00 m. Angle From Vertical 0 Bearing of Angle Hole		
Elevation (m.1) (m.) Coepth (m.) Core Size Core Run (ore Run X)(%)	X (0(%)	Hordness Degree of Wedness Degree of Degree of	Symbol N-Value	5 Description	Remark	
3	LA CARTA AND AND AND AND AND AND AND AND AND AN		0. ML Ap 10 7 to to ha 16 81 90 16 80 55 30 Ap 55 30 Ap 66 10 90 90 90	00 - 2.85 m Clayey Silt; p.20% fine sand, 80% w to medium plasticity nes, dark brown to brow yellowish brown, loose medium dense, moist, ve silty sand (SM) yer at 2.75-2.30 m. 85 - 3.85 m Silty sand; p.80% fine sand, 20% ightly plasticity fine llowish brown, dense, ist. 85 - 9.30 mSM. Poorly graded san p.90% coarse to fine nd, mostly fine sand, mrse sand at 8.85-9.30 % non plasticity fines llowish brown to light ay, dense to very nse, moist.		
9-3				30 - 10.50 m. I. Silty sand;	[⊃] ermeabllity	
RQD (- 25% = Very Poor Rock 25 - 50% = Poor Rock 50 - 75% = Fair Rock 75 - 90% = Good Rock 90-100% = Very Good Rock	Degree 1 = Very Sc 2 = Soft Ro 3 = Medium 4 = Hard Ro 5 = Very Ho	ock Hard Rock ock	I = Fresh rock 2 = Slightly Weather	= (Lugeor 2 = 1 - 5	TOT \$ 10 cm/5eq 10-5 X 10 m/5eq 5 X 10-10 m 10-5 X 10 m > 5 X 10 m	

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Project Lam Dom Yoi (D 28) Changwat Ubonratchatani Site © Dam Location Left abutment Elevation + 132,44	Logged By V. N Logged Date 7 Drilling Method Drilling Storted Drilling Finished	/12/34 Rotary 28/11/34	Hole NoDH. 4 Total Depth30.00 m Angle From Vertical Bearing of Angle Hole _ Elevation of Groundwat	0
Elevation Deom Deom Door Size Core Run Core Run Core Run Core Run X 10(00)	Degree of Perman Polity	(MPa) Log Symbol N-Value	Description	Remark
12 13 13 15 16 17 18 19	agree of Hardness y Saft Rock			î •
25 - 50% * Poor Rock 2 * 50 50 - 75% * Fair Rock 3 * 144 75 - 90% * Good Rock 4 * 144	1 Rock drum Hard Rock rd Rock y Hard Rock	2 = Slightly Weathers 3 = Moderately Weath 4 = Highly Weathered	d Rock 2 × 1 - 5 m hered Rock 3 * 5 - 10 m	iÕ¯6ΧiÕ¯ ;; 5χiÕ¯ iÕ¯ ,, iÕ¯5ΧiÕ¯ ,, > 5ΧiÕ¯ ,,



Elevation + 132.44	Drilling Mathed Drilling Syorted Drilling Finished	/12/34 Rotary 28/11/34	Hole NoDH .4 Total Depth _30.00 n Angle From Vertical _ Bearing of Angle Hole _ Elevation of Groundwat	Q
Elevation (m.s.) Deoth (m.) Costro Core Size Core Run Core Run (core Run (co	X 10/0% 10/0	(MPa) Log Symbol N-Volue	Description	Remark
22- - 23- - 24- - 25- 27- - 27- - 27- - 29-		24	d rock, clear cross ding, fractures dip 3° and 30° good core overy, pebby dstone at 21.00-21.70s tstone, red to purplis, few fissile, king, interval of tstone 21.70-28.50m.	
R Q D 4 - 25% = Very Poor Rock	Dugree of Hardness 1 = Very Soft Rock	Degree of Weath		Permeability
25 - 50% × Poor Rock	2 * Soft Rock	2 = Slightly Weathers	d Rock 2 = 1-5 n	10-6 X 10" "
50 - 75% = Fair Rock	3 = Medium Hard Rock 4 = Hard Rock	3 * Moderately Weath 4 * Highly Weathered	• <u> </u>	5 X 10 - 10 n - 10 - 5 X 10 - n
75 - 90 % = Good Rock 90-100 % = Very Good Rock	5 = Very Hord Pock	5 * Completely Weath	ered Rock 5 = > 50 "	> 5×104 »

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Project Lam Dom Yai (Changwat Ubonratchatho Site © Dam Location Right bank Elevation + 131.50	Fingged Date (Filling Method Drilling Started Dilling Finished	Nipong 6/12/34 Rotary 29/11/34 6/12/34	Hole NoDH.5
Elevation (m.s.l.) Depth (m.) Cooking (m.) Cooking Core Sun Core Sun Core Sun Core Sun	RQC (%)) RQC (%)) RQC (%)) Cogree Cegree Ceg	Strength (MPa) Log Symbol N-Volue	Description Remark
GWL 3 TRITING TO THE TOTAL TOTAL TO THE TOTAL TOTAL TO THE TOTAL TO	Degree of Hardness	0.0 SM. App low 6 top 2 1.3 II SP- App non 16 moi 4 19 50 Ser Vec fire cre cre cre cre cre cre cre cre cre c	
 < -25% = Very Poor Rock 25 - 50% * Poor Rock 50 -75% = Fair Rock 75 -90% = Good Rock 90 -100% = Very Good Rock 	1 = Mery Soft Rock 2 + Soft Rock 2 + Madium Hord Rock 6 = Hord Rock 5 + Mery Hord Rock	1 = Fresh rock 2 = Slightly Weathere 3 = Moderately Weath 4 = Highly Weathered 5 = Completely Weath	erad Rock 3 = 5 - 10 " 5 X 10 - 10 " " Rock 4 = 10 - 50 " 10 - 5 X 10 - 1

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Chor Site	ictL igwat 	Ziqb gm Ųt	ooni it_t	otch oank	n at hign			.o ygad Orilling Orilling Orilling	By V. Date Mathod Starind Finished	6/12/ Rota 29/	/34 ry 11/34			Total De Angle F Bearing	DH.5 spth_30_00 m from Vertical of Angle Hole_ on of Groundwat	<u>0</u>
Elevation (m.s.l.)	Dapm Im.	Costang	Core Size	Core Pun	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	X O.S.			Degree of	Strength (MPc)	Log	N-Value		Descri	otion	Remark
	15 € 15 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16		New New							II	4 4 4		roi jo: \$1: he: 8.:	inted cor ndstone a ltstone; rd, inter 50-8.70m.	ace, very e, pebby t 12.90-13.10 purple, medicalated at , 10.20-10.30	JR:
4	17 18 19	.				D	ograve	C. Harc	iness	. 17 18 19	Degree	of	80 16 20 30 41 28 23	th siltst ndstone; athered, ained, fe 11 cement actures (-5° smoot rface, go covery, p ndstone a d 23.50-2	ntercalated cone slightly purple; find ir sorted, led, hard rocklip about the and clean and core lebby at 20.60-21.5023.20%.	
25 - 5 50 - 7 75 - 9	5% = 1 0% = 1 5% = 0 0% = 0	Very Poo Fair 300	y Po r Ro Ro	ock ick lock		= \/e 2 = 50	ry Sot ft Moc dum 2 cd Roc	Rock k Hard Ri	ock.	2 = 1 3 = 1 4 = 1	Modera Highly \	We !ely ⊮eo!	othere Weatt	od Rock nered Rock I Rock nered Rock	2 = 1-5 "	n or { 10 cm/Sec 10 − 5 X 10 π/ 5 X 10 − 10 π/ 10 − 5 X 10 π/ > 5 X 10 π/ > 5 X 10 π/ »

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Chon Site	gwat Ut	ntudo "t <u>f</u> t	nani .	Lagged By V. Nipong Lagged Date 6/12/34 Orilling Method Rotory Drilling Started 29/11/34 Drilling Finished 6/12/34				Hole No. DH. 5 Total Depth 30.00 m Angle From Vertical 0 Bearing of Angle Hole Elevation of Groundwater ± 128.20		
Elevation (m.s.i.)	Coppin Costs	Core Size	44888488918 X O (%) X O (%) 8 O (%)	Hordness Degree of Permen	Strength (MPa)	Log Symbol	N-Value	Description	Remark	
	Sland		Communication of the Communica		21-	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	he 17	ltatome; red to purpli d, few fissile, medium rd, intercalated at 2.00-17.50m. and 2.50-27.50 m.	≰ h	
	23				23					
	24	Nwm			24- 25-					
	26	N			26					
	27-				27-				}	
	28		A continue of the continue of		28					
	30) RQ	D y Axor 900	a a∦a sa≅a	ee of Hardness	30		of Weat		Permeability	
25 - 5 50 - 7 75 - 9	0% * Poi 5% * Fai	or Rock r Rock	2 + Soft 1 2 = Medic 4 = Hard	Rock m Hard Rock	2 = 3 = 4 =	Slightly Moderat Highly V	Weather ely Wea /eathere	red Rock 2 × 1 - 5 ") thered Rock 3 = 5 - 10 "	io ta xio tanga s xio tanga s xio tao ta s xio tao tao s xio tanga s	

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Project Lam Dom Yai (Changwal Ubanratchathar Site .	ni tingged Date! Drilling Method _	Nipong 5/12/34 Rotary 9/12/34 13/12/34	Hole No DH. 6 Total Depth _ 20.00 m Angle From Vertical _ 0 Bearing of Angle Hole Elevation of Groundwater + 128.63
Elevation (m.s.l.) Depth (m.) Cosing Core Size Core Run Tore Run	Theorem of	Strength (MPa) (Log Symbol N-Volue	Description Remark
GWL 3 XV	Degree of Flardness	0. SM Ap 91 91 91 91 91 91 91 91 91 91 91 91 91 9	i. Silty sand; ip.80% fine sand, 20% ightly plasticity fines, illowish brown to brown iose, moist, top soil. 30 - 6.30 m. 2-SM. Poorly grades sand ip.90% medium to fine ind, mostly fine sand, i% non plasticity ines, yellowish brown in gray, medium dense to inse, woist, flood plane iposit. 30 - 6.70 m. 4. Silty sand ip.80% fine sand, 20% ightly plasticity ines, reddish brown, iist, completely eathered of sandstone 70 - 10.00 m. indstone inderstely weathered, eddish purple; fine sained, fair sorted, hering Degree of Permeability
(-25% = Very Poor Rock 25 -50% ≠ Poor Rock	L = Very Soft Rock 2 + Soft Rock	1 = Fresh rock 2 = Slightly Weather	
50 -75% = Fair Rock 75 -90% = Good Rock	5 = Medium Hard Rock	4 = Highly Weathers	thered Rock 3 = 15 - 10 , 5 X 10 = 10 , n d Rock 4 = 10 - 50 , n d = 5 X 10 , n
90 - 100 % = Very Good Roxix	5 - Very Hord Rock	5 = Completely Weat	hered Rock 5 = > 50 " > 5 X IO "

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Project Lam Dom Yai Changwat Ubonratchat Site © Dam Location Right bank Elevation ± 131.73	1	5/12/34 _Retary _9/12/34	Hole No DH_ 6 Total Depth _ 20.00 n Angle From Vertical Bearing of Angle Hole _ Elevation of Groundwat	0
Elevation (m.s.) Jepth (m.s.) Jepth (m.s.) Core Size (w. Core Run (m.	X 10.00	Strength (MPa) Log Symbol N-Value	Description	Remark
12 13 14 15 16 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19			ir to well cemented, dium hard to hard rock ear cross-bedding, octure dip about 3 -5 90 rought surface is stained with fe-oxidary jointed core. 100 - 20.00 m. 100 - 20.00 m. 100 - 20.00 m. 101 - 20.00 m. 102 - 20.00 m. 103 - 20.00 m. 104 - 20.00 m. 105 - 20.00 m. 106 - 20.00 m. 107 - 20.00 m. 108 - 20.00 m. 108 - 20.00 m. 109 - 20.00 m	
1/00 C - 25% = Very Pixor Rack 25	Degree of Hardness L. Herry Soft Rock 2 / Soft Rock 5 = Medium Hard Rock 6 = Hard Rock 5 = Very Hard Rock	Degree of Weath 1 = Fresh rock 2 = Slightly Weathere 3 = Moderately Weath 4 = Highly Weathered 5 = Completely Weath	t × (Lugeor d Rock 2 × 1 − 5	Permedality or { IO cm/Sec IO 5 X IO n 5 X IO 10 n IO 5 X IO n 5 X IO n > 5 X IO n > 5 X IO n

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Project Lom Dom Yoi (Changwat Ubonrotchathat Site & Dam Location Right abutment Elevation +132.02	ni Logged Date Urilling Metho Duilling Start Duilling Finish	V. Nipong 20/12/34 od Rotary ad 14/12/34 ned 18/12/34	Total Depth 20.00 m. Angle From Vertical 0 Bearing of Angle Hole		
Elevation (m.s.i.) Depth (m. Cosero Core Sur Core Sur Core Sur Core Sur	Control of the contro	Strength (MPa) (Log Symbol N-Value	Description	Remark	
GWL 2		7 2 6	0.00 - 4.00 m. SM-SP. Silty sand App.90% fine sand, 10% non plasticity fines, yellowish brown, loose to medium dense, moist.	i.	
2 4 2 6 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		3- 10 4 7 57 9	4.00 - 7.30 m. SP. Poorly graded sand App.95% fine sand, 5% non plasticity fines, brown to gray, medium dense to very dense, mois		
8-1 9 EMV	Degree of Hardness			Parmaobility	
(-25% = Very Poor Rock 25 -50% = Poor Rock 50 - 75% = Fair Rock 75 -90% = Good Rock 90-100% = Very Good Toose	1 : Very Soft Rock 2 * Soft Rock 3 * Medium Hard Rock 4 * Hard Rock 5 * Very Hard Rock	4 = Highly Weath	thered Rock 2 × 1-5 n Weathered Rock 3 = 5-10 n hered Rock 4 = 10-50 n Weathered Rock 5 = 2 50 n	n or { 10 cm/sec 10 - 5 X 10 1 1 5 X 10 - 10 7 7 10 - 5 X 10 7 7 > 5 X 10 7 7	

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Project Lam Dom Yai	(0.28) Logged By V. I	Nipong	Hole No. DH. 7	
Changwat Ubonrat Chatha			Total Depth 20.00 n	
Site & Dam	Drilling Mathod Drilling Skirted		Bearing of Angle Hole	
Location Right abulment Elevation ± 131,02	Drilling Started Drilling Finished		Elevation of Groundwat	
Elevation 117 197905			Clevation of discondition	
Elevation Depth Depth Co. Siza Co. Siza Co. Siza Siza Siza Siza Siza Siza Siza Siza	Hordness Berner of Control of Con	Symbol Symbol N-Value	Description	Remark
			inted core. 00 - 20.00 m.	
		\$30 81 51	ndstone interculated th siltstone. ightly weathered.	
12		gr an	ddish purplè;. fimo mined, well morted d cemented, medium har hard rock, bedding	
- 13-1		13 di 30 81	p 3 ⁰ fractures dip -5°, jointed core, ltstone, red,	·
_ 14_		15	tercalated at 12.0050 lm. and graded to	
IS EMV		15		
- 16		16		
17-3		17		
18		18		
- 19		19		
20; (V)	Degree of Hordness	Degree of Weath	ering Degree of F	remeability
C - 25% = Very Puor Rock	1 : Mary Saft Rock	! = Fresh rock		or (10 cm/Sed
25 - 50% * Poor Rock	2 - Soft Rock	2 = Slightly Weathers	• · · · · · · · · · · · · · · · · · · ·	10-8 X 10 "
50 - 75 % = Fair Rock	3 - Madium Hord Rock	3 = Moderately Weath		5 X 10 10 n
75 90% = Good Rock	4 = Hard Rock	4 = Highly Weathered	Rock 4 = 10-50 n	IO-5XIO "
90-100% = Very Good Root	# = Mary Hord Rock	5 Completely Weath	ered Rock 5 = > 50 //	> 5XIO ^A »

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Chor Site	nct Lam nawat <u>U</u> & Dar tion Ri	bonratet n	nathai	n	1	eggo. millirí	ote ethod	Nipon 24/12/ Rota	/34 !Y	~ ~ ·	Total Depth 15.00 m. Angle From Vertical 0	
Elevo	itiont.l	32.75			,							
Elevation (m.s.l.)		Some Size	1000 X	(%) (%)	Segrees	Degree	Weathering	kujig.	Strength (MPd)	Log Symbol	N-Value	
GWL	2 3 4								2-		9 12 15	App.90% fine send, 10% non plusticity fines, brown, medium dense, moist.
	5-						X X XX		5. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		5 4	SM-SP. Silty sand; App.90% fine sand, 10% non plasticity fines,
	7-11	Nwm							7			5.60 - 7.00 m. Sandstone; moderately weathered, gray, fine grained, well sorted well cemented, hard rock, fractures dip about 20-30, 600
	10.1 9				oorde	of Har	40		9-	Deares	of	and 90°, good core recovery. 7.00 - 15.00 m. Sandstone intercalated with siltatone; Wedthering Degree of Permapbility
25 - 5 50 - 7 75 - 9	RQ 5% = Ver 0% = Poo 5% = Foil 0% = Goo 0% = Ver	y Poor F or Rock r Rock od Rock	1		y Soft It Rock tium H rd Roc	Rock k lard F k	lock		2 = 5 3 × 1 4 = 1	Fresh r Slightly Wodsroi	ock Wed tely	

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Project Lam Dom Yai (D Changwat Ubonratchathani Site Dam Location Right abutment Elevation + 132,75	t.ogged Date24 Drilling Method! Drilling Started _ ! Drilling Finished _	1/12/34 Rotary 9/12/34	Hole No DH_ 8 Total Depth _ 15_00 m Angle From Vertical Bearing of Angle Hole _ Elevation of Groundwat	0
	XOC X:0/6/2	(MPa) Log Symeol N-Value	Description	Remark
12 C A A A M		slig purp grai well bedd dip surf record slig sili medi	ghtly westhered, clish gray, fine land, fair sorted, land, fair sorted, land rock, fing dip 3°, fracture 2°-3° smooth and lace, good core overy, jointed to ghtly jointed core stone; red, no fissilum hard, intercalated 12.00-15.00 m.	•
25 - 50% = Poor Rock 50 - 75% = Fair Rock 75 - 90% = Good Rock	5 = Marijum Hard Rock L= Hard Rock	Degree of Weath I = Fresh rock 2 = Slightly Weathere 3 = Moderately Weath 4 = Highly Weathered 5 = Completely Weath	x (Lugeor d Rock 2 = 1 - 5 11 12 13 14 15 15 16 17 16 16 16 16 16 16	Permeability or ⟨ 10 cm/Sec 10 - 5 X 10 - 3 5 X 10 - 10 - 4 10 - 5 X 10 - 3 > 5 X 10 - 11

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Project Lam Dom Yai (E Changwat Ubonratchathan Site — Dam Location — Right abutment Elevation — + 141.02	i ! sigged Date 2 Drilling Method Drilling Started : Drilling Finished	Nipong 28/11/34 Rotary 22/11/34 26/11/34	Hole No. DH. 9 Total Depth. 15.99 m. Angle From Vertical 9 Bearing of Angle Hole	
Elevation Coeph (T.) C	No. (%)	Strength (MPa) Log Symbol N-Volue	Description Rem	nork
2 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	Pagree of Hardness	0.0 SP- Apple note to part to to to to to to part to	20 - 1.00 m. -SH. Poorly graded sens. 2.90% fine send, 10% 2.90% fine send, 10% 2.90% fine send, 10% 2.90% fine send. 2.00 - 3.50 m. 2.51ty send. 2.05% fine send, 15% 2.6thy plesticity 2.70% fine send with 2.8e gravels, hard, 2.9ular to round of 2.70% fine send with 2.8e gravels, hard, 3.9ular to round of 2.1ty send. 3.1ty fines, brown 3.1ty fines, brown 3.1ty fines, brown 3.1ty send. 4.1ty send. 5.1ty send. 6.1th send with send gravels, 6.1th send send send send send send send send	ii ty
 < -25% = Very Poor Rock 25 - 50% = Poor Rock 50 - 75% = Foir Rock 75 - 90% = Good Rock 4 	Very Soft Rock Soft Rock Medium Hard Rock Hard Rock Very Hard Rock	4 = Highly Weathered	hered Rock 3 = 5 - 10 " 5 X 10	(10° " 10° " (10° "

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Project Lam Dom Yoi (C) Changwat Ubonratchathani Site Q Dam Location Right abutment Elevation + 141.02		Rotory 22/11/34	Hole No. DH. 9 Total Depth 15.00 m. Angle From Vertical 9 Bearing of Angle Hole Elevation of Groundwater ± 137.52
Elevation (m.s.) Coph (m.s.) Costo	ROTE OF COMMENT OF COM	(MPa) Log Symbol N-Value	Description Remark
12 EMX 15 15 15 15 15 15 15 15 15 15 15 15 15		angu quar maxi 85% yell hard west 8.80 Send fine fair ceme 20-3 cles core	lar to round of tz, mostly sub-round mum size=2x3 cm., low plasticity fines, ow to yellowish brown, , moist, completely hered of siltstone. - 9.50 m. stone; ly weathered, purpale, grained, well sorted, cemented (poor nted at 8.80-8.90m.) um hard rock, tures dip about and 90 smooth and n surface, very jointed - 15.00 m. stone intercalated siltstone;
25 -50% * Poor Rock 2 50 -75% = Fair Rock 3 75 -90% = Good Rock 4	Ongree of Hardness Vary Soft Rock 2 - Soft Rock 3 - Medium Hard Rock 4 - Hard Rock 5 - Very Hard Rock 5 - Very Hard Rock	mode purp feir ceme to h dip 70 , good mexi very silt come slek	rately weathered, le, fine grained, sorted, fairlywell nted, medium hard and rock, bedding 3° fracture dip 45°, rought surface, core recovery, mum core length=37cm jeinted core, stone; red, fair nted, medium hard, ing interval:10.80-1.40 m., 12.00-12.10m. 1 × (! Lugeon or < 10 cm/Sec flock 2 = 1-5



Project Lam Dom Yai (Changwat Ubenratchatha Site © Spillway Location Right abultment Elevation + 141.49	Ini Logged Date! Drilling Method . Drilling Started Drilling Finished	8/12/34 _Rotary _16/12/34 _16/12/34	Hole No DH. IO	as as as
Elevation Depth (m.) Coarre Coarre Core 2.n	X 10(%)	Strength (MPa) Log Symbol N-Vatue	D es cription	Remark
2 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0.4 SM Applion 7 100 SC Applion 16 and 21 A. SM Applion 33 pu de we 52 7- 24 8 36 9	200 - 2.00 m. Silty send; p.80% fine send, 20% w plasticity fines, llowish brown to brown cse, moist, topscil. 200 - 4.50 m. Claysy send; p.60% coarse to fine nd, 40% medium esticity fines, gray d reddish spotted, dium dense to dense, ist, residual scil. 50 - 9.40 m. Silty send; p.70% fine send, 30% ightly plasticity fines, rple, dense to very nse, moist, completely athered of siltstone.	
RQD (- 25% = Very Poor Rock 25 - 50% × Poor Rock 50 - 75% = Fair Rock 75 - 90% = Good Rock 90-100% = Very Good Rock	Degree of Hordness I : Very Soft Rock 2 * Soft Rock 3 * Medium Hurd Rock 4 * Hard Bock 5 * Very Hord Rock	i = Fresh rock 2 = Slightly Weathers	I × (Lugeon or 2 × 1 - 5	married arminist



Project Lam Dom Yai (D.28) Changwat Ubonratchathani Site & Spillway Location Right abutment Elevation + 141,49	1 Logged By V. Logged DateU Drifting Method Orthing Started Drifting Finished	8/12/34 Rotary 16/12/34	Hole No. DH. 10 Total Depth 10.40 m Angle From Vertical 2 Bearing of Angle Hole 2 Elevation of Groundwate	
Elevation Depth Depth (m.s.t.) Codency Codency Code Size Code Size Code Size Code Size Code Size Code Size	Degree of Person Degree	Symbol N-Volue	Description	Remark
		fair	ly weathered, red, cemented, soft to um hard rock, ing.	
ROD	∩agree of Hardness	Degree of Weather	ng Degree of P	ermeobliity
25 - 50% + Poor Rock 2 + 5 50 - 75% = Foir Rock 3 + 5 75 - 90% + Good Rock 4 + 1	Ary Soft Rock Soft Rock Hedrum Hurd Rock Hard Rock Jacy Hard Rock	1 = Fresh rock 2 = Slightly Weathered 3 = Moderately Weathered 4 = Highly Weathered Ro 5 = Completely Weathere	ed Rock 3 = 5 = 10 n	or (10 cm/Sec 10 −5 X 10

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Chon Site	ct Lan ngwat Spill tion Ric ntion+138	Jbon way ght	rats obi		ini †		Co gge Orillic Ocabir Ocabir	id D ig M ig S ig F	ate Vinte Isthod	21/12/ Rote . 17/11.	′34 iry ≥/34.		Total Depth 9.00 m. Angle From Vertical 0 Bearing of Angle Hole
Elevation (m.s.î.)	Cases	Core Siza	Core Run	(0.00) (0	X 0.2 X 0.2 %		Degree	Weotherno	Permen and Party of the Permen and Party of the Permen and Party of the Permen and Perme	Strength (MPo)	Log Symbol	N-Value	Description Remark
GWL	2 3 4 5 6 7 8 9 RQ	MWN								1 2 3 4 5 6 7 8 9 9	Degree	31 29	medium dense, moist.
25 ~ 5 50 ~ 7 75 ~ 9	5% = Ver 50% = Poi 5% = Foi 90% = Goi	y Po or Fro r Ro od Fl	ock ock		1 = Vei 2 = So 3 = Me 4 = Ha 5 = Vei	y Sof FI Roc dium I rd Ro	t Roc k lard ck	k Rock		2 = 1 3 = 1 4 = 1	vkodera lighly \	Wei tely Meat	k i * (Lugeon or 10 cm/sec sothered Rock 2 * i - 5 10 - 5 \times 10 \times , \times 10 - 5 \times 10 \times , \times 10 - 5 \times 10 \times 1

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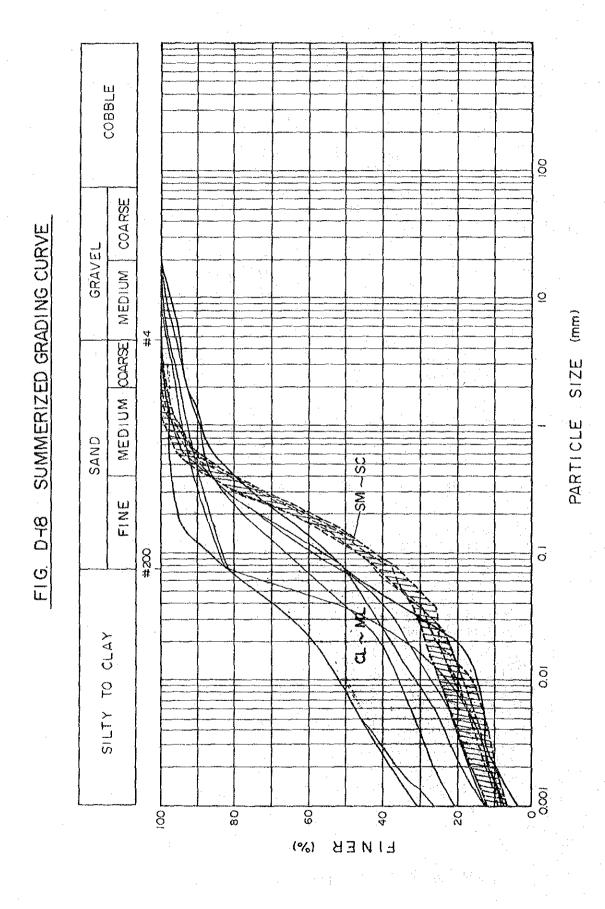
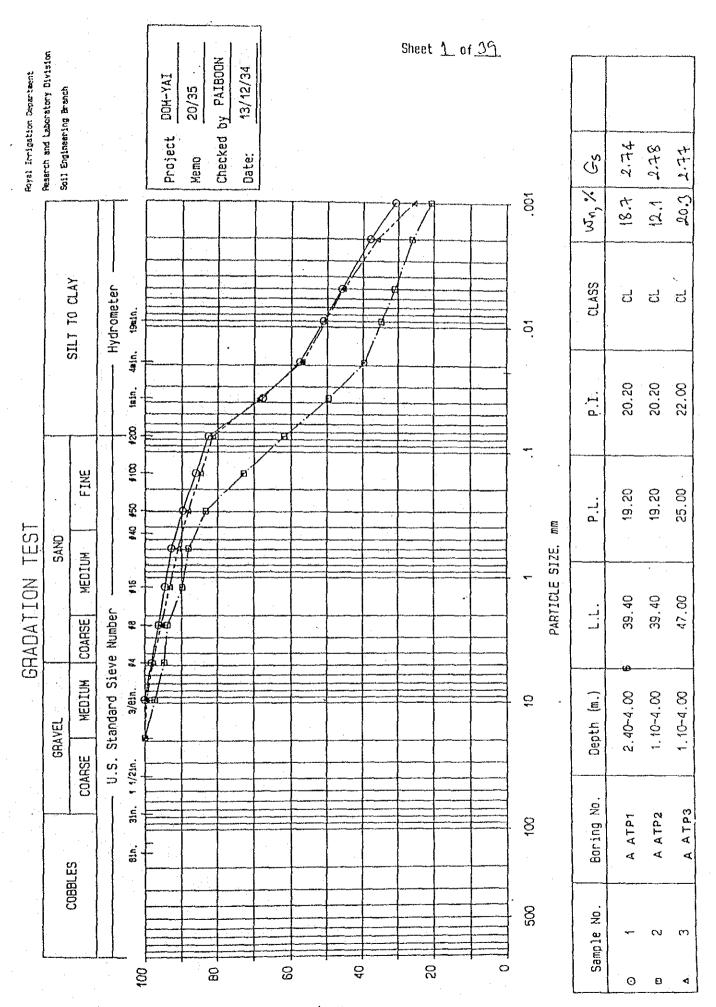


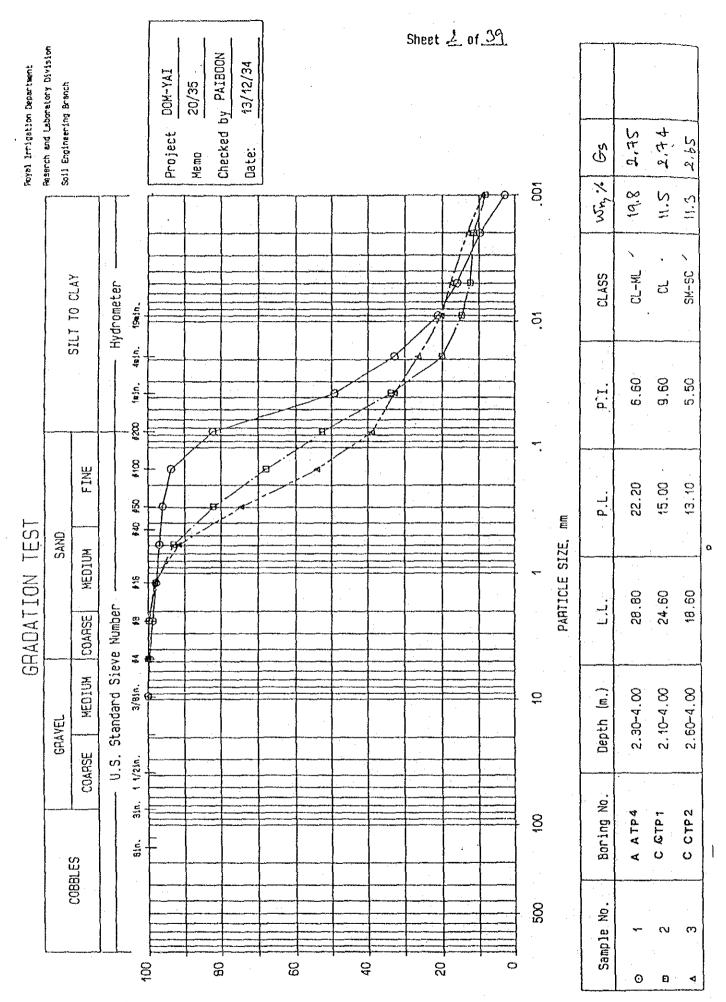
FIG. D-19 RESULT OF SOIL TEST

บันทึกข้อความ

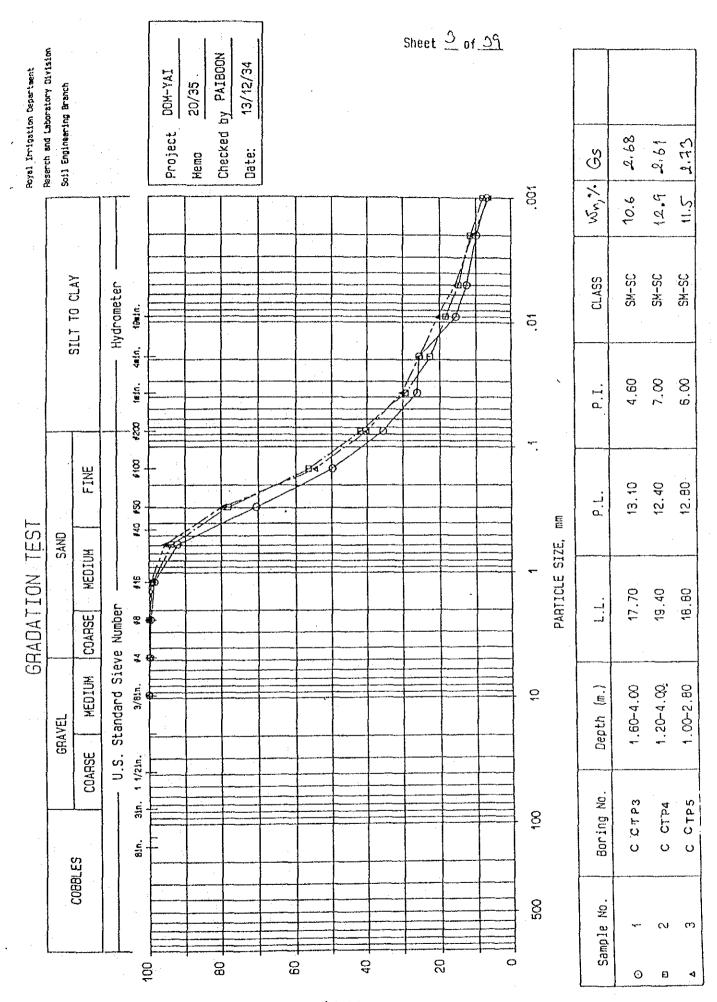
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ายสำรวจปถพีวิทยา กองวิทยาการธร			
no. 20/2535	_		* 113 V 114
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จึงเรียนมาเพื่อโปรคพิจา	ารณา		
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בת בבחתונים עותישוני) שרת טוזת	4124240	ผวก.	23.มก.253
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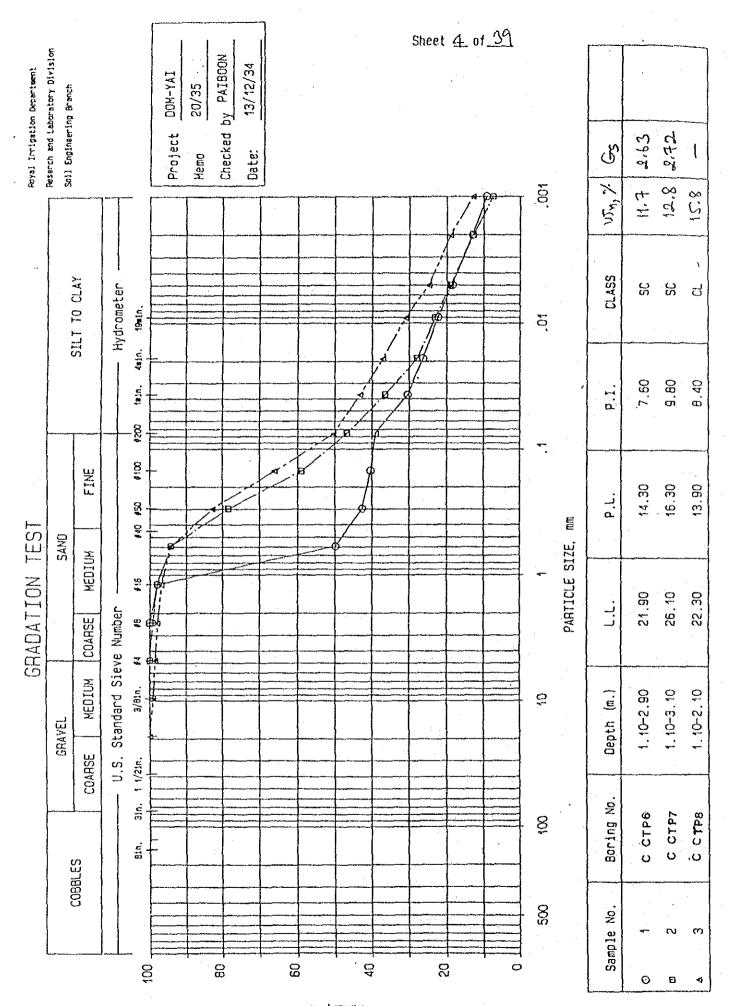
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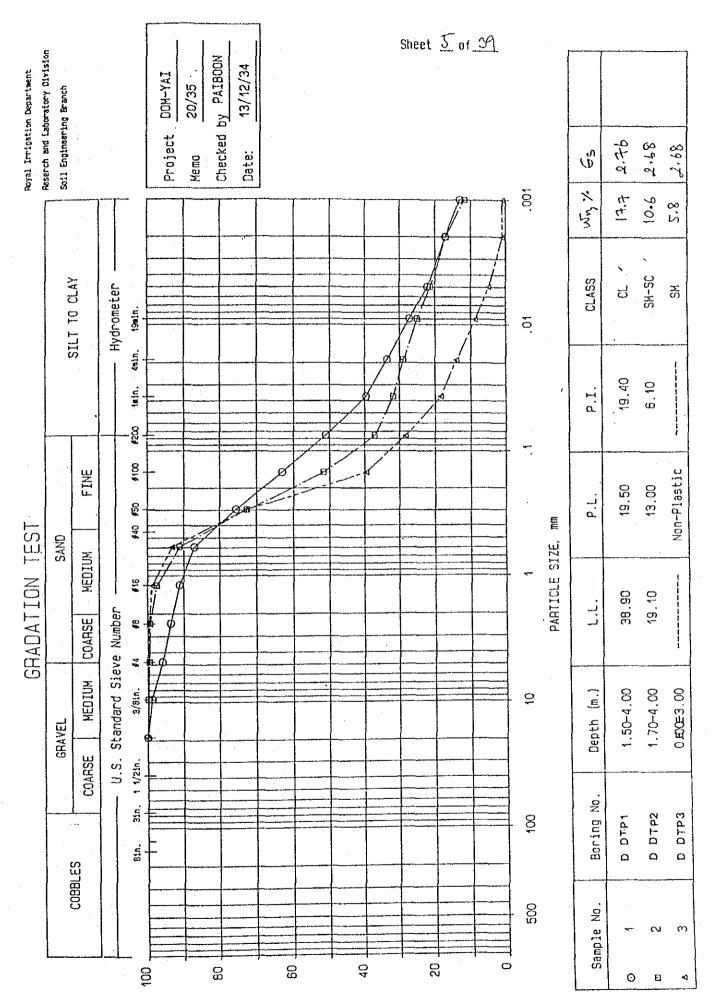
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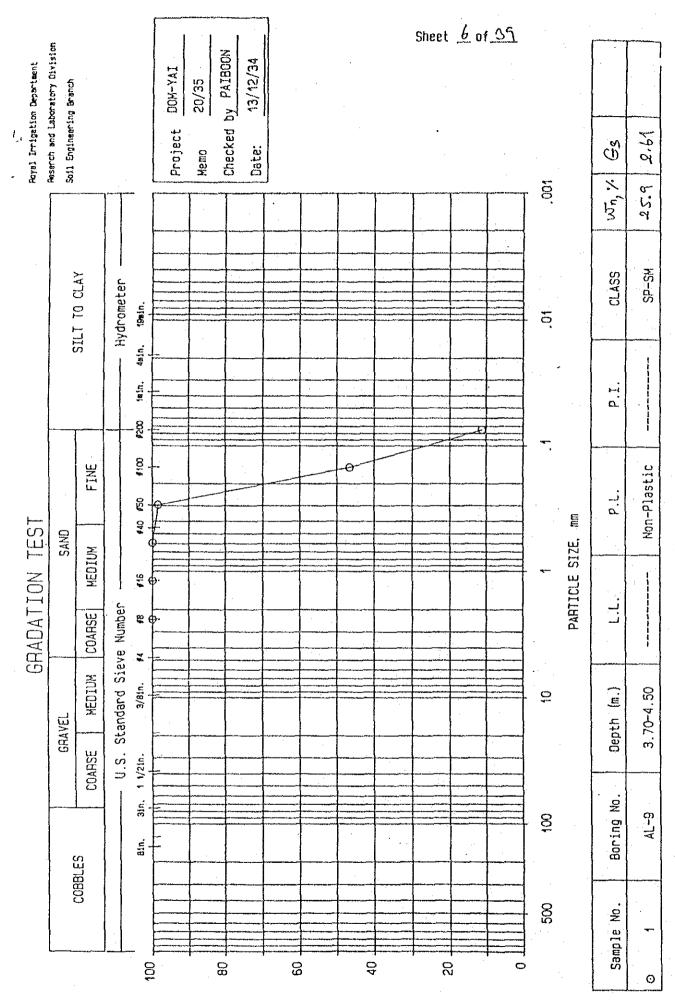
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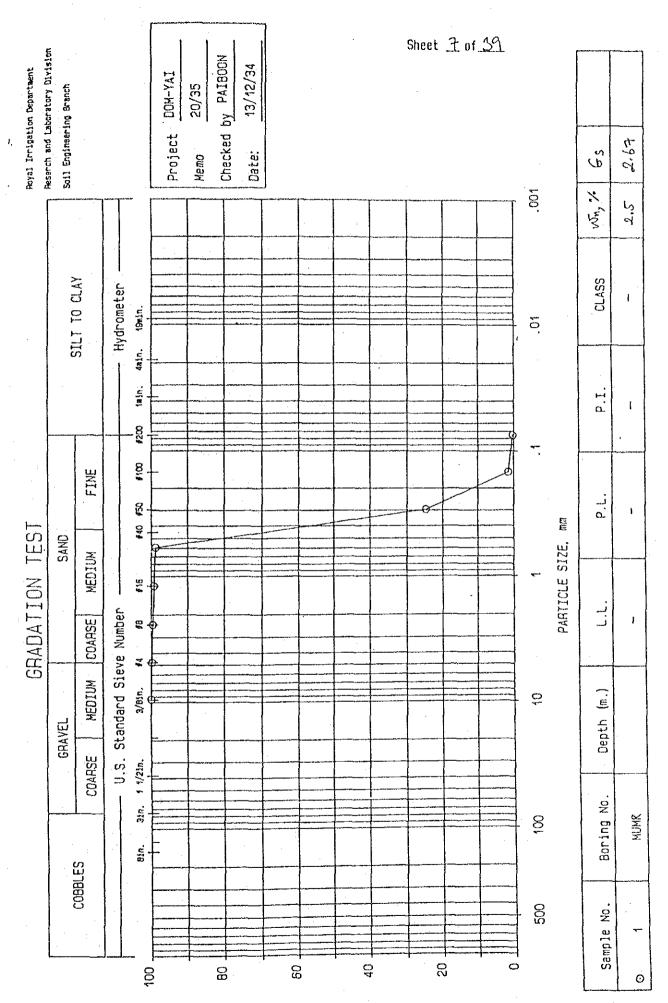
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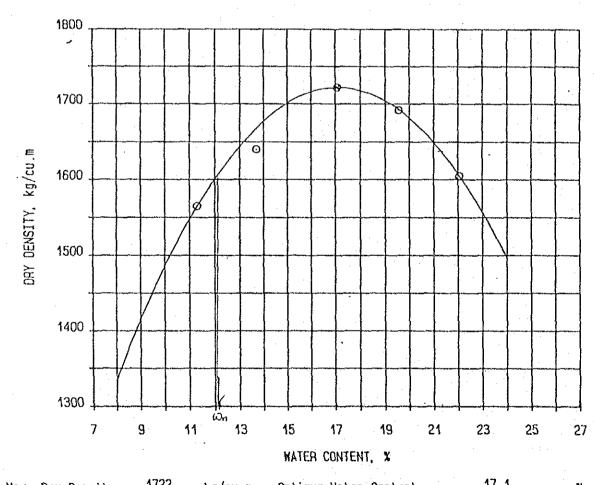
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RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

PROJECT	IAY-MOD		мемо	20/35
LOCATION			e te t	
BORING	A ATP2		TEST NO.	
SOIL DESCRIPTION			DEPTH	1.10-4.00
TESTED BY	SALA-SUVIT		DATE '	13/12/34
CHECKED BY	PAIBOON	В	DATE	13/12/34



Max. Dry Density 1722 kg/cu.m Optimum Water Content 17.1

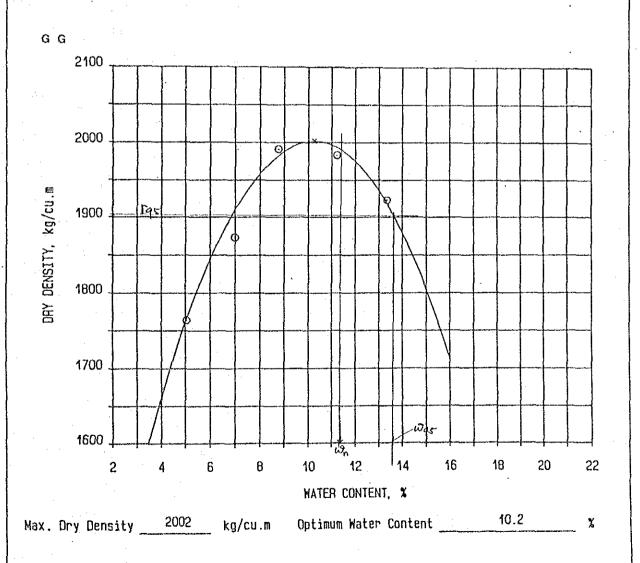
Sheet g of S

ROYAL IRRIGATION DEPARTMENT RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

PROJECT LOCATION	IAY-MOD	NEMO	20/35
BORING	C C TP2	TEST_NO.	
SOIL DESCRIPTION		DEPTH .	2.60-4.00
TESTED BY	SALA	DATE	13/12/34
CHECKED BY	PAIBOON	DATE	13/12/34



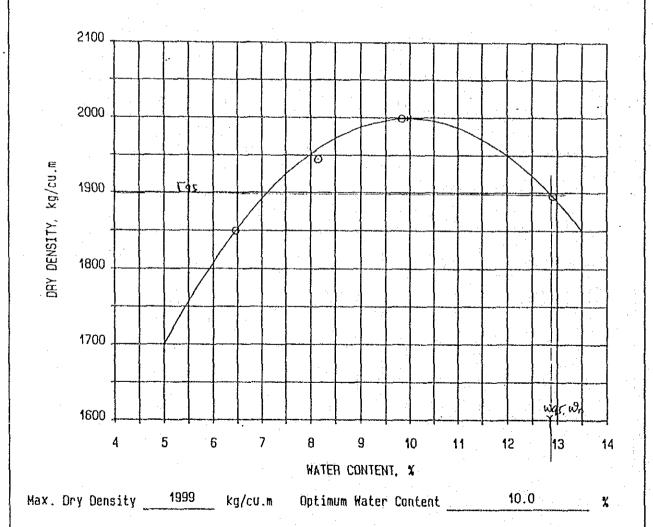
Sheet 9 of 39

RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

PROJECT	DOM-YAI	MEMO	
LOCATION		America	
BORING	C CTP4	TEST NO.	
SOIL DESCRIPTION		DEPTH	1.20-4.00
TESTED BY	SUVIT	DATE	17/12/34
CHECKED BY	PAIBOON	DATE	17/12/34



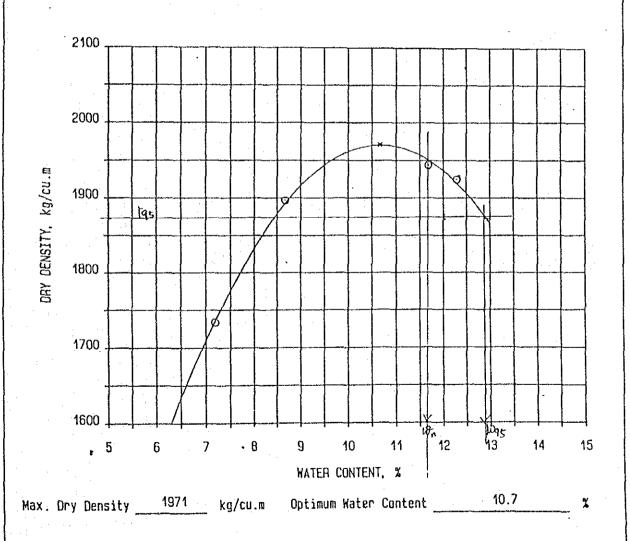
Sheet 10 of 39

RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

PROJECT	TAY-MOD		мемо	20/35
LOCATION				
BORING	C CTP6		TEST NO.	
SOIL DESCRIPTION		,	DEPTH	1.10-2.90
TESTED BY	SALA		DATE	13/12/34
CHECKED BY	PAIBOON PAIBOON		DATE	13/12/34



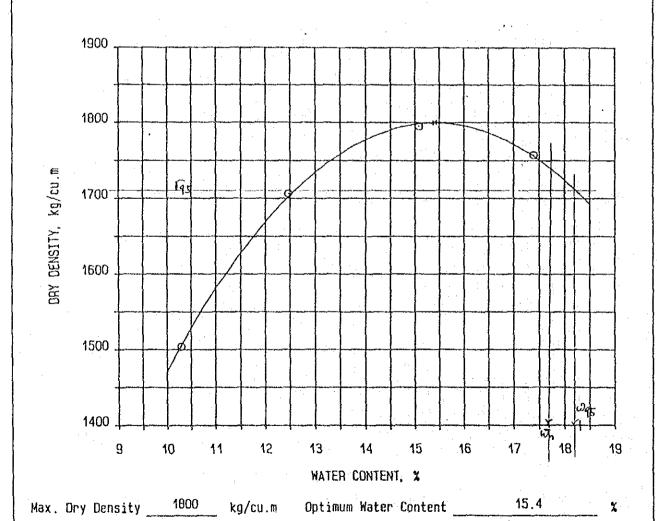
Sheet 11 of 39

RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

PROJECT	IAY-MOD	мемо	20/35
LOCATION			
BORING	D DTP1	TEST NO.	
SOIL DESCRIPTION		DEPTH	1.50-4.00
TESTED BY	SALA-SUVIT	DATE	13/12/34
CHECKED BY	PAIBOON	DATE	13/12/34



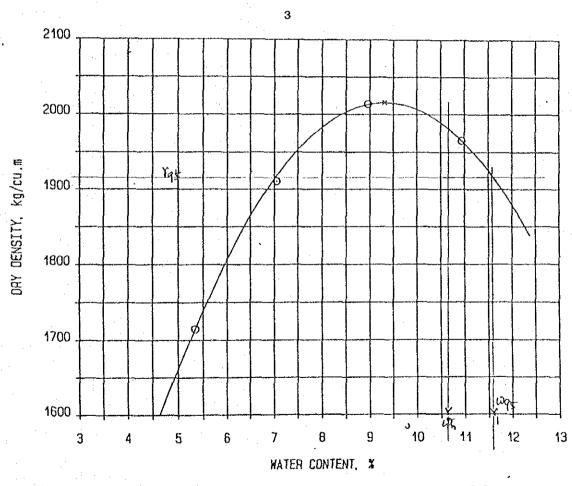
Sheet 12 of 39

RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

COMPACTION TEST

	•••		
PROJECT	DOM-YAI	МЕМО	20/35
LOCATION			· :
BORING	D DTP2	TEST NO.	
SOIL DESCRIPTION		DEPTH	1.70-4.00
TESTED BY	SALA-SUVIT	DATE	13/12/34
CHECKED BY	PAIBOON PAIBOON	DATE	13/12/34



Max. Dry Density 2016 kg/cu.m Optimum Water Content 9.3

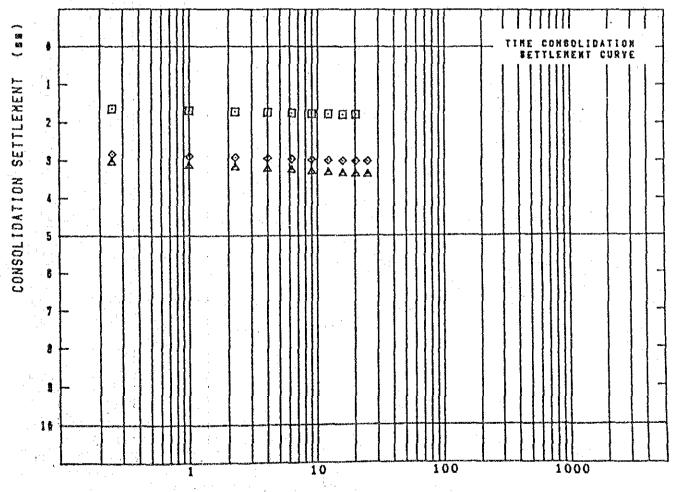
Sheet <u>13</u> of <u>39</u>

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ė.	LOCAL	117/					-		D	ATE	2:	3-12-	2534	ļ
HPLE	NO.	AND DEP	TH_No.	A A	TP2	alleria de la marquista de la m La marquista de la marquista d		-3-1-C 14-2-1003	and a second	ыфРОСКИ _{ТОРА} БДИО-КА	1.1m	•	4.0m	
8	-	H PARANE		<u> </u>	Cikgf/cs2	η φ DEGI	REE	ten	φ	ctks	//ga*)	\$.0E	SREE	
OPE TRES	OF MOR	HAL BOLIDATE	D RECI) H	0.28	19.8	31	0.	356					!
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D-133

DIRE	CT SHEAR TEST	(CU)	INITIAL CONDITION	FOR REPORTING
NAME OF SURVEY	LAN-DON-YAI	-		- Handrid Tage Lags . m.		والمنطقة المساولة المساولة المراوية والمساولة والمنطقة المائدة والمساولة والمراوية والمراوية والمراوية والمراوية
& LOCALITY					DATE	123-12-2534
SAMPLE NO. & DEPTH	No. A ATP2				,	l tea d file

	SPECIMEN NO.	No.1 🖸	No.2 0	A E.OH	No.	Ho.	
YES	RTICAL LOAD = kgf/cs	0.51	1.02	1.53			
TION	HEIGHT hocs	2.54	2.54	2.54			
	DRY WEIGHT Wag	130.87	130.85	130.95		A COLUMN TO SERVICE AND ASSESSMENT OF THE PARTY OF THE PA	
S X	SUBSTANCE HEIGHT he ce	1.496	1.496	1.497	And the second s		
	VOID RATIO ##	0.898	0.898	0.697			
	WATER CONTENT Wo	21.3	21.2	21.3			
	DEGREE OF STURATION STO %	84.7	84.4	84.8			
p=1	KOITADIJORKOS TIME to win	20	25	25			
ESE	POST CONSOLIDATION HEIGHT ho cm	2.981	2.298	2.204			
M SOL Proc	POST CONSOLIDATION	0.578	0.488	0.473			
* C C							



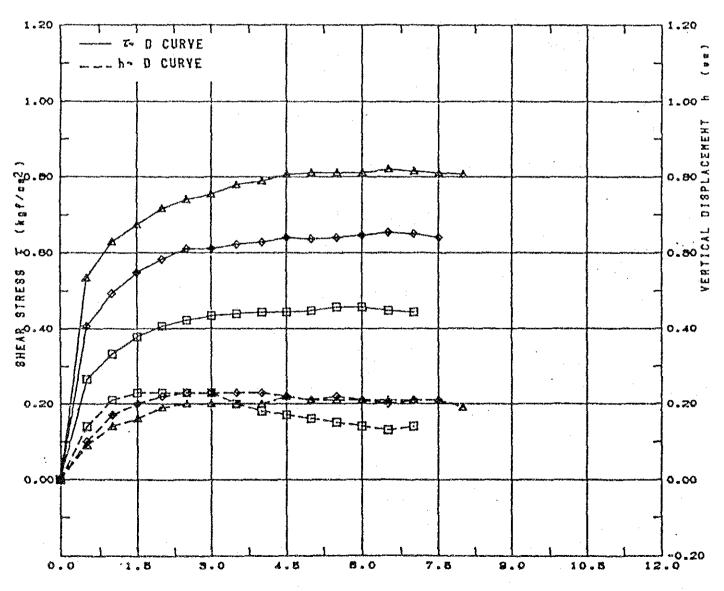
ELASPED TIME (min) D-134

	DIRECT SHEAR TEST	(CU)	(SHEAR	PROCESS)	FOR	REPORTING
NAME OF SURVI		yan dikemila nya kulumila na g	Production and Administration of the Control of the		regage and has for such as the such as follows:	DATE	1 23-	12-2594

SAMPLE NO AND DEPTH No A ATP 2

1.1m~ 4.0m

	CIMEN NO. TICAL LOAD Okof/cd	Na.1 🖾 8.51	No.2 ♦ 1.02	No.3 △ 1.53	No.	No.
RO	OM TEMPARETURE C	25.0	25.0	25.0		
	Te kgf/cm ²	0.458	1.654	0.821		
×	94	9.568	0.483	9.458	· .	
PEA	YERTICAL DISPLACEMENT H mm	0.15	0.28	₹.21		
**	HORIZONTAL DISPLACEMENT D ##	5.50	8.54	6.50		
	a, kgf/cs ²					



HORIZONTAL DISPLACEMENT D (mm)

	و در الاستخدام المعالم	DIRE	CT EAR TEST	(CU)	HORNAL 8	HEAR STR	ENGTH O	FOR	REPORTIN	6
AKE (F SURI	YEY J	LAM-DOM-	YAI						
8	LOCAL	ITY					nirr.	**************************************	~ 4 A A M	
MPIF	์ มก. เ	AND DE	PTH_No.c	CYDA		-	DATE		<u>3-12-253</u>	
			11020	O IP A				2.6%	~ 4.0m	i Lasap
	REHETH		· · · · · · · · · · · · · · · · · · ·	C(kgf/cg)	Ø DEGREE	tan Ø	Cits	ใ/เข้า	φ. DE E REE	
COPE Stres	S COMS	OLIDA	ED REGION	0.12	30.18	0.582				
•	CCKS	CLIDAT	ED RESION							
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1.80									-	-
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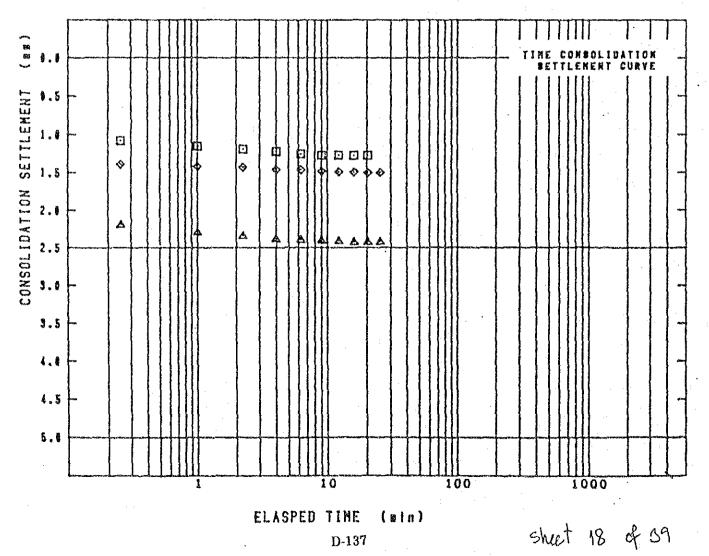
DIRECT SHEAR INITIAL CONDITION (CU) TEST FOR REPORTING LAM-DOM-YAI NAME OF SURVEY & LOCALITY DATE 129-12-2594

SAMPLE NO. & DEPTH No. C C TP2

2.6s 4.0s

E

	SPECINEN NO.	No.1 E	Ho.2 &	A E.ak	No.	No.
VER	TICAL LOAD To kgf/cm	0.51	1.02	1.53		
94	HEIGHT ho ca	2.54	2.54	2.54	·	
1110	DRY WEIGHT Va g	151.61	151.99	152.00		
0 %	SUBSTANCE HEIGHT he cm	1.818	1.822	1.823		
8t C	YOID RATIO ®o	0.997	0.984	0.394	·	
3-4 3-4 0-4	WATER CONTENT No.	19.8	13.5	19.6	7 7	
5X 	DEGREE OF STURATION STO %	80.8	81.0	81.2		
ion .	CONSOLIDATION TINE to min	20	25	25		
	POST CONSOLIDATION REIGHT ho co	2.413	2.990	2.288		
KBOL) PROC	POST CONSOLIDATION VIOD RATIO BD	0.927	0.912	0.281		
S S S						



ELASPED TIME (nim) D-137

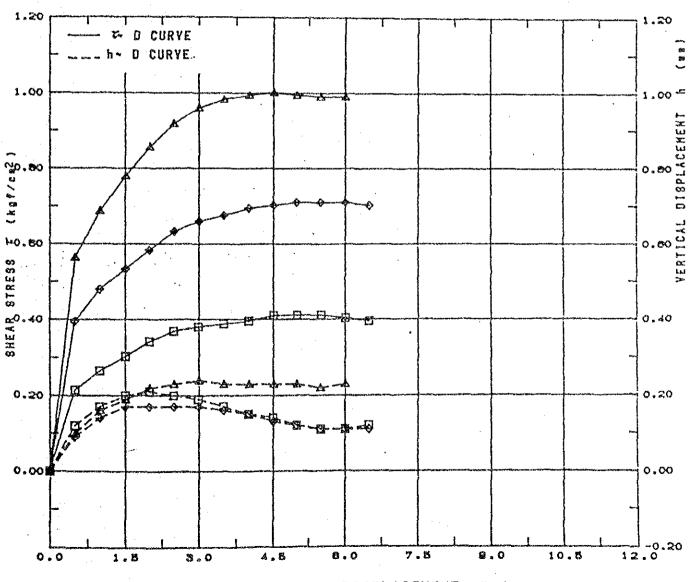
	DIRECT SHEAR TEST	(CU)	(SHEAR PROCESS) FOR REPO	RTING
NAME OF SUR & LOCAL	· · · · · · · · · · · · · · · · · · ·		and Palacinian and Assessment and Assessment and Assessment and Assessment and Assessment and Assessment and A			3-46-44 13 - 4-44 100-9

DATE: 23-12-2594

SAMPLE NO AND DEPTH No C CTP2

2.6n~ 4.0m

	ECIMEN NO. TICAL LOAD O kgg/cs	No.! ⊡ 0.51	No.2 ♦ 1.02	Ho.3 A	No.	No.
RO	DH TEMPARETURE C	25.0	25.0	25.9	MANUSCHIEGO AND DESCRIPTION (ASSESSMENT) (ASSESSMENT) (ASSESSMENT)	
	Ty kgf/cm2	0.411	0.718	1.402	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	
≥ €		0.320	6.308	0.248	A	
E)	VERTICAL DISPLACEMENT h mm	1.14	0.12	0.23		
* *	HORIZONTAL DISPLACEMENT D RE	4.50	4.99	4.51		
	dy kgf/cm ²	**************************************	Enderson, apply and the	State of the state	يون دون د دون په دو کان دون په دون دون دون دون دون دون دون دون دون دون	

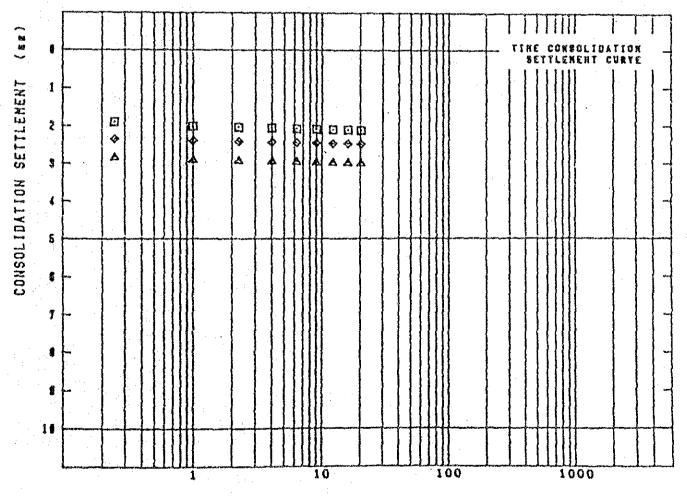


HORIZONTAL DISPLACEMENT D (BB)
D-138
Sheet 19 of 39

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	LOCAL							D	LTE:	23	3-12-253	 } 1
IHPL	E NO.	AND DEF	TH NO.	Ç C	TP4					1.23		
	STRENGT	I PARAN	ETER	i	(kg//ga)	Ø DESREE	ten	ø	Clkg1.	/cs ²)	φ' desree]
COPE	OF KOR	AL BOLIDAT	ED RESIO	Я	0.19	32.04	0.	626			-	7
	OYES	OLIDAT	ED RESIO	N								
,	ranana keemaanga aska			****	:		· .	***************************************				-,).S
2.40					•					CURVE	T PEAK). E(INIT.) E(CONS.)	0.5
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1.50	-4,				**************************************	. Comments the State of the Sta	· · · · · · · · · · · · · · · · · · ·	Δ.				0.3
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ð.	.0	0.9	0.8		0.9	1.2	1	.5	1.8		2.1	4

أورزورو والموارث والم	DIRECT SHEAR TEST	(CU)	INITIAL	FOR REPORTING
NAME OF SURVEY	LAH-DOH-YAI				Professional Annual Control of Co	and the same of th
& LOCALITY		-		and the same of th	DATE	129-12-2534
SAMPLE NO. & DEI	PTH No.C CTP4					1 5 t A

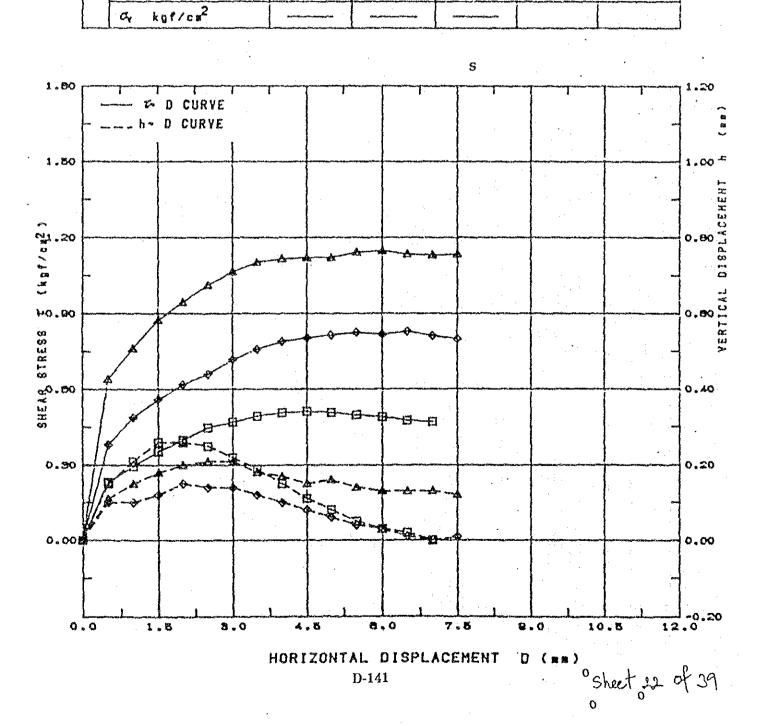
	SPECINEN NO.	No.1 13	Ho.2 &	A C.0K	Ho.	No.
VEF	RTICAL LOAD TR kgf/cs	0.51	1.02	1.53		The state of the s
775 623	HEIGHT ho as	2.54	2.54	2.54		
gerg gers gersp	DRY WEIGHT Wd g	152.39	152.07	151.92		-
CXC	BUBSTANCE HEISHT he ca	1.855	1.851	1.850		The state of the s
74	VOID RATIO	0.389	0.972	0.379		
\$ ·	WATER CONTENT Wo	12.4	12.8	12.7	Antonia o rivigo que en ri	
-	DEGREE OF SATURATION STO %	87.8	88.3	88.7		
**	CONSOLIDATION TIME to min	20	20	20		
	POST CONSOLIDATION HEIGHT be so	2.929	2.292	2.242		
FROC	ROITADIJOEKOS TEOG	0.256	0.298	0.212		
Ö					**************************************	



ELASPED TIME (min)
D-140

sheet in of og

DIRECT SH		CU)	(SHEAR PR	OCESS) FOR	REPORTIN
ANE OF SURVEY LAM-DO	M-YAI			DATE: 23-	12-2534
ANPLE NO AND DEPTH No.	C CTP4			1.23	- 4.0m
SPECIMEN NO. VERTICAL LOAD & kgf/car	No. EJ 8.51	No.2 ♦ 1.82	No.3 A 1.53	No.	l a l
ROOM TEMPARETURE C	25.0	25.0	25.4		
Ty kgf/cx2	8.511	1.829	1.110		
× Bi	0.249	8.237	0.205		
W VERTICAL DISPLACEMENT h em	0.11	1.01	9.13		
→ HORIZONTAL ✓ DINHADALISIO	4.50	6.58	6.00		



NAME OF		LAM-DOM-	YAI			and the second s			
	CALITY					DATE:	23	-12-25	34
SAMPLE N	O. AND DI	EPTH Ho, C	СТР6				1.1a	2.9	<u>a</u>
	XGTH PARA		C(kgf/cg2)	Ø DESREE	tan ϕ	Ctag	1/637	Ø'DESRE	E
SCOPE OF	HORMAL COHSOLIDA OYER	TED REGION	0.17	30.93	0.60	0		ر من	
	COHSOLIDA	TED REGICH					į		
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0.60									-
									
0.30									7
									4
0.0	0.3	0.6	0.9	1.2	1.5	 .i		2.1	

DIRECT SHEAR (CU) INITIAL CONDITION FOR REPORTING

NAME OF SURVEY LAM-DOM-YAI

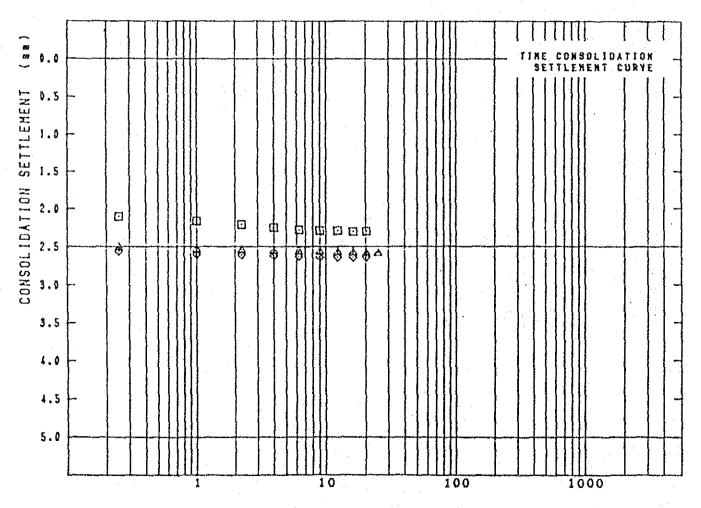
& LOCALITY

DATE:23-12-2534

SAMPLE NO. & DEPTH No.C CTP6

1.12- 2.92

	SPECINEN NO.	No.1 . ⊡	Na.2 \diamond	A E. of	No.	No.
YER	RTICAL LOAD TE kef/c#	0.51	1.02	1.59		
×	HEIGHT hocs	2.54	2.54	2.54	• ,	
1110	DRY YEIGHT We g	150.00	150.00	149.91		
(1) (2) (3) (4) (4)	SUBSTANCE HEIGHT ha ca	1.812	1.812	1.811		
	YOID RATIO .	0.402	0.402	0.402		
1-4 1-2 1-4	VATER CONTENT Vo	12.7	12.9	12.8		
æ.	DEGREE OF SATURATION Smu %	83.0	84.3	83.7		
	CONSOLIDATION TINE te min	20	20	25		
65 80 UJ	POST CONSOLIDATION HEIGHT ho cm	2.310	2.276	2.282		
PROC	POST CONSOLIDATION HEIGHT he cm POST CONSOLIDATION VIOD RATIO mc	0.275	0.256	0.260		_
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D-143

sheet 24 of 29

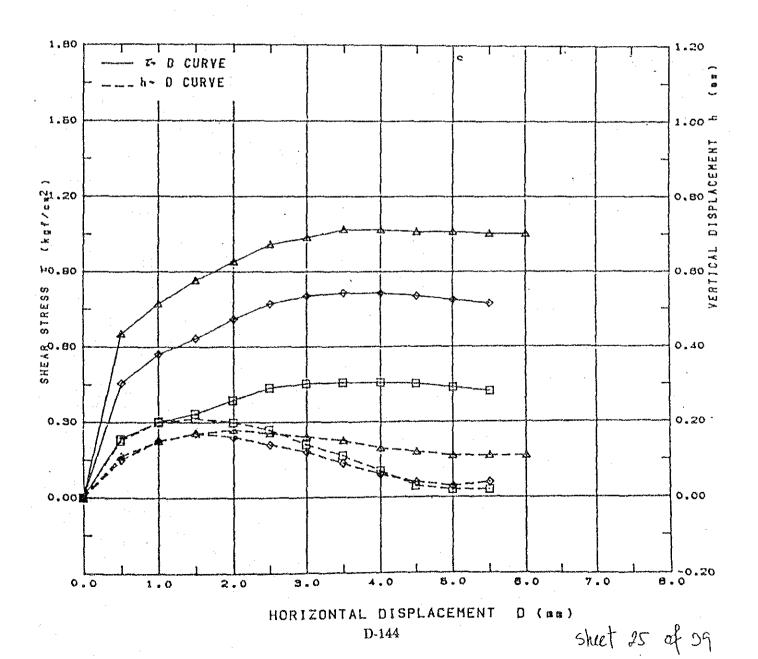
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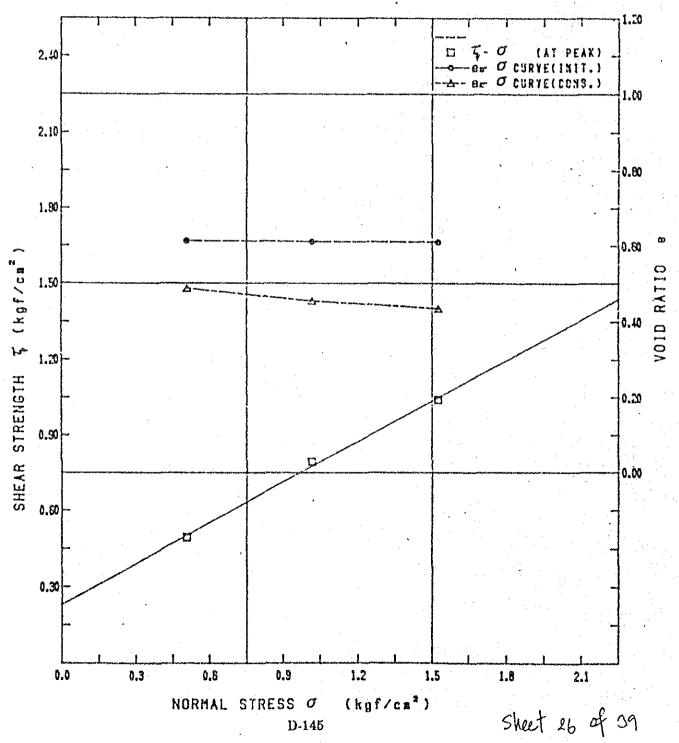
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	rf kgf/cm ²	0.457	0.314	1.058		
×	84	0.150	0.394	0.252		
PE/	VERTICAL DISPLACEMENT h **	0.11	0.09	0.15		
¥.	HORIZONTAL DISPLACEMENT D **	3.49	3.50	3.50		
	oy kgf/cm ²					

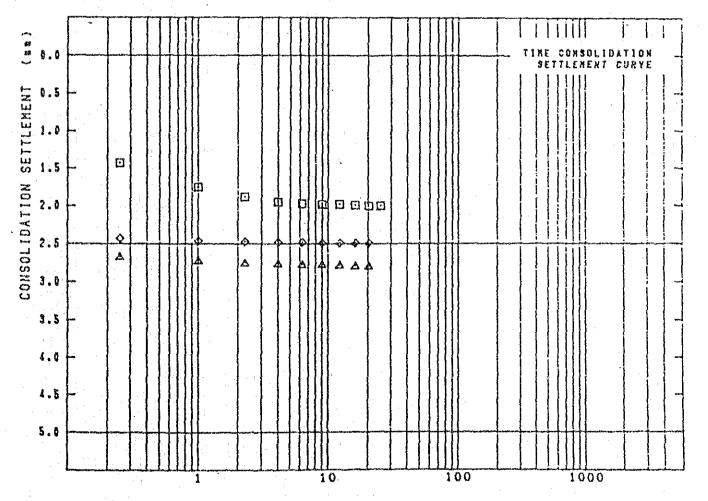


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		ф резнее 28.25	tan Ø 0.537	*************	



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& LOCALIT	T Y		DATE	123-12-2531
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1710	DRY WEIGHT We o	138.78	138.84	138.99		1
a x o a	SUBSTANCE HEIGHT he cs	1.574	1.577	1.577		
¥.E. C	VOID RATIO **	0.813	0.611	0.810]	
-	WATER CONTENT WE	18.2	18.2	18.1		
**	DEGREE OF SATURATION Sm X	82.1	82.3	81.9	1	İ
[]	CONSOLIDATION TIME to Bin	25	20	50		
ESS	POST CONSOLIDATION HEIGHT ha cm	2.340	2.291	2.281		
	POST CONSOLIDATION YIOD RATIO	0.486	0.453	0.434		
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D-146

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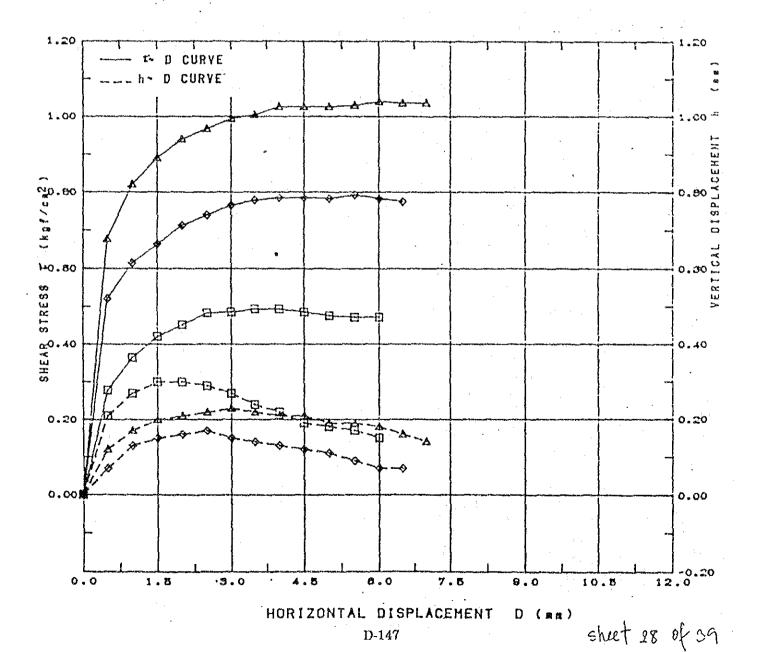
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HORIZONTAL DISPLACEMENT D BB

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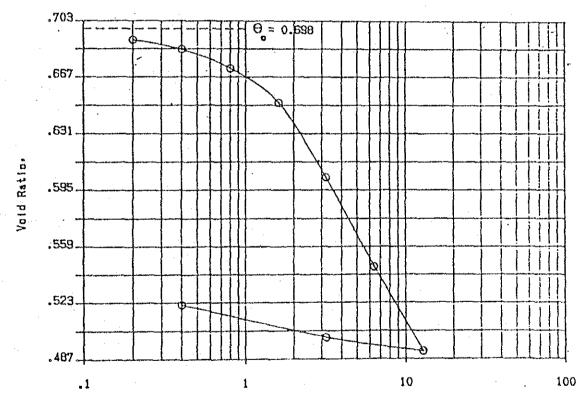


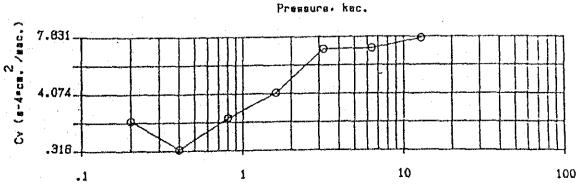
D-147

RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT L	AM-DOM-YAIA ATPX1.10	-4.00) MEHO	20/2535
HEIGHT(Initial)	2.00 cm.	HEIGHT(final)	1.79 ca.
MOISTURE CONTENT(In	tial) 21.20 X	MOISTURE CONTENT(final)	19.30 %
DRY DENSITY(Initial)	(1.637 gs./cc.	DRY DENSITY(final)	1.826 gs./cc.
VOID RATIO(Initial)	.698	YOID RATIO(final)	.522
DEGREE OF SATURATION	((initial) 84.44 %	DEGREE OF SATURATION(fin	al) 97.39 %

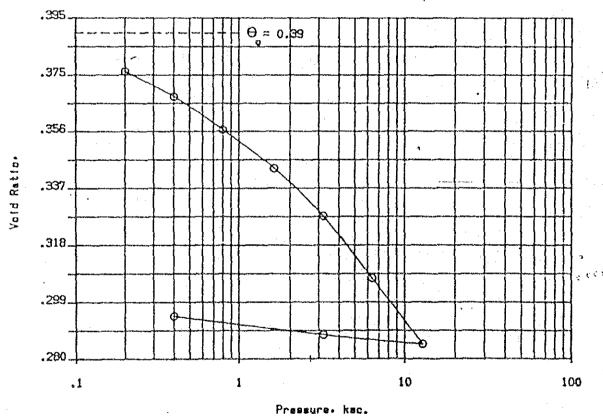


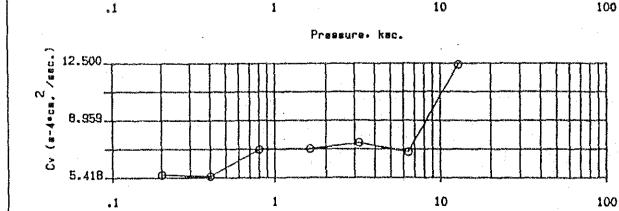


RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT	LAM-DON-YAL CCTP2(2.	60-4.00) HEHO	20/2535
HEIGHT(Initial)	2.00 св.	HEIGHT(final)	1.85 cm.
HOISTURE CONTENTI	initial) 13.20 %	HOISTURE CONTENT(final)	10.56 %
DRY DENSITY (Initi	al) 1.907 gm./cc.	DRY DENSITY(final)	2.048 ga./cc.
VOID RATIOCINILIA	1) .39	VOID RATIO(finel)	.294
DEGREE OF SATURAT	ION(initial) 89.69	X DEGREE OF SATURATION(fin	al) 95.2 %

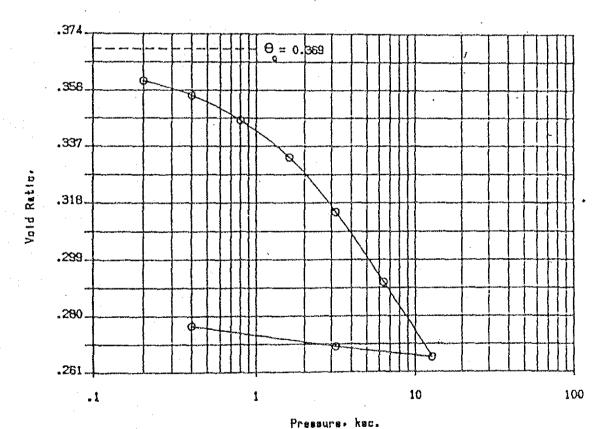


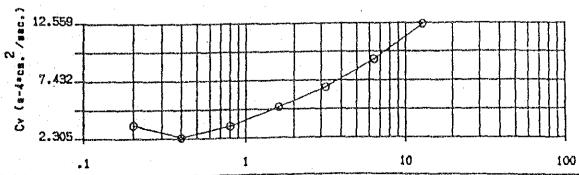


RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT	LAM-DOM-YAIC CTP41.20)-4.00) KENO	20/2535
HEIGHT(initial)	2.00 св.	HEIGHT(final)	1.87 cs.
MOISTURE CONTENT	initial) 12.36 X	HOISTURE CONTENT(final)	10.90 %
DRY DENSITY(Initi	al) 1.906 gm./cc.	DRY DENSITY(final)	2.044 gm./cc.
VOID RATIOCINIE	1)	VOID RATIO(final)	.277
DEGREE OF SATURAT	ION(Initial) 87.42 %	DEGREE OF SATURATION(fin	(al) 100 X

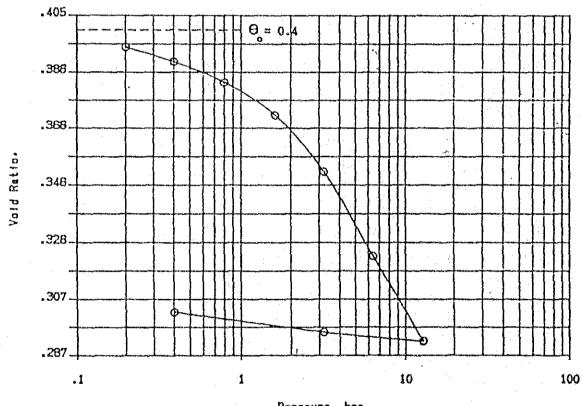


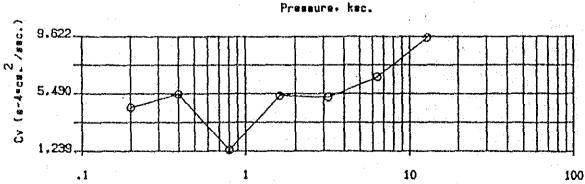


RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT	LAM-DOM-YAL. C CTP6(1.10	-2.90) HEMO	20/2535
HEISHT(Initial)	2.00 ca.	HEIGHT(final)	1.85 cm.
MOISTURE CONTENT	(initial) 12.58 %	MOISTURE CONTENT(final)	11.51 %
DRY DENSITY(Init	ial) 1.878 gm./cc.	DRY DENSITY(final)	2.02 gs./cc.
VOID RATIO(Initi	al) .401	VOID RATIO(final)	.302
DEGREE OF SATURA	TICN(Initial) 82.38 X	DEGREE OF SATURATION(fin	(al) 100 X

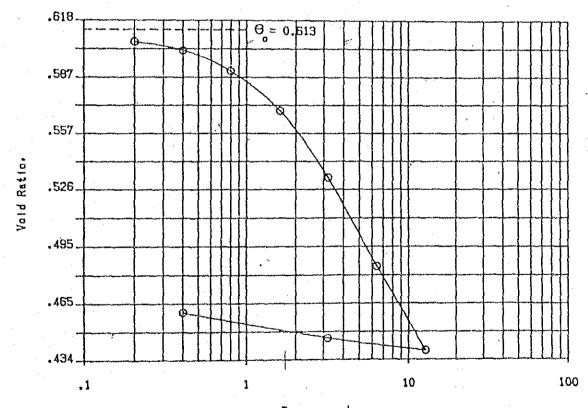


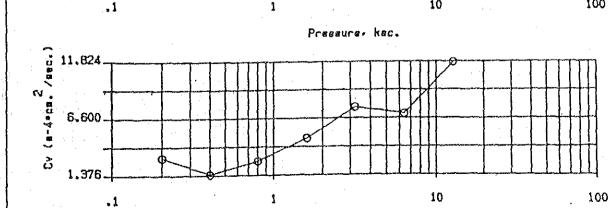


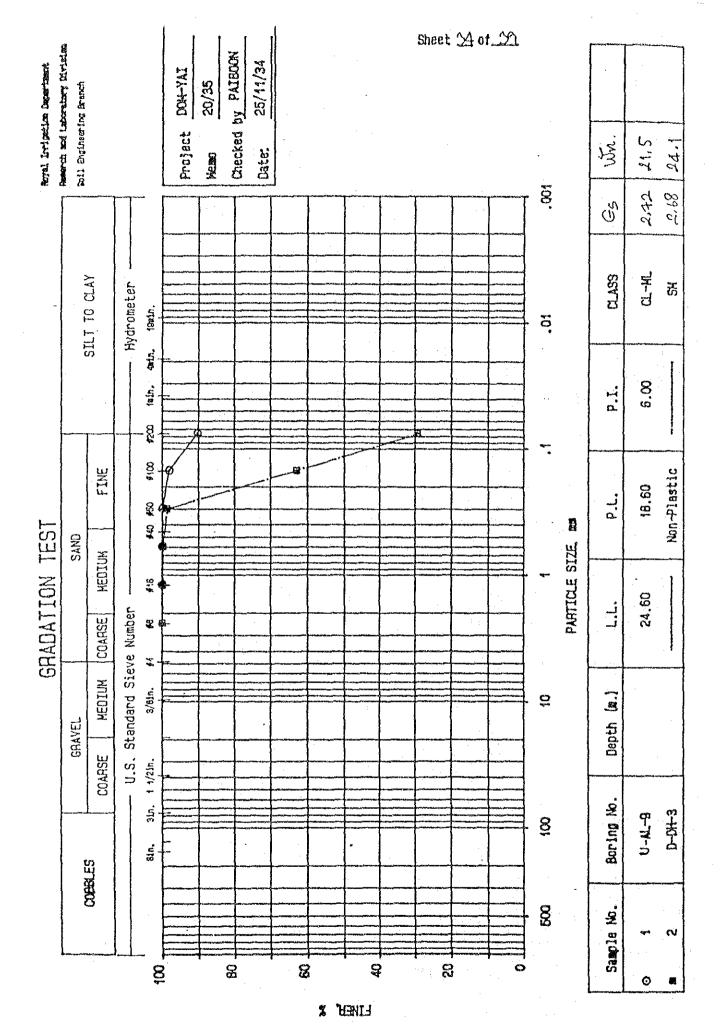
RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT LAM-DON-YAID DTP1(1.50-	4.00) MEMO	20/2535
HEIGHT(initial) 2.00 ca.	HEIGHT(final)	1.81 cs.
MOISTURE CONTENT(Initial) 18.22 %	MOISTURE CONTENT(final)	15.95 %
DRY DENSITY(initial) 1.711 pm./cc.	DRY DEHSITY(final)	1.891 gm./cc.
VOID RATIO(Initial) .613	VOID RATIO(final)	.46
DEGREE OF SATURATION (Initial) 82.03 %	DEGREE OF SATURATION(fin	mal) 95.79 %







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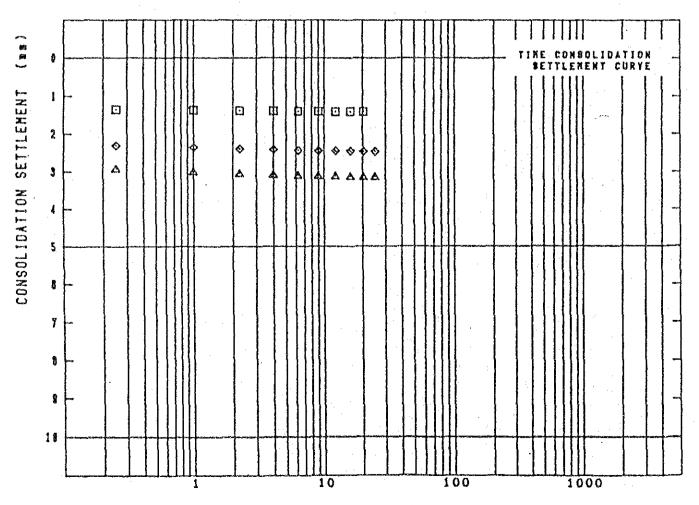
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· DATE 123-12-2534

SAMPLE NO. & DEPTH No. U-AL-9

1.28~ 1.98

	SPECIKEN NO.	No.1 🖸	No.2 &	No.3 A	No.	No.
YER	RTICAL LOAD To kgf/ce	0.51	1.02	1.53		
×	HEIGHT hocs	2.54	2.54	2.54		
ITIO	DRY WEIGHT Md 9	136.85	136.29	135.41		,
O X O	SUBSTANCE HEIGHT he ca	1.599	1.592	1.582		:
Ar. C	YOID RATIO es	0.589	0.595	0.606		
p-4 p-2 p-4	WATER CONTENT Vo	20.5	18.6	18.3		
*	DEGREE OF STURATION STURATION	94.7	89.8	88.9		
9	CONSOLIDATION TIME to min	20	25	25		
ESS	POST COMSOLIDATION HEIGHT ho ca	2.399	2.293	2.228		
180L) 780C	POST CONSOLIDATION HEIGHT ho ca POST CONSOLIDATION VIOD RATIO mo	0.501	0.440	0.407		
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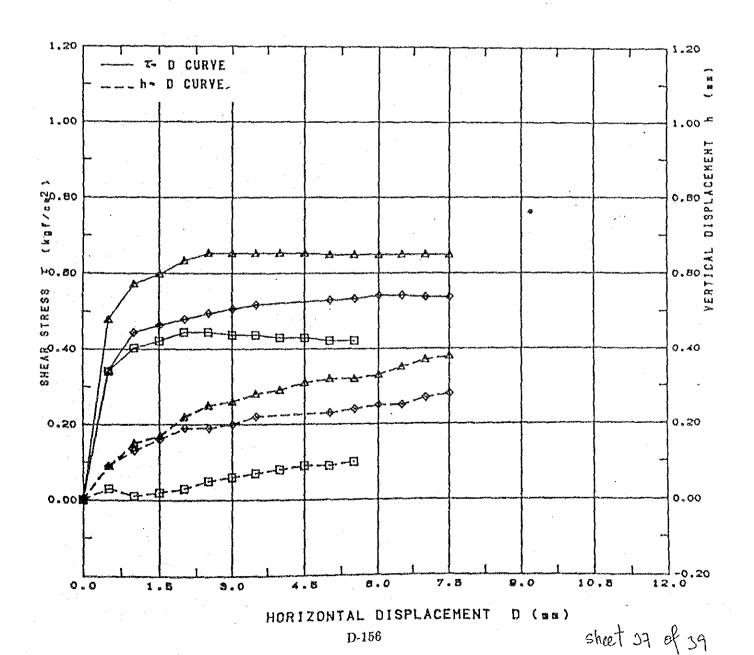
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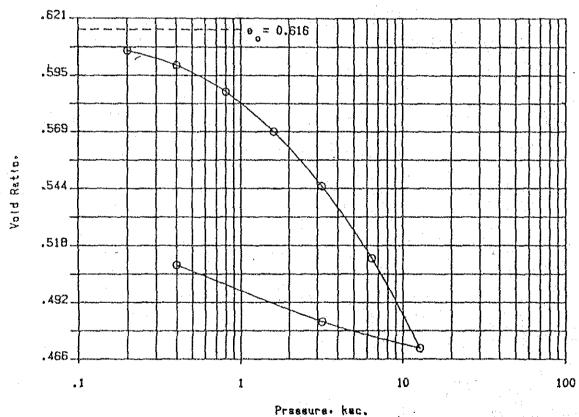
	ECIHEN NO. TICAL LOAD Økgf/ca	No.1 © 0.51	No.2 ♦ 1.02	No.3 A	No.	No.
RO	ON TEMPARETURE C	25.0	25.0	25.0		
	Ty kat/cs2	0.445	0.542	0.653		
×	86					
PEA	VERTICAL DISPLACEMENT h mm	0.03	0,25	1.25		
A.	HORIZONTAL DISPLACEMENT D &&	2.00	8,01	2.50		
	a, kgf/cx ²		Carrie College			

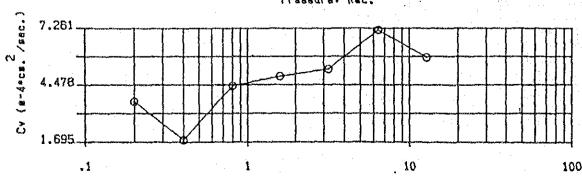


RESEARCH AND LABORATORY DIVISION

SOIL ENGINEERING BRANCH

PROJECT LAH	-DOM-YAIU-AL-9(1.20	0-1.90) HEHO	20/2535
HEIGHT(Initial)	2.00 ca.	HEIGHT(final)	1.87 ca.
MOISTURE CONTENT(In It	ial) 20.41 %	MOISTURE CONTENT(final)	18.32 %
DRY DENSITY(Initial)	1.603 ga./cc.	DRY DENSITY(final)	1.802 ga./cc.
YOID RATIO(Initial)	.616	VOID RATIO(finel)	.509
DEGREE OF SATURATION	initial) 90.12 %	DEGREE OF SATURATION(FIR	97.82 X





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			METHOD		INITIAL	TEST		14781.3	Š	
TEST NO.	SAMPLE NO	DE97H	COMPACTED	DRY DENSITY	WATER CONTENT	VOID RATIO	SATURATION	WATER CONTENT	group	YALUES OF PERMEABILITY .K
-	A ATP2	1.10-4.00	95% max	1.636	21.3	0.699	84.7	22.3	CL	1.869×10 ⁻⁸
2.	C CTP2	2.60-4.00	14	1.900.	13.6	0.395	91.2	14.8	SM-SC	5.419×10-8
3.	C CTP4.	1.20-4.00	=	1.899	12.8	0.374	89.3	14.9	SM-SC	4.898x10 ⁻⁸
4.	C CTP6	1.10-2.90	=	1.872	12.9	0.405	83.8	14.2	SC	1.399×10 ⁻⁷
5.	D DTPT	1.50-4.00 80	0g	1.710	18.3	0.614	82.3	19.8	CL .	7.520×10 ⁻⁸
6.	MUNR		. 1	1.620	l	1		25.1	SAND	4.024×10 ⁻²
7.	AL-9		UNDISTURBED	1.612	24.1	0.619	100.0	25.6	CL-ML	2.137×10 ⁻⁷
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ANNEX E. WATER RESOURCES PLANNING

ANNEX E. WATER RESOURCES PLANNING

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PART	r-I (OVER	ALL BA	ASIN STUDY)	
	CHAPTER	1,	WATER RESOURCES DEVELOPMENT PLAN BY SUB-BASINS	E-1
		1.1	Reservoir Plan in Lam Dom Yai Sub-Basin	E-1
		1.2	Reservoir Plan in Lam Som Sub-Basin	E-3
		1.3	Reservoir Plan in Huai Ari Sub-Basin	E-4
		1.4	Reservoir Plan in Huai Khao San Sub-Basin	E-4
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	CHAPTER	II,	WATER BALANCE STUDY AT POTENTIAL DAM SITE AND PROJECT FEATURES FOR POTENTIAL PROJECTS	E-6
•		2. 1	Water Balance Study at Potential Dam Site	E-6
		2. 2	Project Features for Potential Projects	E-6

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Table E-2	Project Features for Potential Projects	

PART-1 (OVERALL BASIN STUDY)

CHAPTER I. Water Resources Development Plan by Sub-basins

1.1 Reservoir Plan in Lam Dom Yai Sub-Basin

In Lam Dom Yai sub-basin, six smaller medium-scale reservoirs are planned on the tributaries at the mountainous upper-basin, D-7 reservoir on the main stream at the mountainous upper-basin and D-28 reservoir on large-scale on the main stream at the middle-basin.

Smaller Medium-Scale Reservoirs

The smaller medium-scale reservoirs are planned for tributaries that don't have reservoirs constructed on them or plan for construction by RID. The benefited areas are situated just downstream of the reservoirs, so gravity irrigation can be applied.

D-28 Large-Scale Reservoir

There are only two possible smaller medium-scale reservoir sites on both the banks at the middle and lower-basins of the Lam Dom Yai sub-basin. But, rainfed paddy fields of about 80,000 ha (500.0 thousand rai) are developed in this area. It is ideal to construct a large-scale reservoir at the site of D-28, so as to irrigate the above-stated agricultural land. On the site of D-28 with a direct catchment area of 767 sq.km, a river runoff of about 488 MCM can be expected by water amounts flowing over six medium scale-reservoirs at the mountainous upper-basin, and running off the direct catchment area.

There are such problems for the development, however, as compensation against agricultural lands and villages to be submerged in the reservoir area of D-28, and necessity of pumping up irrigation water 10 to 15 m high, because of the reservoir water level lower than the benefited area level.

Since the right bank area of D-28 reservoir is included in an

agricultural land reform project area conducted by ALRO, the agricultural land and villages to be submerged by dam construction will be able to resettle in this project area. The water pumped up from the reservoir can be irrigated by gravity through the canals being set along higher portions of the benefited area on both the banks. The construction cost of the canals will be comparatively low due to flat terrace topography. Accordingly, the development of large-scale reservoir of D-28 will be the center of the overall river basin water resources development.

D-7 and D-23 Large-Scale Reservoirs

D-7 site located at the mountainous upmost basin of the Lam Dom Yai main stream occupying a large catchment area of 262 sq.km, has abundant runoff discharge of about 104 MCM a year on an average. The dam-site forming a ravine, high dam construction will be capable of making a large reservoir with a storage capacity of about 100 MCM. This dam-site, however, bordering upon Cambodia and being under unstable public peace and order, and difficult of access, the construction works will also be unable to be implemented soon at present. it can be thought, however, that this dam-site is most advantageous for the further development after peace treaty with Cambodia.

Because there being no benefited area just downstream of the dam-site of D-7, the water stored by the reservoir will be directly released into the river, and be caught again by the above-mentioned dam-site of D-28. As a result, the available water in the reservoir of D-28 can be remarkably increaced owing to the regulation of the reservoir of D-7. This increased available water will be conveyed to the agricultural lands at the middle-basin of the Lam Som sub-basin and in Huai Khao San sub-basin, located on the left bank of the Lam Dom Yai.

If the reservoir of D-7 can not be realized for some reasons or other, the reservoir site of D-23 situated downstream, will be planned as the alternative large-scale reservoir site. Although D-23 site can develop as much irrigation water as the D-7 site, the dam construction cost would be high due to flat topography requiring considerably long dam length. Besides, there are a lot of compensation

problems due to submersion in the reservoir area. Consequently, D-7 site condition is much better than the D-23 site one, and so D-7 site was selected for the overall river basin development study.

1.2 Reservoir Plan in Lam Som Sub-Basin

The Lam Som sub-basin has a catchment area of 1,140 sq.km and large water resources amount of an annual mean run-off discharge of 463 MCM. There are two medium-scale reservoir construction plans in the upper-reaches of the sub-basin made by RID. In this study, ten smaller medium-scale reservoirs are newly planned. As a larger medium-scale reservoir, D-24 reservoir is planned too somewhat downstream of the middle-reaches.

Smaller Medium-Scale Reservoir

The smaller medium-scale reservoir can irrigate all the benefited areas just downstream of the reservoirs by gravity.

D-24 Larger Medium-Scale Reservoir

Because the topography of D-24 site is flat, a large reservoir with high dam and large storage capacity can not be expected. The runoff discharge in this site, however, reaching to 276 MCM in 1/5 probable drought year, therefore fairly large irrigable area can be developed. There are mostly forest and small paddy areas within the reservoir areas

The agricultural land along the Lam Som, just downstream of the reservoir of D-24 will be developed as the benefited area of the reservoir of D-28, the rainfed paddy fields, which stretch on both banks of the upper-basin of this reservoir will become the benefited area. According, the irrigation using the reservoir of D-24 will also be pumping irrigation.

There is high possibility that the D-24 site act as an intermediate reservoir, in case the available water developed by the said D-7 and sent through D-28 is conveyed to the agricultural land in Huai

Khao San sub-basin, because D-24 site located west of D-28 site, it nealy has the same elevation as that of D-28 site, and the irrigation water supply from D-7 to D-28 and to D-24 is easily obtained.

1.3 Reservoir Plan in Huai Ari Sub-Basin

The Huai Ari sub-basin consisting of quite flat topography, is occupied by large rainfed paddy field areas. As the water resources for this sub-basin, D-25 reservoir is planned.

The run-off discharge in a 1/5 probable drought year at this reservoir site is fairly abundant, amounting to about 89 MCM. Owing to good topography at the site, a medium-scale reservoir with a large storage capacity of about 20 MCM can be technically constructed. However the reservoir area, however, being occupied mostly by paddy fields, will be a problem on dam construction due to the land compensation.

The benefited area of this reservoir is not situated just downstream of the reservoir. Namely, since the agricultural land along the river just downstream of the reservoir of D-25 is planned to be benefited by the reservoir of D-28, the benefited area of D-25 must be rainfed farm land with a higher portion on the left bank of the Lam Dom Yai main stream in the lower-basin of the reservoir of D-28. Consequently, this irrigation, using the storage water, will be of a pumping irrigation system.

1.4 Reservoir Plan in Huai Khao San Sub-Basin

The Huai Khao San sub-basin is located in the westmost part of the Lam Dom Yai basin and is of flat topography occupied by rainfed paddy fields. Although five medium-scale reservoirs are planned at the upper-reaches of the sub-basin, the storage capacity is not enough to irrigate vast agricultural land stretching in the sub-basin. As stated above, therefore, the water developed in the reservoir of D-7 will be distributed to this area by way of D-28 and D-24. Also in this case, a pumping irrigation system from the reservoir of D-24 will be needed.