










CAPITAL DREDGING FOR INDIAN COAST GUARD JETTY BASIN IN COCHIN PORT

LOCATION OF BOREHOLES


PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD														
		GEO FOUNDATIONS & STRUCTURES PVT. LTD		Bore Hole No : DB-1				Boring Started : 24.01.2012						
				Type of Boring : Rotary				Boring Completed : 24.01.2012						
				Termination Depth : 10.00m				Height of water column : 3.4M				T-1613		
				Depth WRT MSL : -2.58										
LOCATION : WELLINGTON ISLAND														
SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	Depth in Mts. From Bed Level	Depth WRT to Mean Sea Level	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
							15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM ²	
	3.40	Water		3.40										
	1.30	Clayey Silty Sand (Dark Grey)	SC	1.00	-3.58	1.00-1.45	1	1	0	1				
	0.90	Sandy Clayey Silt (Dark Grey)	CH	2.00	-4.58	2.00-2.45	1	1	1	2				
	1.20	Silty Clayey Sand (Dark Grey)	SM	3.00	-5.58	3.00-3.45	1	1	1	2				
	1.60	Clayey Silty Sand (Dark Grey)	SC	4.50	-7.08	4.50-4.95	1	1	0	1				
	1.50	Silty Sand (Pale Grey)	SP-SM	6.00	-8.58	6.00-6.45	2	2	3	5				
	3.50	Sandy Clayey Silt (Dark Grey)	CI	7.50	-10.08	7.50-7.95	UDS-1							
				9.00	-11.58	9.00-9.45	1	0	1	1				
				10.0	-12.58	10.0-10.45	UDS-2							

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Termination Depth : 10.00m

Fig : 154

Name of Work:SOIL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD		Location : Fort Kochi		Height of Water column :3.4m Depth WRT MSL : -2.58		Date of Boring Started: :24.01.12 Date of Boring Completed: :24.01.12 Termination Depth : :10.00M		Table No.21		 T-1613										
N	DEPTH(M)			SAMPLE	SOIL DESCRIPTION	I.S. CLASS	GRAIN SIZE ANALYSIS(%)					ATTERBERG'S LIMIT(%)			UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS			
					GRA - VEL	SAND	SILT	CLAY	NMC (%)	LL	PL	PI	SL (%)	FSI (%)	SPG	WET	DRY	METHOD	C kg/cm ²	Ø (°)
BOREHOLE /DB-1																				
1	1.00	SPT1	Clayey Silty Sand (Dark Grey)	SC	0	59	21	20	47	36					2.57					
2	2.00	SPT2	Sandy Clayey Silt (Dark Grey)	CH	0	36	33	32	67	92	32	60			2.49					
2	3.00	SPT3	Silty Clayey Sand (Dark Grey)	SM	0	86	2	12	28	No Limit					2.58					
1	4.50	SPT4	Clayey Silty Sand (Dark Grey)	SC	0	55	24	22	56	35					2.59					
5	6.00	SPT5	Fine Sand (Ple Grey)	SP-SM	0	92	8	0	24	No Limit					2.61					
-	7.50	UDS-1	Sandy Clayey Silt (Dark Grey)	CI					61						2.49	1.43	0.78	UCS	0.182	-
1	9.00	SPT6	Sandy Clayey Silt (Dark Grey)	CI	0	39	35	27	74	41	20	21			2.48					
-	10.00	UDS-2	Sandy Clayey Silt (Dark Grey)	CI					57							1.41	0.72	UCS	0.114	-

: 181 :

PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD

	GEO FOUNDATIONS & STRUCTURES PVT. LTD	Bore Hole No	: DB-2	Boring Started	: 17.01.2012	 T-1613
		Type of Boring	: Rotary	Boring Completed	: 17.01.2012	
		Termination Depth	: 10.00m	Height of water column	: 2.30M	
		Depth WRT MSL	: -1.73			

LOCATION : WELLINGTON ISLAND


SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	Depth in Mls. From Bed Level	Depth WRT to Mean Sea Level	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
							15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM ²	
	3.40	Water		2.30										
	5.20	Sandy silty clay with shell dust (Dark grey)	CH	1.00	-2.73	1.00-1.45	0	0	0	<1				
				2.00	-3.73	2.00-2.45	UDS-1							
				3.00	-4.73	3.00-3.45	0	0	0	<1				
				4.50	-6.23	4.50-4.95	UDS-2							
	1.40	Clayey silty sand with shell dust(D/grey)	SM	6.00	-7.73	6.00-6.45	1	1	1	2				
				7.50	-9.23	7.50-7.95	2	3	3	6				
	2.30	Fine sand(Pale grey)	SP-SM	9.00	-10.73	9.00-9.45	1	0	0	<1				
				10.0	-11.73	10.0-10.45	UDS-3							
	1.10	Sandy clayey silt with shell dust (D/grey)	CH											

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Termination Depth : 10.00m

Fig : 157

		Name of Work:SOIL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD																		
		Location : Fort Kochi		Height of Water column :2.3m Depth WRT MSL : -1.73			Date of Boring Started: : 17.01.12 Date of Boring Completed: :17.01.12 Termination Depth : : 10.0M			Table No.22			 T-1613							
N	DEPTH(M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASS	GRAIN SIZE ANALYSIS(%)				NMC (%)	ATTERBERG'S LIMIT(%)			SL (%)	FSI (%)	SPG	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS		
					GRAVEL	SAND	SILT	CLAY		LL	PL	PI				WET	DRY	METHOD	C kg/cm ²	Ø (°)
BOREHOLE /DB-2																				
<1	1.00	SPT1	Sandy Silty Clay with Shell dust (Dark Grey)	CH	0	5	35	60	158	130	45	85			2.48					
-	2.00	UDS-1	Sandy Silty Clay with Shell dust (Dark Grey)	CH												1.79	1.40	UCS	0.117	-
<1	3.00	SPT2	Sandy Silty Clay (Dark Grey)	CH	0	4	47	49	159	118	40	78			2.48					
-	4.50	UDS-2	Sandy Silty Clay (Dark Grey)	CH												1.77	0.96	UCS	0.131	-
2	6.00	SPT3	Clayey Silty Sand with Shell dust(Dark Grey)	SM	0	72	15	12	37	No Limit					2.59					
6	7.50	SPT4	Fine Sand (Pale Grey)	SP-SM	0	97	3	0	24	No Limit					2.60	2.08	1.76	DST	0	33
<1	9.00	SPT5	Sandy Clayey Silt with Shell dust (Dark Grey)	CH	0	9	54	37	92	129	43	86			2.45					
-	10.00	UDS-3	Sandy Clayey Silt with Shell dust (Dark Grey)	CH												1.67	1.57	UCS	0.248	-

: 187 :

PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD

**GEO
FOUNDATIONS &
STRUCTURES PVT.
LTD**

Bore Hole No : **DB-3**
Type of Boring : Rotary
Termination Depth : 10.00m
Depth WRT MSL : -1.92

Boring Started : 23.01.2012
Boring Completed : 23.01.2012
Height of water column : 2.50M



T-1613

LOCATION : WELLINGTON ISLAND



SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	Depth in Mts. From Bed Level	Depth WRT to Mean Sea Level	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
							15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM ²	
	3.40	Water		2.50										
	10.0	Silty clay with sand pockets (Dark grey)		1.00	-2.92	1.00-1.45	0	0	0	<1				
				2.00	-3.92	2.00-2.45	UDS-1							
				3.00	-4.92	3.00-3.45	0	0	0	<1				
				4.50	-6.42	4.50-4.95	UDS-2							
				6.00	-7.92	6.00-6.45	0	0	0	<1				
				7.50	-9.42	7.50-7.95	UDS-3							
				9.00	-10.92	9.00-9.45	1	1	1	2				
				10.0	-11.92	10.0-10.45	UDS-4							

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"



Termination Depth : 10.00m

Fig : 163



		Name of Work:SOIL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD														 T-1613				
		Location : Fort Kochi		Height of Water column :2.5m Depth WRT MSL : -1.92		Date of Boring Started: : 23.01.12 Date of Boring Completed: : 23.01.12 Termination Depth : : 10.0M		Table No.23												
N	DEPTH(M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASS	GRAIN SIZE ANALYSIS(%)				NMC (%)	ATTERBERG'S LIMIT(%)			SL (%)	FSI (%)	SPG	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS		
					GRA - VEL	SAND	SILT	CLAY		LL	PL	PI				WET	DRY	METHOD	C kg/cm ²	Ø (°)
BOREHOLE /DB-3																				
<1	1.00	SPT1	Silty Clay with Sand Pockets (Dark Grey)	CH	0	3	33	64	181	189	45	144			2.43					
-	2.00	UDS-1	Silty Clay with Sand Pockets (Dark Grey)	CH																
<1	3.00	SPT2	Silty Clay with Sand Pockets (Dark Grey)	CH	0	4	45	51	173	137	42	95			2.42					
-	4.50	UDS-2	Silty Clay with Sand Pockets (Dark Grey)	CH												1.4	0.79	UCS	0.279	-
<1	6.00	SPT3	Silty Clay with Sand Pockets (Dark Grey)	CH	0	5	44	52	95	186	43	143			2.48					
-	7.50	UDS-3	Silty Clay with Sand Pockets (Dark Grey)	CH												1.28	0.56	UCS	0.162	-
2	9.00	SPT4	Clayey Silt with Sand pockets (Dark Grey)	CH	0	2	68	30	101	100	40	60			2.47					
-	10.00	UDS-4	Clayey Silt with Sand pockets (Dark Grey)	CH																

: 194 :

PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD

	GEO FOUNDATIONS & STRUCTURES PVT. LTD	Bore Hole No	: DB-4	Boring Started	: 23.01.2012	 T-1613
		Type of Boring	: Rotary	Boring Completed	: 23.01.2012	
		Termination Depth	: 10.00m	Height of water column	: 5.20M	
		Depth WRT MSL	: -4.32			

LOCATION : WELLINGTON ISLAND


SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	Depth in Mts. From Bed Level	Depth WRT to Mean Sea Level	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
							15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM ²	
	3.40	Water		5.20										
	10.0	Silty clay with sand pockets (Dark grey)		1.00	-5.32	1.00-1.45	0	0	0	<1				
				2.00	-6.32	2.00-2.45	UDS-1							
		3.00		-7.32	3.00-3.45	0	0	0	<1					
		4.50		-8.82	4.50-4.95	UDS-2								
		6.00		-10.32	6.00-6.45	1	1	1	2					
		7.50		-11.82	7.50-7.95	UDS-3								
		9.00		-13.32	9.00-9.45	1	1	1	2					
		10.0		-14.32	10.0-10.45	UDS-4								

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

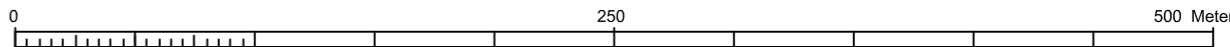
Termination Depth : 10.00m

Fig : 167

		Name of Work:SOIL INVESTIGATION WORK FOR THE PROPOSED BERTH FOR INDIAN COAST GUARD														 T-1613			
		Location : Fort Kochi			Height of Water column :5.2m Depth WRT MSL : -4.32				Date of Boring Started: :23.01.12 Date of Boring Completed: :23.01.12 Termination Depth : :10.0M			Table No.24							
N	DEPTH(M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASS	GRAIN SIZE ANALYSIS(%)				NMC (%)	ATTERBERG'S LIMIT(%)			SL (%)	FSI (%)	SPG	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS	
					GRA - VEL	SAND	SILT.	CLAY		LL	PL	PI				WET	DRY	METHOD	C kg/cm ²
BOREHOLE /DB-4																			
<1	1.00	SPT1	Silty Clay with Sand Pockets (Dark Grey)	CH	0	3	43	53	222	160	45	115			2.47				
-	2.00	UDS-1	Silty Clay with Sand Pockets (Dark Grey)	CH															
<1	3.00	SPT2	Clayey Silt with Sand Pockets (Dark Grey)	CH	0	3	53	45	165	159	41	118							
-	4.50	UDS-2	Clayey Silt with Sand Pockets (Dark Grey)	CH					65						1.31	0.62	UCS	0.323	-
2	6.00	SPT3	Clayey Silt with Sand Pockets(Dark Grey)	CH	0	3	57	40	116	147	40	107							
-	7.50	UDS-3	Clayey Silt with Sand Pockets (Dark Grey)	CH															
2	9.00	SPT4	Silty Clay with Sand Pockets (Grey)	CH	0	1	47	51	64	98	35	63							
-	10.00	UDS-4	Silty Clay with Sand Pockets(Grey)	CH					33						1.24	0.67	UCS	0.103	-

: 199 :

SOUNDINGS AT THE PROPOSED COAST GUARD JETTY IN COCHIN PORT
HYDROGRAPHIC SURVEY AS ON 04 JUNE 2020
SURVEYED BY SRI. DEVARAJ P KARTHA ASSISTANT MARINE SURVEYOR
AND STAFF OF HYDROGRAPHIC SURVEY WING ALAPPUZHA
UNDER THE DIRECTION OF THE CHIEF HYDROGRAPHER
TO THE GOVERNMENT OF KERALA



SCALE 1:2000

WGS 84 DATUM, TRANSVERSE MERCATOR PROJECTION
SOUNDINGS ARE IN METERS AND DECIMETERS
Soundings are reduced to Cochin Port Chart Datum which is 0.582 m below IMSL and
3.3m below A.T.G table top located in front of Deputy Conservator office CoPT

