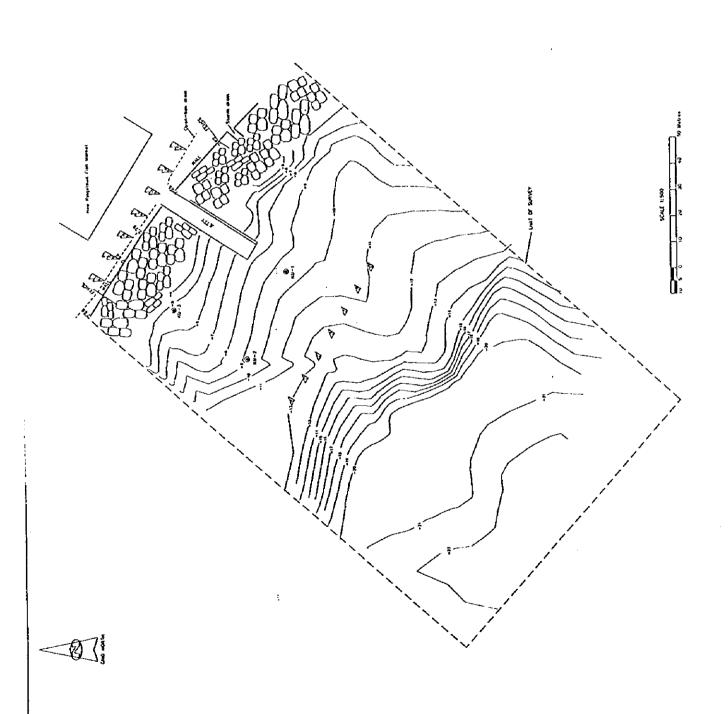
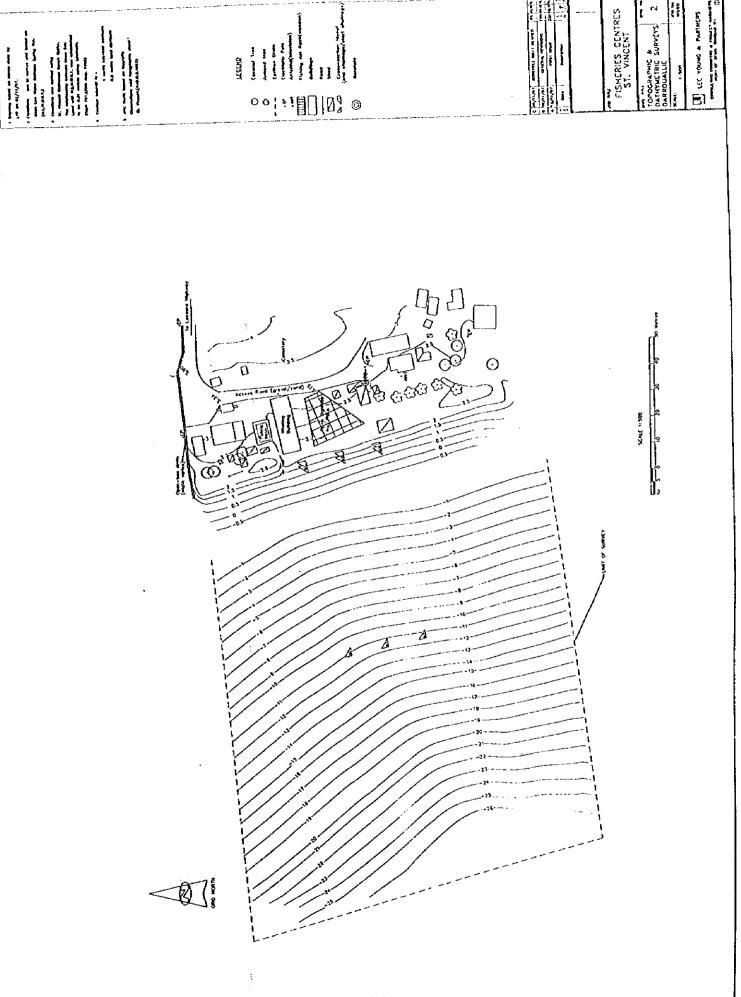
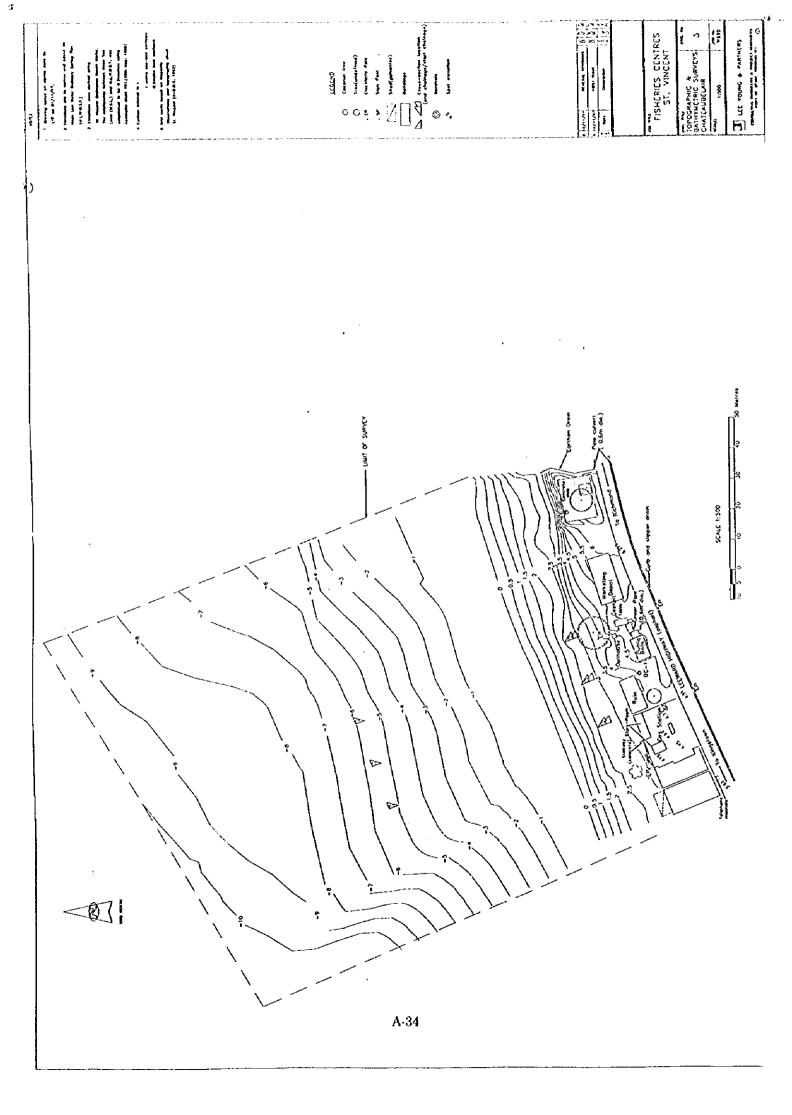
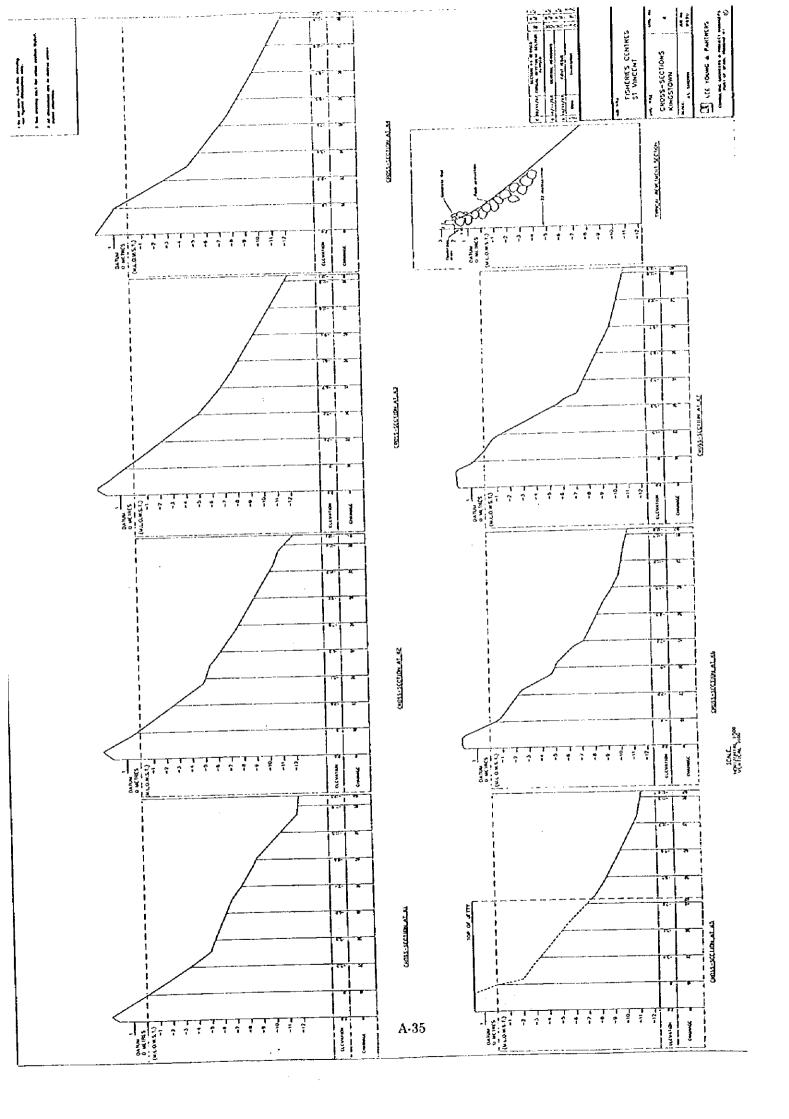
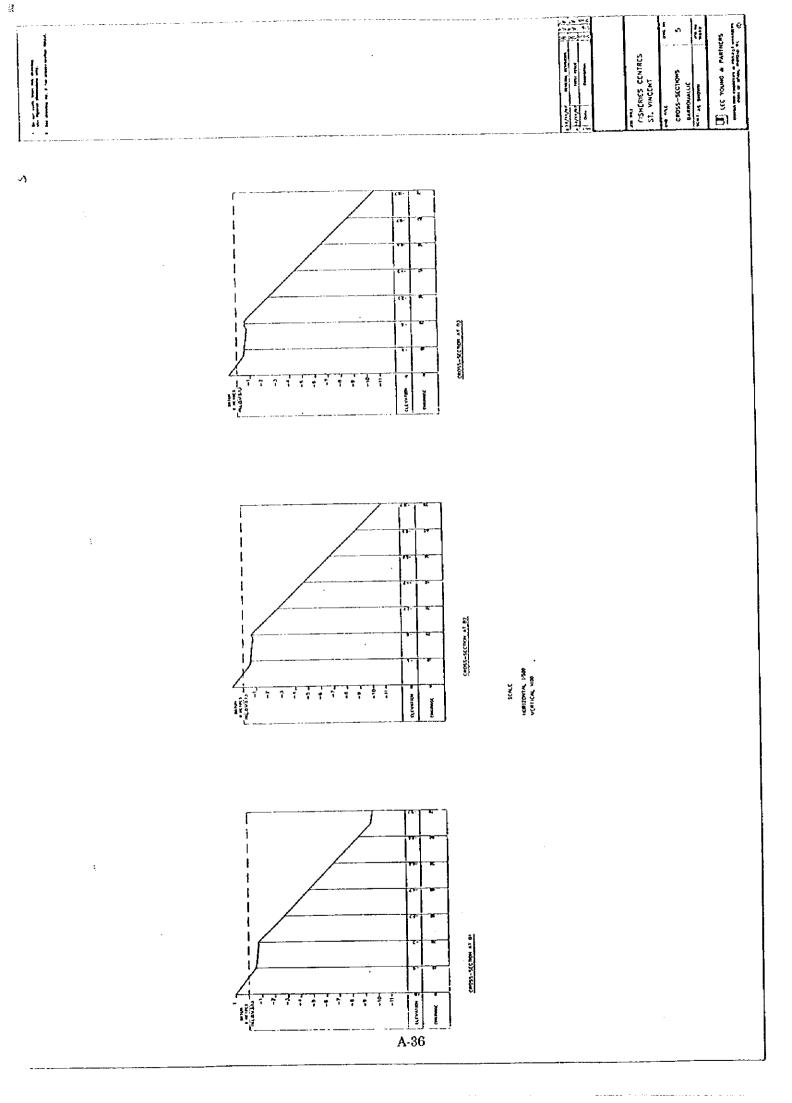
5. Result of Site Survey 5. Result of Site Survey 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1





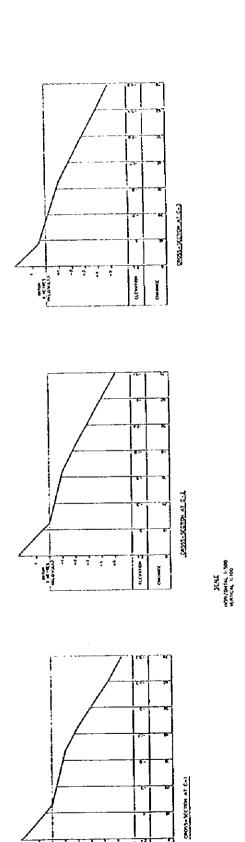






to a complete and the complete was a second to the complete and the comple	TISHCRIS CENTRES TISHCRIS CEN	2 2
ļ · ·		

Ø



A-37

LEE YOUNG &	PARTNERS - GEOTECHNICA	L DEPARTMENT
JOB NO. W 690	BOREHOLE TEST RECORD	SHEET OF
PROJECT Fisheries - Kingstown	DATE STARTED 18:11 97	LOCATION St. Vincent
TYPE BORING	DATE COMPLETED 16. 11. 97	GROUND ELEVATION
SOIL PROFILE SOIL PROFILE DESCRIPTION	SHEAR STRENGTH KN/m²	000 COU- 1ESTONAL 1ESTONAL 1ESTONAL 1ESTONAL 1ESTONAL
\$ DESCRIPTION	SHEAR SHENGIN KN/m² WATER CONTENT 3 SID. PENETRATION TEST- N-VALUE(REOW/300mm)	11111111111111111111111111111111111111
DCPTH NGRAPH NGR	WATER CONTENT 3 STD. PENETRATION TEST- N-VALUE(eLOW/300mm) Co (LV/m²) & s Co (LV/m²) & s TO 20 S0 40 50 60 70 60 90 100	LIGUID UMIT PLASTICITY INDEX CONSOLIDATION TEST HYDROWETRES TEST SIEVE (W & D) LINCONFINED COM- DINCONFINED COM- POCKET PEN POCKET PEN POCKET PEN SHEAR VAME (WN/m²)
SINTIGRAPHIC POLY SOLUTION SOLUTION SOLUTION X SOLUTION	1 1 20 30 40 50 60 70 60 90 16	LICUID UMIT PLASTICITY INOC. CONSOLIDATION HYDROMETRES TI SIEVE (W & D) CU (MM/m 2) CU (MM
9 SP. SMO AI Poorly graded		
10 - Sand with	4 8 212	24
	6 4 9 1 1 1 1 1 1 1 1 1	+
n = 1	9 4 4	
<u>-</u>	29 21.1	7
3	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
14-114		
155		3
16 Sand 20 30 Silty Sand	5 25 A 2	
1 4 1 1 7 1 1 1		
18		
7	10 4 0 1 1 1 1	1
~ X 6 -		28
12 83 Pour ly grade	[6] 33 py. (1)	.
525m 12 88 Pourly graded Sand with		
23-1210	 	
		32
SOIL CLASSIFICATION AS PER ASTM D 2 WATER DEPTH HOURS AFTER		DRILLER WATER ENCOUNTERED
LECENO CRAVEL	SET SET STATES	SCHIST
PANO SENO	CLAY PEAT	CELLETT CINESTONE SHALE
STANDATO SPLIT SPOON WE UNDISTURBED (SHE.BY)	PCASTIC ETOUTO, FOULT THAT THE TOUTON ATTENDED TO THE TOUTON THE T	▼ POCKET PENETROWETER ■ UNCONTINED COMPRESSION TEST
CONDISIONSES (NO RECOVERY)	5 % YALVE (50 C)	Ð FRANKA, 1881 ▲ MANE SHEAR 1881 Û 1. JAN HÖ
Maria Augusta	Confer of threing to court in the Section	र्च (१८ १५५ चर्च) चै (१८ १५५५ चर्च)

LEE YOUNG &	PARTNERS - GEOTECHNICAL DEPARTMEN BOREHOLE TEST RECORD	II
JOB NO. W 690	BORING No SHEET OF	F
PROJECT Fisheries - Kungstonen	DATE STARTED 18 · 11 · 97 LOCATION St. V	Timent
TYPE BORING	DATE COMPLETED 26 11 97 GROUND ELEVAT	TION
	SHEAR STRENGTH KN/m² WATER CONTENT. 2	TRIANTAL TESTAMA" (4N/m²)
SOIL PROFILE BESCRIPTION	WATER CONTENT A STORY OF THE ST	GU (NY/M ²) GU (NY/M ²) GU (NY/M ²) FINANA JUGONTNED OU JUGONTNED OU JUGONTNED SHEAR VANE (NY/M ²)
S S S S S S S S S S S S S S S S S S S	CO (FX/Wg) 8 \$ CO UMATTY CO CONTRACTOR CONTRACTOR CO CONTRACTOR CONT	/m ² SEES SONTH
SS STATE STA	SENTENCIONES CONTENTE STATE CONTENT STATE CONTENT STATE CONTENT STATE STATE CONTENT STATE STATE CONTENT STATE STATE CONTENT STATE ST	CO (MY/m ²) O DEGREES O DISCONTINE POCKET PEN SHEAN VANE
		64
	138	
h2-1 "		-
12 - X12 1 MIH 71 29 Sundy Clastic	11 36 22-1	50
21- X12 MIH 71 29 Sundy Clashi Silt with Grand		
17-1 grand		1 4
	9	
1311		╁╾┼╍┼╌╂╌┽╌┤
3		
1 3 1 1 1 1 1		
' 3		
	┤╏╏ ╏┇┩╇╬╬╬┼┼ ┼┼┼┼┼┼┼┼┼	
	┡╃┩┈╬╬╬	
	┠┤╌┼┈┼┼╂ ┼┇┊┊┆╣╏╎ ╿┈┼┼╏╏ ╅	
SOIL CLASSIFICATION AS PER ASTM D		
WATER DEPTH HOURS AFTER	UNCEMENTED	NCOUNTEREO
CRAVEL CRAVEL	CALCASEOUS ETTERAN	SCHIST FILED HARD
ONAS GROUPD SCAN	PLASTIC LIQUID Y FOCKET PEN	UEUE SHALE
STANDARD SPUT SPOON SEE UNDISTURBED (SPECBY)	CIMIT LIMIT WACONFINED	COMPRESSION TEST
UNDISTURBED (NO PECOVERY)	A M MARIE (S.D.E.) A MANY SHEAR	י ובצו
AND AND ASSESSMENT OF THE PROPERTY OF THE PROP	Contemporary receives to construct Q II (45 Am)	ned Compression Frie Will

į		
LEÆ YOUNG &	PARTNERS - GEOTECHNIC	AL DEPARTMENT
1 00 m. KI690	BOREHOLE TEST RECORD BORING No. 2	SHEET OF
DOB NO. W690 PROJECT Fisheries Kingstown	DATE STAPTED 18/11/97	SHEET OF LOCATION G. Vivicent
TYPE BORING	DATE COMPLETED 26/11/97	GROUND ELEVATION
SOIL PROFILE DESCRIPTION	SHEAR STRENGTH KN/O	0CX 0CX N 1CS1 1 TEST 1 TEST 1 CS COM- 1 CS TOWN?
0ESCRIPTION	WATER CONTENT 3 STO. PENETRATION TEST N-VALUE(BLOW/300mm)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DEPTH DEPTH NUMBER NUMBER NUMBER SATICATION SSOIL SSEICATION SSAND	MATER CONTENT A SID. PENETRATION TEST N-VALUE(BLOW/3000mm) Cu (W/m²) & • Cu (W/m²) & • TO 20 30 40 50 60 70 60 50	LICUID LIMIT PLASTICITY INDEX CONSOLIDATION TEST SEVE (W & O) SU (KN/M 2) TRIANAL O DECREES POCKET PEN SIEAR VANE (KN/M 2)
DEPTH TYPE SY NUMBER SIGNIGHAPHIC PLOT SOUL CLASSFICATION Z FINES Z SAND Z SAND COMMENT COMMENT Z SAND COMMENT	10 20 30 40 50 60 70 E SO 10 E	LIOUID LIMIT PLASTICITY INDEX CONSOLIDATION TEST HYDROMETRES TEST SEVE (W & D) CU (XN/m²) TRIAXAL
Sea eco		
	4 27.1	24
Roothy graded Sand with		
11 = X 2 552-544 11 87 Selt	4 9 4	++
	4 6 1	
	ζ 4 Φ	
19 -2 471		
(S-1)	1 2 2	
Sand with sitt	¹ 8 32 52 4 PΛ	
		1
17		
8-1/1,	10 1 14 16 1 1 1	
4 = 1		
		<u> </u>
25 14 Silty Soul	718 20-4	
		1.1.
	25	36
3		46
SOIL CLASSIFICATION AS PER ASTM D 2	2487-93 100 200 300 400 6	500 ORILLER
WATER DEPTH HOURS AFTER	UNCELENTE	
CRANSI SANO SANO	CALCAREOU MATTER	CENTED WAS AND
S 51400470 SOUT 50004	2:450: 00:0	Y POCKET PENETRONETER
UNDISTURBED (SHELBY)	राजा राजा	■ UNCONFINED COMPRESSION TEST
UNDISTURBED (NO PECOVERY)	NATURAL WATER CONTENT W	नी विश्वसम्बद्ध ग्रह्मा अ. अवस्त्र इस्तरका ग्रह्म

•	BOREHOL	E TEST RECORD	DEPARTMENT
108 No. W 690:	BORING No.	2	SHEETOF
DOB NO. W690.	DATE STARTE	0 18/11/97	LOCATIONST. Vincent
TYPE BORING	DATE COMPLE	26/11/97	GROUND ELEVATION
및 SOIL PROFILE		SHEAR SIRENCIH KN/m² YAUR CONIFHI Z	05X N TCST 1 TEST 1) D COW- TESTANA (NY/M-2)
DESCRIPTION	7. Ømm) ¥7.	STO. PENETRATION TEST- N-VALUE(BLOW/300mm) Cu (KN/m ²) & 9	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DEPTH NUMBER SANDER PLOT SOIL CLASSIFICATION Z FINES Z SAND Z SAN	S.P.T. VALUE. (BLOWS/300mm) AOSTURE CONTINT (2) BULK UNIT WT.	Cu (kN/m²) & #	LIOUID LIMIT PLASTIC LIMIT PLASTICITY INDEX CONSOLIDATION TEST HYDROMETRES TEST SIEVE (W. & D) CU. (MN/m.².) RINXIAL
NUMBE SIGNITION SOL LASSIFICA Z SAND Z SAND	S.P.1 NOS CONT FRANK	10 20 30 40 50 60 70 80 50 100 1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
1 3 1 2 1			46
	54		
	(50) 47.2	111191114	
35 (5 Silly Sand	100 4.7		
[,]			
			
28			
<u> </u>			
			-
∞ -			
			
4			
! =			
1 - 3 1 1 1 1			
		┠╫╫╫	 -
		╂╬╂╬┆┊╏┊╏┼	
3		┠╁┼┼	
SOIL CLASSIFICATION AS PER ASTN D		100 200 300 400 500	DRILLER
WATER DEPTH HOURS AFTER		POCKET PEN (KN/m²) & OU UNCEMENTED	WATER ENCOUNTERED
CRANEL SANO	SA. I	CACARCOUS NAMER	
60000	PLASOC	0000	A SOCIL SECTIONITE
\$1400490 SOUT \$200H	tru: i	MATER CONTENT W	■ UNCONFINED COMPRESSION TEST © TRIATER TEST
UNDISTURBED (NO PECOVERT)	A N VA	SE (SEE E) Se oute manifestation	A HANG SHEAR FEST OF CLUMNING
- 「 ス リー・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	A AND THE	v • ·	A STATE OF THE STA

BOREHOLE TEST RECORD BORING No. 3 SHEET 1 OF 2	ĺ
, 000 No	ļ
PROJECT Estrais Line Kingston DATE STARTED 18-11-97 LOCATION St. Vincent.	
TYPE BORING DATE COMPLETED 25:11.97 GROUND ELEVATION	
SOIL PROFILE SUSAB SERSOCIU VI (m2	() #5
SOIL PROFILE SHEAR SIRENGIN KN/m² VALUE CONTENT STO. PERCENTION TEST. STO. PERCENTION T	3
SAND SINGLY MET WALLE CALLED CONTROLL MATERIAL M	מילאט אאנב (או/m²)
	אַכעו
5-1	
3 23.1 4 6 1 1 22	-
8. 1X 3 52-94 12 28 Poorts prophed 9 142 1X	
Sound win	
-X 4	
	İ
- X 5 - - - - - - - - - - -	
5 4 9	
15-X 1 S4 20 80 Schusond 7 249 24-4	
	-
10 SM 23 11 Siling I was 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11 20.3 39.5 1 1 29	
3	:]
WATER DEPTH HOURS AFTER DRILLING POCKET PEN (KN/m²) & OU WATER ENCOUNTERED.	
CRAVEL SELT SELT SUNCENENCE COAN SCH	\$1
WADE UPOUND SEND SEND CLAT PEAT SELECTIONS SHA) . .
STANDARD SPUT SPOON PLASTIC LIQUID Y POCKET PENETRONETER	5!
UNDISTURBED (SHELBY) X HATURAL WATER CONTENT → TRIADIAL TEST A MANUE SHEAR TEST	
□ □ □ April Property	· · · · · · · · ·
A-42	*;

						(
					<u>L</u> 8	Æ.	YOUNG &	PAF	NTS	ER	- GEOTECHNICA	L DEPARTMENT
				1.3.4	· ar	,	•				E TEST RECORD 3	SHEET 2 OF 2
							 K-tingsom				0 18.11.97	LOCATION 5 Descrit
											ETEO 26.11.47	
IY			KIN	G			PROFILE			OMF C		3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	0.101.0		0	DESCRIPTION & WAITE CONTENT 5							1 MOEX MOEX MON TEST (0) TESTONAL TESTONAL TESTONAL ((N/m²))	
¥1.430		ນ	RAPH	Ş				/200/	7. (Z)	W. TINC	EN-ATTR(GFOM/20044)	C C UMITE (W. A.C.) AMETINE (W. A.C.) T PEN VAVE
ľ	me	NUM	SIRATIGRAPHIC PLOT	SOPL ELASSIPICATION	# FINES	SANO		P. 7.	1989 日本の	XX SCX		PLASTIC LIMIT PLASTICITY INDEX CONSOLIDATION TEST WYOROMETRES TEST SEVE (W. A. D.) CU (KN/M.2.) TRIAMALL © DECREES ON UNCONFINED COM- POCKET PEN POCKET PEN SHEAR VAME (KN/M.2.)
-	=	!	S.	; <u>_</u> _	14;	ĸ		100	20		10 20 30 40 50 60 30 60 50 100	510 2 2 2 2 3 3 3 3
20-	$\frac{1}{2}$	11						17		<u> </u>		33
	}										┤┤ ┦ ┤┤┤┤┼┼	
21-	₹							一				
22-	<u>}``</u>	-		54	22	78	subj sand	32	17.3	24.4		39
,,	1							87				
23-	*	13							Ī			
24	1					Ì						
35	<u>¥</u>]14		İ				57		<u> </u>		
	=	ŀ					<u> </u>					
26	-	15	<u>;</u>	su.	37	65	tille sand	51		2.دنا		
27.	_				1		-			<u> </u>		
	=											-
	7								╁╴	 		
	4							ļ	<u> </u>			
	=											
ı	=							T	T	1		
	4		-					-	<u> </u>	╀		
	7									1		
	-						-	-	<u> </u>	-	╀╫┾┼╏┇┇┊┞╢	
	=											
Ì	3							,				
					TIO	A N	S PER ASTM 0 2			1.	100 200 300 400 50 POCIET PEN (NN/m2) & Ou	ORILLER
	LEC			PIH		· · · · ·	HOURS AFTER	ر عا اعترال		Sal	THE CALCAROUS	CC-7)
	852	88	8	ರ್ಥ ಭ≓ರ	∪×0	Ĺ	SANO			CLAT	USSIS CALCAGOS	SCHIST COAV SCHIST HARD COCCUTO UVESTONE SHALE
<u>i</u> -		2723	ы ——-			5200			,2, 1	s ric	<u> </u>	A SOCYEL SEVELYONE LEW
				(199£)						A FURA	CILLIT TO WATER CONTENT, W	■ UNCONFINED COMPRESSION TEST © TRIADIAL TEST
!		_	وين. دونت	tuR8f]	(*-:	P(C)	S√(91)				est (\$P\$) Estatement (estate	A MANE SHEAR FEST O IN GANGARY
79 F									V.,			i di di manganan kalang di kacampanan di mangan di kacampanan di mangan di kacampanan di mangan di kacampanan Manganan di kacampanan di mangan di kacampanan di kacampanan di kacampanan di kacampanan di kacampanan di kaca

LEE YOUNG &	PARTNER:	S - GEOTECHNICAL LE TEST RECORD	DEPARTME	NI
JOB NO. KI 690	BORING No.		SHEET	
PROJECT Fisheris - Carronailles	DATE START	ED 18 · 9 · 97	LOCATION	
	DATE COMPL	ETEO. 26 · 9 · 97	GROUND ELEVA	
SOIL PROFILE OESCRIPTION		SHEAR STRENGTH KN/m² WATER CONTENT 3	PLASTICT LIMIT PLASTICTY INDEX CONSOLDATION TEST HYDROMETRES TEST	SICYC (W & D) V (MV/m²) RILAMAL S DECREES PROCEED COM- PROCESSION TESTEMM POCKET PEN SHEAR VANE (WW/m²)
DEPTH TOPE SIRATICRAPHIC SUL ZASSPICATION Z FINES Z SAND	S.P.T. VALUE- (BLOWS/SOOmm) MOSTURE CONTENT (2) BULK UNIT WT. KN/m.	STO, PENETRATION TEST: N=VALUE(BLOW/300mm) Cu (kN/m²) & #	DOUG UMIT PLASTICITY INDEX CONSOLIDATION TI RYDROMETRICS TE	(M/m²) (M/m²) (M/m²) (M/m²) (M/m²) (M/m²) (M/m²) (M/m²)
DCPTH TYPE NUMBER SIRATICRAFMU PLOT SOUL CLASSFICATION Z FINES Z SAND	S.P.T. VAL (BLOWS/36 MOISTURE CONTENT (BULK UNIT		PLASTIC LIMIT PLASTICITY IN PLASTICITY IN CONSOUDATION	SIEVE (W. A. D. Cu. (MM/m ²) B DEGREES MUCONFINE POCKET PEN SHEAR VANE
32 8 8	126 33 93	19 20 30 40 50 60 70 65 90 100 11	<u> </u>	5 - 3 E &
				24
2 1 97 1 99 Poorly graded	4 10 314	AKP IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	_	
12 3 Sand	1 100			
3 - 12	18			33
4				
	23			35
5 1				
5X4 Seems 92 Poorly	26 16 271			
7- Grand	27.1			36
7- Sr. Sn. 7 93 Poorly Found with	35		.	40
8 =				
q - 1	2027			
	2027			34
	22		_	36
				
	¹⁵ 20 m			
Sw-swill 89 Well graded sand with	25 20 21			#
3 SUF	47	- - - - - - - - - - - - - - - - - - -		
		<u> </u>		40
\(\frac{1}{2}\)		+++1/6 ; []		
-3	34			
SOIL CLASSIFICATION AS PER ASTM 0 2 WATER DEPTH HOURS AFTER		100 200 300 400 500 POCLET PEN (LN/m 2) 4 OU	ORILLER WATER 6	NCOUNTERED
GRAVEL	Sr. r	UNCEMENTED CALCAREOUS	(34V	SCHIS!
MADE CROWNO SANO	CAT CLAS	2EAT	EEEEEvestone	#4.20 \$Hete
STANDARD SPLIT SPOON SEE UNDSTITERED (SEE, SY)	PLASTIC CIVIT NATURAL	UOUD LIBIT		KETROWETER DICOMPRESSION TEST TST
United Studies (No invidendad)		DS (\$P.F.)	A MANE 5-64	a rest
C P C P C P C P C P C P C P C P C P C P	ు శిశ్చిత్వారి చారులు	t national decreek to a proper varieties	4	r red series

			_,,,,	l.E	Æ	YOUNG &	<u>PAf</u> BC	2 <u>11</u> 2RE	NERS HO	S .E	TE	GE S1	Ō.	TE(RE	CH CO	NIO RI	<u>CAI</u>)		DE	<u>P</u> <u>A</u>	(R)	M	E	11					
908	No.	_							No.										SH	εετ			_, (OF.					
PRO	EC.	۲					DAI	ε 5	START	Ε0 _			•						LO	CAT	NO								
TYPE	8	ORIN	G			·	DA1	EC	OMPL	ETEC	>						·		GR	100	10	EU	EVA	TIC	. ИС	Y			
	SAIPLE			S	OIL	PROFILE					;	SHEA	3_5	JESA JUG	GIH.	.KM.	m²				×	1057	5		TRIANGAL		STORY		ν/m ²
┰┼	<u>₹</u> _	Ž,	- Z-		DES	CRIPTION	- 4	§	}		:	5 TO.	የይነ	(9LC	ላከርሶ	i TE	sr.		-); 	ğ.	NOU	532	좡	<u>~</u> [57	95.59 35.93	: გ	7))?r
HE d30	ğ	11CRA	HCAN	ប្រ	SAND		* < \ X	MOISTURE	מערא טאוד אל. הא/ש		•	Cu (esy.	m 4)	& *				רושח מוחסיו	PLASTIC UNIT	PLASTICITY INDEX	SOLIO	HYDRCMETRES 1		Cu (4N/m2.)	DECREES	ON DRESSION TESTOWN	POCKET PEN	SHEAR VANC (KN/m²)
}	- ₹	STRATICRAPHIC PLOT	SOIL CLASSIFICATION	Z FINES	γς 2.		9.0	ŠŠ	33	16	2υ :	% 4	0 <u>50</u>) do	7 ⊘ €	(1) 9	0100	Ŋo	3	F.	F.	Š	ž	읽	3	6	3	200	SHE
1		: .								\vdash	+		-	-	\perp		-	-	-										
16-		; ;	i				-	-	 		k	Z	b		+	-	+	+	╁	-		-	╁	\dashv		-11			
\ <u></u> }	a	·	\$º-5H	8	94	Portygraded Scard with Silt	38	21	24.3		1							1	1_	_		L		_		41			
1 🕺	1					sand with					╀	\vdash		-+	+-	-			ł				П	ļ					
18 T						suc	-	 -	 		\dagger	H			\dagger			†-	Ħ		1								
									ļ		<u> </u>					_		Ţ.,	_	ļ	ļ	-							
										\vdash	-					-	-	+-	1										
=								1			1			_			}		 			-				İ			П
							_	<u> </u>	<u> </u>		+	-	_	}		- -	} .	ļ.,	-	-	-						<u> </u>		
=						ļ.				$\mid + \mid$	-	-			+	+	-+	- -	1	1		١							
								Ì	1	Ш	İ	1			_ _	Ţ					Ĺ	T						1	
-]							-	-	-		-	-				-	-		-	 	ļ	-	-			_	<u> </u> 	<u> </u>	
=										H	+	+	-	╟	+	╁		+-	1										
								İ	j	Ц	1	1-						- ··		T		T							
-							-	-		1 1	+	-		Ļļ	<u> </u>	. <u> </u> -			╁	<u> </u>	╀╌	╂-	<u> </u>			<u> </u>	<u> </u>	-	
, =		İ									\perp			- . !		1	İΪ	İ	1								<u> </u>		
=											_		ļ	-	- ‡-	-	-	+	-										
								\vdash		11	+	-j ·-		.	į	+	╁╁	-	$\cdot \mid$	<u> </u>	-	$^{+}$	╁		-	-	 	-	╁╌┧
=								_			1		 	† † -	1].				1	<u> </u>	1	ot			ļ	<u> </u>	╁	
										-	-		<u> </u>			-		i	-	ļ	Ì								
								-	+	++	-	-			:	-		1	\vdash	†		 		i-		†-		1	† {
			1 - 1	ŀ				$oldsymbol{\perp}$		Ţļ	1					1.					1	1	1	-	ļ	-	-	-	<u> </u>
		:				and the state of					-	-			. !	-	-	į											
		CAS DE		TiOt	√ A	S PER ASTM D					100 200		00 PEN	30 (4.4)			\$ 50 20.	9	-	_,	OR W/	HE	ER R	EN	COL	IN T	ERE)	
	ัยพ				<u></u>	CRAVEL	 ::	• • •	St				: '\$:	_;	ALC.	W[N	ED	ſ.		- -},			•		8		· ~	ÇHIS!	·
	**	a 11 8	DS 6880	×0		SANO	-] [CLAT			1	• • • •	끜.	EAT			C F	5565	ان <u>د</u> ناق	اعسى	510	٩E					: ARO HALE	
1/2	<u>2222</u> () s	<u>)</u>	470 SP.		200	<u> </u>			STIC	<u> </u>			UQ UM			-				<u>₩</u>	= 5 0	46	1 2	<u> </u>	<u>ਜ਼ੂਰ</u> ਅਰਵਾ				
589	Į v	√Ω•\$	r.;885.5	(5~5	.gr)	ı			ه چارن\$ ه به												730	430		. \$, , ,		
	_	NOS NOS	rupaco	(*•?	न€C	JV[R1] -		∴ : ()	e . a ;				' <u>c</u> t							Ŝ.	:.	. • •					e e e		
		٠.											_								.2 4.4 42			•		-			

LEE YOUNG &	PARTNERS GEOTECHNICA BOREHOLE TEST RECORD	L DEPARTMENT
JOB NO. W 690.	BORENOLE TEST RECORD	SHEET 1 OF 1
PROJECT Fisheries - Chateaubelour	DATE STARTED 19.11.97	LOCATION St. Mincent
TYPE BORING	DATE COMPLETED 26 . 11. 97	GROUND ELEVATION
SOIL PROFILE BESCRIPTION	SHEAR SIZENCIM KH/m2	D COULTEST (N TEST O COULTEST O COULTEST (N / M 2) (N / M 2)
DESCRIPTION	MATER CONTENT 3 STO, PENETRATION TEST- N-VALUE(SLOW/300mm) CU (NN/m²) & 0	THU TOOL TOOL TOOL TOOL TOOL TOOL TOOL TOO
DEPTH NEGRICATION OF THE PROPERTY OF THE PROPE	200 M	PLASTIC LIMIT PLASTIC LIMIT PLASTICITY INDEX CONSOLIDATION TEST HYDROMETRIES TEST SIEVE (W. & D) DU (MM/m.2.) THANAL © DEGREGS DU (MM/m.2.) THANAL © DEGREGS PRANAL POCKET PEN SHESSION TEST POCKET PEN SHESSION TEST POCKET PEN SHEAR VANE (MM/m.2)
DCP H SYNUADER SIRATIGRAPHIC FLOT SOUL CANO X FINES X SANO S SANO S SANO	10 50 50 55 10 50 30 40 50 40 50 60 50 10	CONSOLIDATEST PLASTICITY INDEX PLASTICITY INDEX CONSOLIDATION TEST SEVE (W. & D) CU (NN/M. ²) TRANSA © UNCONTINED COM OUT THE TEST SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²) SEVE (W. & D) CU (NN/M. ²)
		264
Su-sm 9 11 Well graded Send with	4 10-7 27-24	
2 Sult	4	24
3 3 3		
4-1	14-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	27
17 83	32 25 27 1	39
		-4
Silvy Sand	30	
5 Sand		
 	50 21-2	+
8 7X6 SM 16 PH SILL SOUND		
4-3/7		
	61	
Sc-50 M C Sty - Day		
15 Smd Super - 18 Supe	87 234 22 2	
12		
SOIL CLASSIFICATION AS PER ASTM D 2	2487~93 100 260 300 400§ 5	0 ORILLER
WATER DEPTH HOURS AFTER		WATER ENCOUNTERED
CRAVEL	SET CALCAREOUS	CCCCCCD SCHIST
SANO	CAT PEAT	Y >X (1 SEVENONEES SHAFE LINES OF THE HASO
\$ \$7480.490 \\ \text{\$P\$(0)} \\ \text{\$\frac{1}{2} \text{\$\frac{1} \text{\$\frac{1} \text{\$\frac{1} \text{\$\frac{1}{2} \text{\$\frac{1}{2} \$\f	CONT CONTENT W	■ UNCONFINED COMPRESSION (ES) © TRIADIAL (ES)
CONTROL (NO PECONERY)	A ST SKLE BROKE	A MANE SHEAR TEST
₩ () Alexand The Common Com	The grange of the form of the glasses of the grant of the	The Committee Committee of the Art.
	A-46	

Estimation of design wave

Offshore wave, equivalent wave and design wave at the location of the fish center at Kingstown were described hereinafter.

Characteristic of offshore wave

At the Saint Vincent, waves have not been observed. At time of the study of "Basic design study on fishing center in Saint Vincent and the Grenadines, JICA, 1996", offshore wave has studied. At this study, wave estimation data are based on the study since no hurricane has been attacked the Country since the previous study. In this study, ordinary wave and hurricane wave have been estimated as follow.

Ordinary wave

A recurring wave height for ordinary wave was estimated as follows from the ship observation data of offshore wave and wind. (Source: Kocks Consult GmbH)

Recurring Period and height for ordinary wave (Ho m)

Recurring				Wave di	rection			
Period	NE	Е	SE	S	sw	W	NW	N
1 year	3.8	4.1	2.8	1.6	0.8	0.7	1.0	2.4
10 years	4.9	5.2	3.5	2.8	3.3	1.8	2.6	3.8
20 years	5.2	5.5	3.8	3.2	3.8	2.2	3.1	4.2
50 years	5.6	6.0	4.0	3.8	4.5	2.5	3.7	4.8

Waves of S to SW is determined for the ordinary waves which affect directly the Kingstown area.

Hurricane wave

In the same study report, hurricane wave have been also estimated and showed the wave height and Recurring period as follow.

Recurring Period (years)	Wave height (m)
20	6.51
30	6.96
40	7.28
50	7.50

In this table, as wave direction is not clear, the estimation points and S to SW waves, which attack the Kingstown area directly, have been reexamined based on the study report. The estimation points of the report are 5 points. They are at southwest (St. Vincent 1) and southeast (St. Vincent 2) offshore of Kingstown, the main Island of the Country. Others are at the south of Bequia Island, and west and southeast of Canouan Island. As for hurricane, Allen (1980), Iris (1995) and Flora (1963) were selected among hurricane, which passed near the Country and made damages during 1955 to 1994. Beside the actual course of Flora, other two courses are considered for the estimation of the waves. One is the course, which passes on the Saint Vincent country. And other is the course, which is similar route as of Allen. Two estimation points, St. Vincent 1 and St. Vincent 2, were selected for the wave estimation points for Kingstown. At these 2 points, maximum significant wave (height, period, and direction) and, for the Kingstown, waves (height, period, and direction) from SW to S direction were selected as follow.

Maximum significant wave

H:height, P:Period, D:Direction

	Maximum				Maximum from SW to S							
Hurricane (year)	St. Vincent 1			St. Vincent 2		St. Vincent 1		St. Vincent 2				
	Н	Р	D	Н	P	D	<u> </u>	P	D	Ħ	Р	D
	m	Sec		m	sec		m	sec		M	sec	
Allen (1980)	4.59	10.3	E	4.55	10.4	Е		_				
Iris (1995)	3.35	7.7	NW	3.01	7.7	WNW				2.9	7.5	wsw
Flora(1963) Case I	3.03	9.3	ESE	4.75	10.9	ESE	2.5	9.3	sw	2.4	7.9	sw
Case 2	7.31	13.1	Е	9.10	14.2	Е	5.0	10.2	sw			.,,.
Case 3	3.47	9.0	NNW	3.32	10.6	ENE	_	-	-			

Offshore wave

Maximum significant wave, which were estimated from hurricane, have the wave direction of WNW to ESE. As these waves are not waves which attack the area of Kingstown directly, it is not proper to adopt as the waves for the Kingstown. However, waves which comes from S to SW are generated as the progress of hurricane. These S to SW waves will attack the Kingstwown area directly and have severe effect for the area. The characteristics of the S to SW wave are wave height of 2.4 m to 5.0 m, wave period of about 10 second and wave direction of SW to WSW as shown in the above table. Among the waves in this table, wave height of 5.0 m height, period of 10 second and direction of SW is determined as the design offshore wave. Ordinary wave (50 years of recurring period) and hurricane wave are as shown in the following table.

Characteristic of offshore wave(Kingstown)

Wave Direction	SW	SSW	S	SW*	
Wave Height (m)	4.5	4.2	3.8	5.0	
Wave Period (sec)	10.0	10.0	9.0	10.0	

^{*} shows hurricane wave

Equvalent wave

The estimation of the equivalent wave height from the offshore is computed by the Conservation Equation of Energy Flux Method by Karlsson, considering the sea contour condition obtained from the Chart. The result of distribution of the coefficient of the value of Kr x Kd at KIngstown site is shown in the Attachment - The equivalent wave at each site is shown bellow.

Kingstown

Sea bottom slope 1:06							
Design water level (DL, m)	+0.64						
Wave direction	sw	SSW	S	SW*			
Height of offshore wave (m)	4.2	4.2	3.8	5.0			
Period of offshore wave (sec)	10.0	10.0	9.0	10.0			
Length of offshore wave (m)	156.0	156.0	126.4	156.0			
Kr*Kd	0.833	0.773	0.567	0.833			
Equivalent wave height 11o'=Ho*Kr*Kd (m)	3.75	3.25	2.15	4.17			

^{*}wave of hurricane

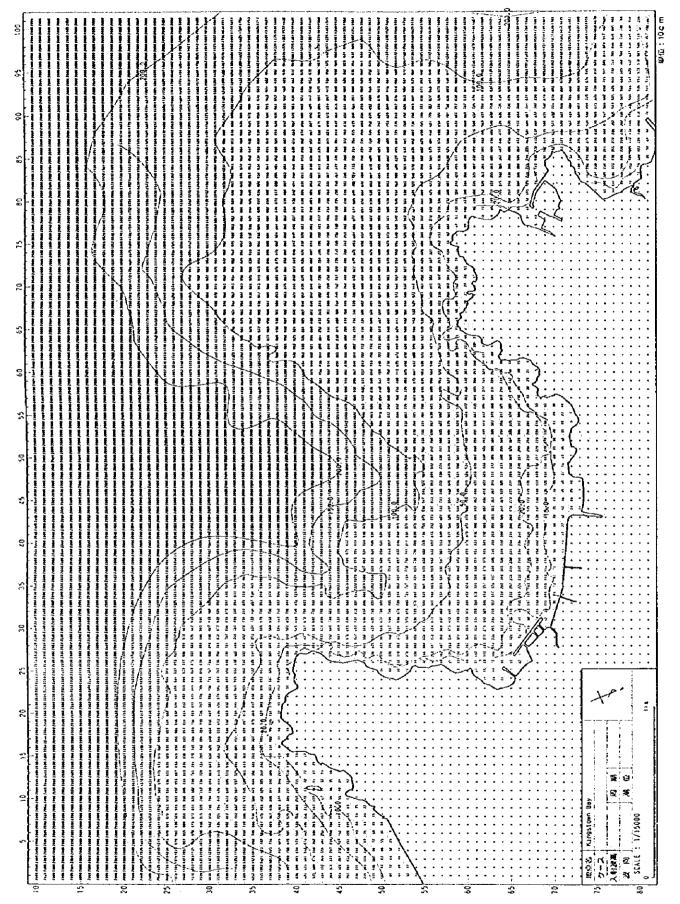
The design waves for the structure was selected from these results as follows.

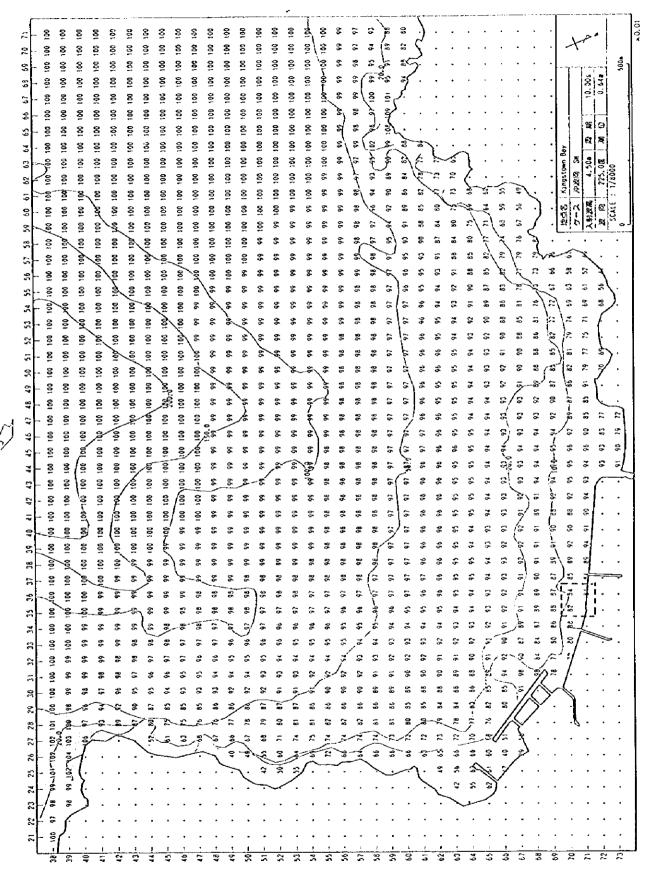
	Kingstown		
Wave Height (m)	4.17		
Wave Period (sec)	10.0		
Wave Length (m)	156.0		
Wave Steepness	0.0267		

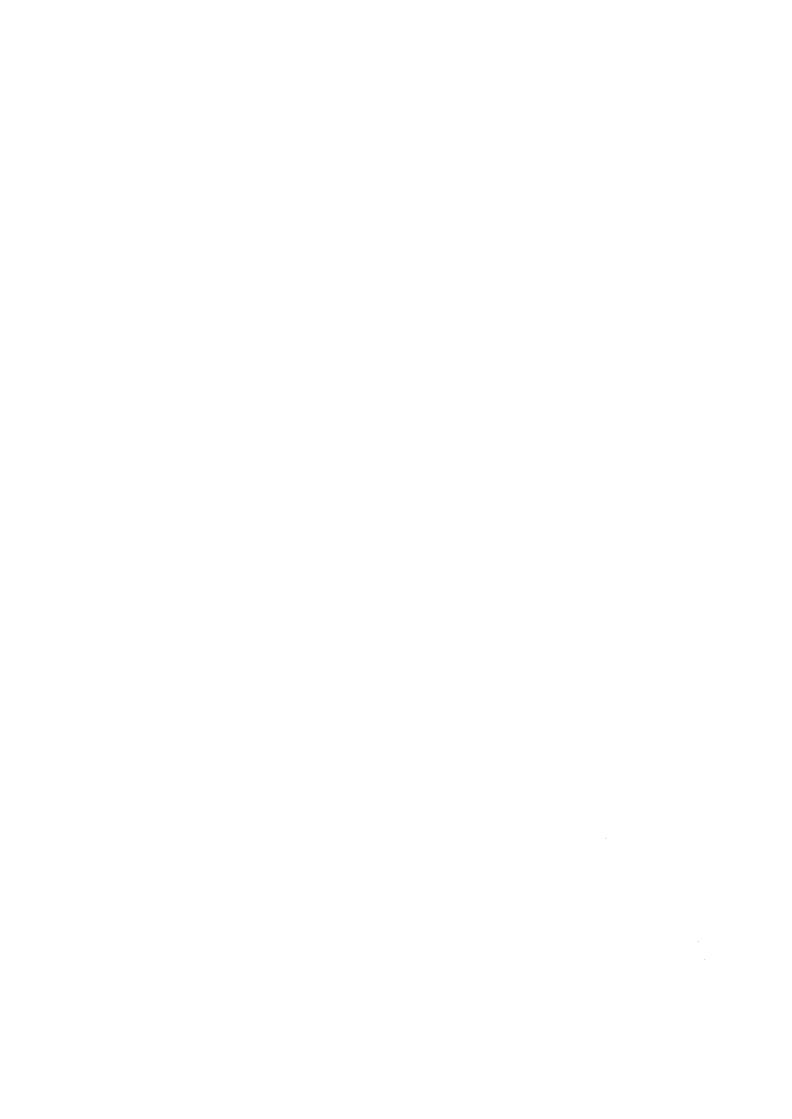
Wave Characteristic at the structure

At Kingstown, the waves at the location of different water are calculated considering the water depth as follows.

Water depth (m)	8.0	6.0	4.6	4.0	3.0
Water level (m)	0.62	0.62	0.62	0.62	0.62
Design water depth (m)	8.62	6.62	5.22	4.62	3.62
h/Ho'	2.07	1.59	1.25	1.11	0.87
II / Ho'	1.05	1.20	1.37	1.30	1.10
Wave Height II (m)	4.38	5.00	5.71	5.42	4.59









		V



