

SOIL INVESTIGATION REPORT

PROJECT

GEO TECHNICAL INVESTIGATION FOR CONSTRUCTION OF BRIDGE OVER MIDDLE STRAIT CREEK IN THE UNION TERRITORY OF A&N ISLANDS

CLIENT
M/s. SAI INFRATECH STUDIO

TITLE
REPORT
(LAND AND MARINE)

SEPTEMBER 2021

GEO FOUNDATIONS & STRUCTURES PVT LTD

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GEO TECHNICAL INVESTIGATION REPORT

1.0 INTRODUCTION

- 1.1The work of "Geo-Technical Investigation for construction of Bridge over Middle strait Creek in the Union Territory of Andaman & Nicobar Islands", was entrusted to M/s. Geo Foundations and Structures (P) Ltd. Port Blair, India, by M/s Sai Infratech Studio, Ghaziabad.
- 1.2 The soil Investigation works were carried out from March to May 2019 & February to May 2020. This report summarizes the results of the soil investigation and presents recommendation for suitable type of foundations for the proposed structure.

2.0 OBJECTIVE OF INVESTIGATION

2.1 The objective of geotechnical investigation is to determine the nature and characteristics of sub-soil below the ground level / bed level for the proposed structure.
The study includes identification of suitable type of foundations for the proposed structure and assessment of safe bearing capacity.

3.0 SCOPE OF WORK

The scope of work at this site comprises of the following:

- 3.1 Mobilization of boring rigs with all necessary equipments and personnel.
- 3.2 Boring of **8** bore holes in marine boreholes of 150 mm diameter with Calyx drilling equipments through sand, silt, clay, weathered rock soft rock & hard rock,.
- 3.3 Conducting Standard Penetration Tests in the bore holes and collecting the disturbed but representative soil samples including packing and transportation to laboratory.
- 3.4 To conduct the following laboratory tests on soil samples:
 - (a) Sieve analysis

Client : Sai Ir	ıfratec	h StudioConducting Sub soil investigation for construction of bridge over Middle Strait Creek in Union Territory of A&N Islands
	(b)	Hydrometer analysis
	(c)	Index properties:
		(i) Liquid limit
		(ii) Plastic limit
		(iii) Shrinkage limit
	(d)	Natural moisture content
	(c)	Wet & bulk density
	(d)	Consolidation Test including pre consolidation pressure
	(e)	Specific gravity
	(f)	Tri-axial shear test
	(g)	Free swell index test
	(h)	Direct shear test
	(i)	Permeability Test
	(j)	Chemical analysis of water
	For re	ock samples
	(a)	Specific Gravity
	(b)	Crushing Strength

3.5 Preparation and submission of detailed report of field and laboratory results with

recommendations for foundations.

4.0 <u>FIELD INVESTIGATIONS-GEO-TECHNICAL STUDIES</u>

- 4.1Boring rigs with all requisite equipments and accessories were mobilized at the worksite.

 A team of technical personnel with skilled labours were also deputed.
- 4.2This report consists of **8** bore hole (MBH 1 to MBH 8) **marine** bore holes of 150 mm diameter were bored to a maximum depth up to **39 m** below the sea bed level. The bore holes were made as per relevant Indian Standard IS: 1892.
- 4.3Representative soilsamples were collected in the bore holes at every change of strata or about 1.5 m depth interval up to termination depth from the exiting ground level, the samples so collected were sealed and numbered with full particulars for identification and sent to the laboratory for conducting the required tests.
- 4.4Standard Penetration tests were conducted in the bore holes at 1.5 m depth interval up to termination depth, as per the relevant Indian Standard, IS: 2131. In this test, a standardsplit spoon sampler is driven into the ground at the required depth by means of standard hammer of 63.5 kgs weight, falling from a height of 75 cm. Number of blows for the first 15 cm is not taken into consideration because of possible disturbances or presence of settled, suspended matters at the bottom of the boreholes. The total number of blows for the next 30 cm depth of penetration is considered as SPT 'N' value as shown in borelogs.





Fig.1. Sub Soil Investigation being Carried out at Baratang (Land Borehole)





Fig.2. Sub Soil Investigation being Carried out at Baratang (Marine Borehole)



Fig.3. Soil Sample collected in SPT Sampler

5.0 **GROUND WATER LEVEL**

Ground water levels were met at ground level at the time of investigation, during continuous boring from **09.03.2019** to **23.03.2019** & **20.02.2020** to **12.05.2020**.

Bore hole No	Location	Depth of Boring in m	Water Level observed during drilling.
MBH - 6	P-6	32.60	3.5 m from sea bed
			level
LBH-07	A-1	27.04	
MBH- 2	PC5	39.04	(-)15.8 m from C.D
MBH -3	P-2	30.05	(-)13.08 m from C.D
MBH -4	PC1	36.05	(-)13.87 m from C.D
MBH -5	PC3	37.60	(-)25.11 m from C.D
MBH-07	PC2	36.00	(-)21.00 m from C.D
MBH-08	PC4	37.00	(-)24.60 m from C.D

6.0 DISCUSSION AND RECOMMENDATIONS ON RESULTS AND TYPE OF FOUNDATIONS:

Bore holes were made for soil investigation to assess the nature and strength of the subsoil strata for sustainability of the loads. This report gives the details of the soil strata, suitable type of foundation and safe carrying capacity. Based on the subsoil conditions described, the following recommendations are made for suitable type of foundation for the proposed structure.

- Considering the presence of very soft to medium stiff clayey soil with low SPT N values in the top layers, and the ground water table is at a very shallow depth (at 0 m to 0.4 m from ground level for Bh 1,4,5 & 6 and 5.5 m to 6 m from ground level for Bh 2 & 3) which will undergo settlement under the surcharge load due to a proposed filling of about 1 m thickness over a period of time, open foundations are not feasible, therefore, **pile foundations** are recommended.
- For strengthening the loose soil in the area, a ground improvement method by lime slurry injection is recommended.
- The procedure for lime slurry injection is given in Enclosure 1.

- Ground improvement by lime slurry injection for a depth of at least 10 m below the E.G.L. is recommended (only for BH 1 to 6). This will also minimize negative drag, and also will avoid scouring of the soil around the pile.
- Since the plasticity Index comes above A-line with PI > 7 (see Fig.1, Plasticity chart of IS 1498 –
 1970), the soil behaves like clay and there will not be any possibility of liquefaction.
- After ground improvement, pile capacity will be higher than the value given in the present calculation.
- Since clay percentage is more than 60%, we consider only cohesion neglecting the angle of shear resistance or angle of repose for pile capacity calculation purpose, therefore for soil in our calculation, we consider the soil as clay and not as sand.

Pile foundation

- Bored cast in situ concrete pile foundations of length from existing ground level having different diameters as given in table 13 & 14are recommended. Minimum Grade of concrete IS M30.
- The pile bore will be terminated at a depth of minimum of 4 m into hard stratum (where
 five consecutive SPT 'N' values of more than 100 are obtained in each SPT, at depth
 intervals of one pile diameter).
- According to the structural strength of concrete determined for different pile diameters,
 we assume 5 grades less, to allow for underwater concreting, and therefore, we
 consider M25 grade concrete.
- The recommended safe load carrying capacities of bored cast in situ concrete piles are presented in table 13 & 14.

Reference Borehole	Length of Pile (m)	Recomme	ended Vertico	ıl Capacity	Recomme	ended Uplift	Capacity
				Diamete	r (mm)		
	-	1200	1500	1800	1200	1500	1800
LBH-7 (A1)	14.5	475	700	1000	350	350	500
MBH - 1 (P1)	10.7	400	625	900	50	70	90
MBH – 2 (PC5)	41.8	500	1000	1500	350	600	700
MBH - 3 (P2)	25.58	500	800	1000	300	350	450
MBH - 4 (PC1)	39.87	500	1200	1200	500	500	500
MBH - 5 (PC3)	58.61	500	1200	1200	500	500	500
MBH -6 (P6)	30	475	750	1000	225	300	400
MBH-7 (PC2)							
MBH-8 (PC4)							

Table - 14

Reference	Length of	Reco	mmended Later	al Capacity
Borehole	Pile (m)		Diameter (m	m)
		1200	1500	1800
LBH-7 (A1)	14.50	25	40	70
MBH – 2 (PC5)	41.80	20	17.5	12
MBH - 3 (P2)	25.58	25	60	70
MBH - 4 (PC1)	39.87	25	60	70
MBH - 5 (PC3)	58.61	25	60	75
MBH -6 (P6)	30	20	30	45
MBH - 7 (PC2)				
MBH - 7 (PC4)				

R.C.C. BORED CAST IN SITU PILE

Safe capacity of RCC Bored cast-in-situ pile can be computed by using the formula given in IS:

2911 (Part-1/Sec-2)-1979:

Ultimate bearing capacity Qu of piles in Cohesion less soil:

l=n

Qu= Ap(0.5.D. \square .N \square +PD.Nq) + \sum k .PDi .tan \square . Asi

I=1

Where,

Ap= Cross sectional area of pile toe in cm²

D= Stem dia. in cm

□= Effective unit weight of soil at pile toe in kg /cm³

PD = Effective overburden pressure in Kg / cm²

 $N\square$ and Nq = Bearing capacity factors depending upon the angle of internal friction \varnothing at toe

i = n

 Σ = Summation of N layers in which pile is installed i = 1

K = Coefficient of earth pressure

PDi = Effective overburden pressure in Kg /cm² for the ith layer where i varies from 1 to n.

 δ = Angle of wall friction between pile and soil in degree (may be taken equal to \varnothing)

Asi=Surface area of pile stem in cm² in the ith layer where i varies from 1 to n.

For cohesive soil:-

Safe capacity of pile = 1/F (AP.Nc.Cp + a. C.As)

Where,

Ap- c/s area of pile toe in cm²

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Nc- bearing capacity factor
Cp- average cohesion at pile tip in Kg/cm²
🛘 - Reduction factor
C – Average cohesion throughout the length of pile in Kg/cm ² s- Surface area o
pile shaft in cm²
F - Factor of safety.
.OThe results given in this report are based on the results of the soil investigation carried out. Ir
ctual execution, if any variation is found, the consultants may also be referred to.
For GEO FOUNDATIONS & STRUCTURES PVT. LTD
A. Suresh Kumar, M.Tech (Geo technical), M.B.A (T.M
G.M. (Geo Technical
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(Floressor & nedd, Ocean Engineering Dept. in Madras)(kla), (Ciner Consolidin)

Enclosure 1

SPECIFICATIONS FOR LIME SLURRY INJECTION FOR GROUND IMPROVEMENT

 $1. \hspace{1.5cm} \textbf{Depth of injection} \hspace{3.5cm} : \hspace{3.5cm} \textbf{From ground level up to 10 m depth below the ground level} \\$

which existed at the time of soil investigation

2. Concentration of lime slurry: 200 to 300 grams of hydrated lime in one litre of water

3. Wetting agent : Chemical intrusion aid such as "Calcium ligno sulphonate",

one part in 1500 parts of water

4. Expected consumption : 100 litres of lime slurry for every 1 m depth of injection

- 5. Injection tube: An inner tube shall have a hole at its lower tip to wash or jet the injector into the ground with slurry. An outer tube (about 50 mm diameter) shall have at least 40 perforations in its lower 250 mm length. When the injector reaches the specified depth, the outer tube's valve is turned on and the lime slurry has to be forced into the soil through the perforations laterally, and through the hole at the tip, vertically. The diameter of each perforation can be 3 to 5 mm or alternately, drill a hole to the required depth and insert the pipe with perforations in the lower part.
- 6. Spacing of injection points: 1.2 m centre to centre in a triangular grid. It is desirable to select alternate grid points or every third grid point in the first phase of injection. In the second phase of injection, the other alternate grid points or the other every third grid point may be selected, so that the soil in which Lime slurry has already been injected in the first phase will gain strength and the consumption of Lime slurry can be optimized.
- 7. Injection pressure : The injection pressure shall be of the order at least 10 kg/cm²
- 8. Duration of injection at any point: The process of injection shall be continued until no more lime slurry can be injected, as reflected by a rapid rise in the injection pressure.
- 9. The lime slurry concentration given in Sl. No. 2 above is only a guide line. The slurry concentration may have to be increased or decreased based upon trial injection.

- 10. Two layers of sand bags may be placed on the ground surface, in order to provide confinement to the injection grout.
- 11. After grouting is done at each injection point, the grout hole shall be plugged, to prevent the grout (which was injected under pressure) from gushing out.
- 12. To facilitate the chemical reaction between the lime and the clay, moisture is required. (This is similar to curing of cement concrete). For this purpose, water may be sprayed once a day, for a period of one month. It may be noted that the curing period for almost the full benefit to accrue is about 60 days.

13. **VERY IMPORTANT:**

- (i) Powder dry Shell lime shall be used. It shall be mixed with water only just before injection is carried out.
- (ii) The available Calcium Oxide in the lime shall not be less than 60 %.
- (iii) The lime powder shall be stacked, protecting it against rain during monsoon periods.
- (iv) The most suitable time for best benefits in terms of quantity of lime slurry injection is summer months (April to May)

A Record of the amount of Lime Slurry Injected at each point of injection and the concentration of lime used for mixing the slurry shall be maintained.

APPENDIX I

BORE LOG

No of UDS

Project: Soil investigation for construction of bridge over middle strait creek in the union territory of A&N Islands. Location BARATANG(Near Drillhole Record - BH-01 Abutment-Fig No. 04 2) : BH-01 X:474371.1315 Bore Hole No Type of Boring : Y: 1344930.4016 : Rotary Drilling Reduced Level Z:1.4560 **GEO FOUNDATIONS &** Water Level : 40 cm below G.L. Start Date : 09.03.2019 STRUCTURES PVT. LTD : 14.03.2019 Termination Depth : 30.77 m End Date GROUND LEVEL (m) SPT"N" Blows/300mm PENETRATION (EST DEPTH SPT 'N' PROFILE SAMPLE TYPE **VALUES** DEPTH (m) SOIL DESCRIPTION R.Q.D(%) REMARKS **TEST NO** C.R (%) G.W.L 8 20 4 9 80 Loose SAND SPT-01 1.50 1.50-1.95 2 2 4 UDS-01 DS 2.00 **UDS Slipped** 3.00 SPT-02 SS 3.00 3.00-3.12 >50 >100 12 cm penetration for first 50 blows Very Dense Clayey Sandy **GRAVEL** 3 cm penetration for SPT-03 SS 4.40 4.40-4.43 >50 >100 4.45 first 50 blows 27.0 4.45-5.00 0.0 CR-01 CS 4.45 CR-02 5.00-6.50 13.0 8.3 CS 5.00 CR-03 6.50 CS 6.50-8.00 10.0 10.0 **ROCK** 6.7 CR-04 8.00 8.00-9.50 6.7 CS 9.50 CR-05 CS 9.50 9.50-11.00 0.0 0.0 DI Rock with CLAY Note: SPT-Standard Penetration Soil Sample, CS-Core Sample DS-Disturbed soil k Quality Designation 10.00 No. of. SPT : 15 REMARKS

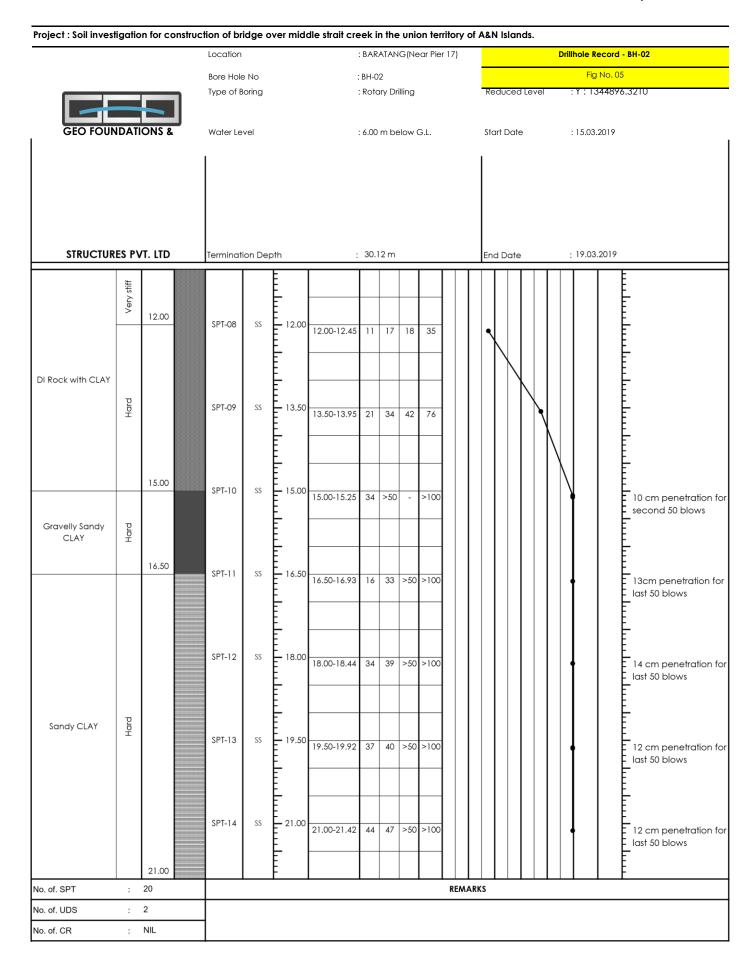
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Silty CLAY	15.50	SPT-05	SS = 15.50	15.50-15.95	12 30	41	71		
	17.00	SPT-06	SS = 17.00	17.00-17.45	16 37	43	80		
Sandy Silty CLAY 말		SPT-07	SS 18.50	18.50-18.95	15 24	33	57		
보		SPT-08	SS 20.00	20.00-20.45	18 27	42	69		
	21.50	SPT-09	SS 21.50	21.50-21.95	21 30	41	71	•	
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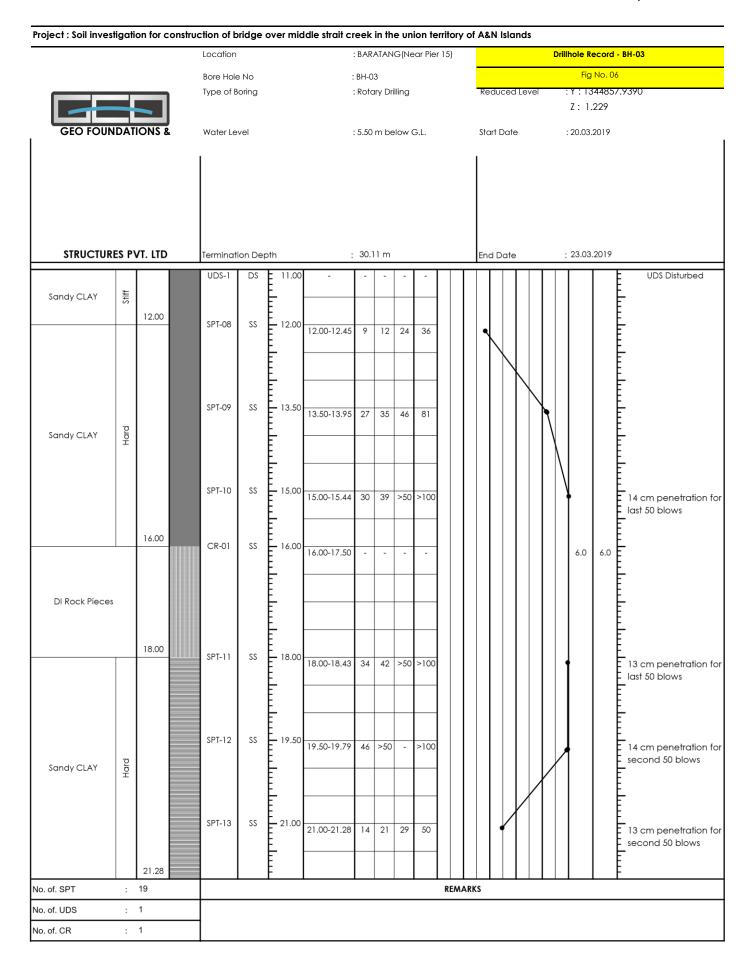
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				Bore Hole				: BH-02													No. 05		
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Project: Soil investigation for construction of bridge over middle strait creek in the union territory of A&N Islands. Location : BARATANG (Near Pier 17) Drillhole Record - BH-02 Fig No. 05 Bore Hole No : BH-02 : Rotary Drilling Type of Boring Reduced Level :Y:1344896.3210 Water Level : 6.00 m below G.L. Start Date : 15.03.2019 STRUCTURES PVT. LTD Termination Depth 30.12 m End Date : 19.03.2019 SPT-15 SS 22.50 22.50-22.93 42 46 >50 >100 13 cm penetration for last50 blows SPT-16 SS 24.00 24.00-24.41 45 48 >50 >100 11 cm penetration for last50 blows SPT-17 25.50 25.50-25.78 47 >50 >100 13 cm penetration for second 50 blows Sandy CLAY SPT-18 SS **-** 27.00 27.00-27.14 >50 >100 14 cm penetration for first 50 blows SPT-19 SS 28.50 28.50-28.63 >50 >100 13 cm penetratio for first 50 blows SPT-20 SS 30.00 30.00-30.12 >50 >100 12 cm penetration for first 50 blows 30.12 No. of. SPT 20 **REMARKS** No. of. UDS 2 No. of. CR NIL

				Location				:BAR	ATAN	G(Ne	ar Pier	r 15)							Drill	nole R	ecord	- BH-03
				Bore Hole	e No		:	: BH-0	3											Fig	No. 0	6
				Type of B	oring			: Roto	ary Dri	lling				Re	educ	ed Le	evel			Y:13 Z:1.		7.9390
252 52111																						
GEO FOUN	DAI	ION2 &	t	Water Le	vel			: 5.50	m be	low (Э.L.			St	art D	ate			:	20.03.	2019	
STRUCTUR	ES P	VT. LTD		Terminat	ion Dep	oth	:	30.	11 m					En	nd Do	ate			:	23.03	.2019	
		EVEL			H.		(E)		ETRAI	ION	. mm			SPT	'N' P	ROFI	LE					
SOIL DESCRIPTION	STRUCTURE	GROUND LEVEL (m)	QN	9	SAMPLE TYPE	DEPTH (m)	теѕт DЕРТН(т)	<u> </u>	/ALUE	S	SPT"N" Blows/300mm	_		···					\Box	(%	(%)	REMARKS
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						-																-
				SPT-03	SS	Ē		L														_
	_					4.50	4.50-4.95	2	3	3	6	Ī										Ę.
Sandy CLAY	Medium					E																G.W.L
	-≨-	ļ		ļ		-						††	-†-		1	٠†٠		ļ-·	†- †			=
				SPT-04	SS	6.00	6.00-6.45	2	2	3	5	•										-
						-																-
						E																
		7.50		SPT-05	SS	7.50																Ē
				311-03	33	7.50	7.50-7.95	3	4	5	9	•										E
						E																Ē
						F																F
	_			SPT-06	SS	9.00	9.00-9.45	4	4	5	9											<u> </u>
Sandy CLAY	Stiff					E	7.00-7.40	_	_		′											E
						Ē																Ē
						Ē																Ē
				SPT-07	SS	10.50	10.50-10.95	4	6	6	12		1									Ē
lo. of. SPT	_	10.50 19				F						D.	MAR) Ke		\perp		L				<u>F</u>
lo of LIDS		1										ĸt	MAIN									
o, of, UDS h te: SPT-Standard P o, of, CR	enetri :	ation Test	lio2-22	ample,		C	CS-Core Samp	ole DS	S-Distu	ırbec	soil				CR-	Core	Rec	cove	ery	, RQD	-Rock	Quality Designation



Project : Soil investi	igatio	on for c	onsi	truc	tion of br	ridge	over mid	dle strait cr	eek i	in the	e uni	on ter	ritory c	of A&	N Isla	ınds				
					Location			:	BARA	ATANO	G(Ne	ar Pier	15)				D	rillhole	Record	- BH-03
					Bore Hole				BH-03										ig No. 0	
	Į				Type of Bo	oring		:	Rota	ry Dril	ling			Re	duced	l Leve	l		134485 1.229	7.9390
GEO FOUN	DATI	ONS &			Water Lev	/el		:	5.50 ו	m bel	low C	€.L.		Sta	rt Date	е		: 20.0	03.2019	
STRUCTURI	ES P\	VT. LTD			Terminati	ion De	pth	:	30.1	1 m				End	d Date	е	_	: 23.	.03.2019	
							ŧ													Ę
							E													E
					SPT-14	SS	22.50	22.50-22.63	>50	-	-	>100				Ш		+		13 cm penetration for
							F					-								second 50 blows
							Ė									Ш				-
					SPT-15	SS	24.00													E
							E 24.00	24.00-24.12	>50	-	-	>100						1		12 cm penetration for first 50 blows
							F													-
							F									Ш				F
					SPT-16	SS	25.50	25.50-25.63	>50	-	_	>100						1		13 cm penetration for
Sandy CLAY	Hard						E									Ш				first 50 blows
	I						Ē													_
							E													
					SPT-17	SS	27.00	27.00-27.12	>50	-	-	>100				Ш		+		12 cm penetration for
							F									Ш				first 50 blows
							Ē.													E
					SPT-18	SS	28.50													E
							£ 20,00	28.50-28.60	>50	-	-	>100						1		10 cm penetratio for first 50 blows
							F													F
							E					$\vdash \vdash$								E
					SPT-19	SS	30.00	30.00-30.11	>50	-	_	>100				Ш		ļ		11 cm penetration for
		30.11					<u>F</u>													first 50 blows
No. of. SPT	:												REMA	RKS						
No. of. UDS	:																			
No. of. CR	:	1																		

Project: Soil investigation for construction of bridge over middle strait creek in the union territory of A&N Islands

Location : BARATANG Drillhole Record - BH-04

Bore Hole No : BH-04 Fig No. 07



Type of Boring : Rotary Drilling

Reduced Level : Y: 1344828.0990 Z: 1.035

 $\textbf{GEO FOUNDATIONS \&} \ \text{Water Level}: From \ G.L. \ Start \ \text{Date}: 04.04.2019 \ \text{Termination Depth}: 30.14 \ \text{m}: 06.04.2019 \ \text{Termination}: 10.04 \ \text{m}: 10.04$

STRUCTURES	C DV																		
JINOCIONES	, v									_			End D	ate			_		
SOIL DESCRIPTION	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEРТН (m)	TEST DEPTH(m)	15cm < 34	ALUE:	45cm % 0	SPT"N" Blows/300mm	T	SPT 'N'		Π	T.	C.R (%)	R.Q.D(%)	REMARKS G.W.L
	Soft Very Soft S	5		SPT-01 UDS-1 SPT-02 SPT-03	SS - SS	3.00	1.50-1.95	1 2 2	1 2 2	1 2 3	2		20	09	08	100		~	UDS Sample Collected
:	Medium	7.50		SPT-05 UDS-2	-	7.50	7.50-7.95	2	3	3	6	•							UDS Sample Collected
Silty CLAY		10.50		SPT-06	SS	9.00	9.00-9.45	2	4	4	8		MARKS						
Meofs PPSFandard Pene	etra:		SS-Soil S	ample,		С	S-Core Sampl	ie DS-	Distur	bed	soil	KE	WIARKS CR	-Core I	Keco	very	, RQD	-Rock	Quality Designation

Project: Soil investigation for construction of bridge over middle strait creek in the union territory of A&N Islands

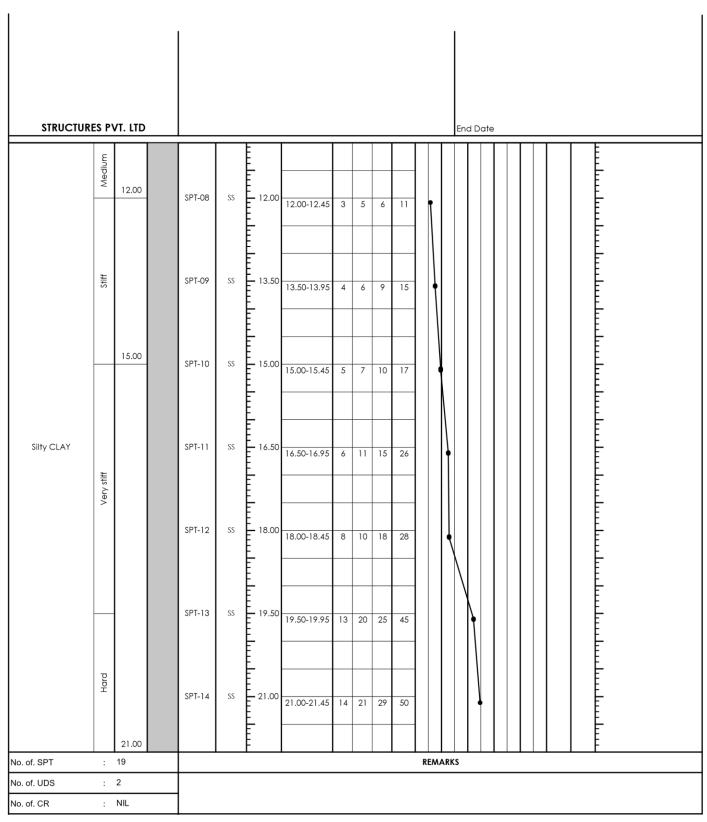
 Location
 : BARATANG
 Drillhole Record - BH-04

 Bore Hole No
 : BH-04
 Fig No. 07

 Type of Boring
 : Rotary Drilling
 Reduced Level
 : Y: 1344828.0990

 Z: 1.035
 Z: 1.035

GEO FOUNDATIONS & Water Level: From G.L. Start Date: 04.04.2019 Termination Depth: 30.14 m: 06.04.2019



Project: Soil investigation for construction of bridge over middle strait creek in the union territory of A&N Islands

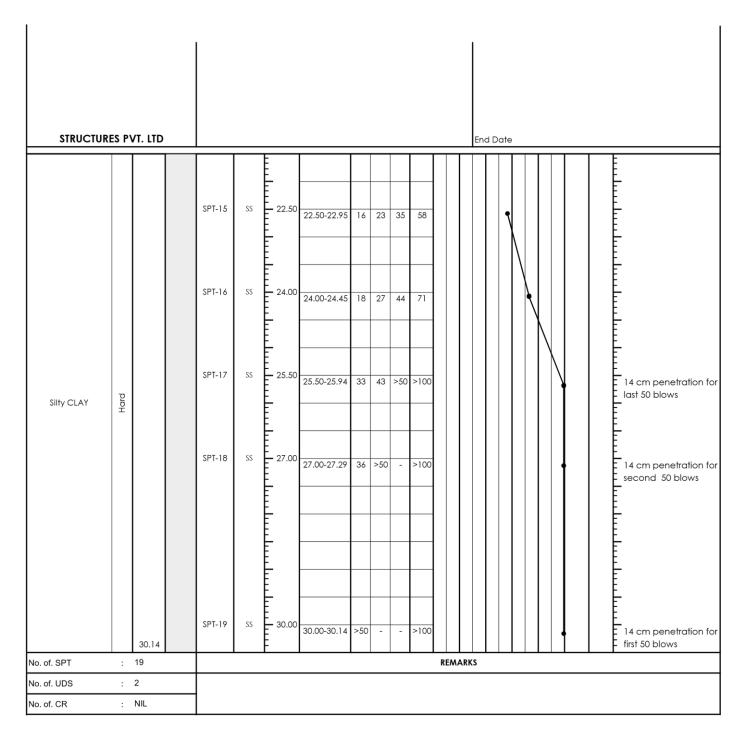
 Location
 : BARATANG
 Drillhole Record - BH-04

 Bore Hole No
 : BH-04
 Fig No. 07

 Type of Boring
 : Rotary Drilling
 Reduced Level
 : Y: 1344828.0990

 Z: 1.035
 Z: 1.035

GEO FOUNDATIONS & Water Level: From G.L. Start Date: 04.04.2019 Termination Depth: 30.14 m: 06.04.2019



No. of. CR

NIL

				Location			:	Baratar	ng								Drillh	ole Re	cord -	ВН-05
				Bore Hole	No		:	BH-05				,						Fig I	No. 08	
				Type of Bo	oring	Rotary	Drilling				Reduc	ed Le	evel		: '	Y: 134	4793.98	390		
GEO FOUND	DATI	ONS &		Water Lev	el el	From G	.L.			Start Date : 09.04.2019										
STRUCTURE	ES P\	/T. LTD		Terminati	on Dep	th	:	31.60	m				End D	ate			:	20.04.	2019	
OIL DESCRIPTION	URE	GROUND LEVEL (m)	Q	0	ETYPE	(m)	тезт DеРТН(m)		RATION	SPT"N" Blows/300mm			SPT 'N'	PROF	ILE			0	%)	REMARKS
	STRUCTURE	GROUN (m)	LEGEND	TEST NO	SAMPLE TYPE	DEРТН (m)	TEST DE	15cm	30cm 45cm	SP Blows,		70	40	09		8	100	C.R (%)	R.Q.D(%)	G.W.I
	Very soff			SPT-01	SS	1.50	1.50-1.95	1	1 1	2	•									
Sandy Silty CLAY				SPT-02 SPT-03		3.00	3.00-3.45		1 1	2	•									
	Soft			SPT-04	SS	6.00	6.00-6.45	1 :	2 2	4	•									
		7.50		SPT-05	SS	7.50	7.50-7.95	2	2 3	5	•									
Silty CLAY	Medium			SPT-06	SS	9.00	9.00-9.45	2	3 4	7	•									
		10.50		SPT-07	SS	10.50	10.50-10.95	3	3 4	7										

Project : Soil inves	tigatio	on for cons	truction of b	ridge (over mid	dle strait cr	eek i	n the	uni	on tei	rritor	y of	A&N Islands			
			Location			:	Barat	ang				,		Drillhole	Record - BH-05	
			Bore Hole	No		:	BH-05	j						F	ig No. 08	
			Type of Bo	oring		:	Rotar	y Drilli	ing				Reduced Level	: Y: 1	344793.9890	
GEO FOUN	IDAT	IONS &	Water Lev	/el		:	From	G.L.					Start Date	: 09.0	04.2019	
STRUCTUF	RES P	VT. LTD	Terminati	ion De	pth	:	31.6	-0 m					End Date	: 20.	04.2019	
					Ē										<u>E</u>	
			SPT-08	SS	12.00	12.00-12.45	3	3	4	7	•					
	Medium		SPT-09	SS	13.50	13.50-13.95	2	3	5	8	•					
			SPT-10	SS	15.00	15.00-15.45	3	3	5	8						
Silty CLAY			SPT-11	SS	16.50	16.50-16.95	6	7	11	18	\					
			SPT-12	SS	18.00	18.00 - 18.45	6	8	12	20						
	Very stiff		SPT-13	SS	19.50	19.50-19.95	7	8	11	19						
			SPT-14	SS	21.00	21.00-21.45	7	8	12	20						
		21.00			<u> </u>							\perp				
No. of. SPT	:	21									RE/	MARK	KS			
No. of. UDS		NIL														
No. of. CR	:	NIL														

oject : Soil inves	stigati	on for co	nstruction of b	ridge o	over mid	dle strait cr	eek i	n the u	nion t	erritor	y of A	&N Isl	ands						
			Location			:	Barat	ang				Drillhole Record - BH-05							
			Bore Hole	No No		:	BH-05								F	Fig No. 0	8		
			Type of B	oring		:	Rotar	y Drillin	9			Reduce	ed Leve	əl	: Y: 1	344793.	9890		
GEO FOUN	GEO FOUNDATIONS &			vel		: From G.L.							ite		: 09.04.2019				
STRUCTU	RES P	VT. LTD	Terminal	ion Dep	oth	:	31.6	0 m				End Da	ite		: 20.	.04.2019			
	Very stiff		SPT-15	SS	22.00	22.00-22.45	9	12 1	7 29										
		-	SPT-16	SS	24.00	24.00-24.45	11	18 2	0 38										
			SPT-17	SS	25.50	25.50-25.95	11	15 2	1 36										
Silty CLAY			SPT-18	SS	27.00	27.00-27.45	16	21 2	7 48										
	Hard		SPT-19	SS	28.50	28.50-28.92	19	29 >	50 >10	- D							12 cm penetration for last 50 blows		
			SPT-20	SS	30.00	30.00-30.25	42	>50	- >10								10 cm penetration for second 50 blows		
		31.60	SPT-21	SS	31.50	31.50-31.60	>50	-	- >10								10 cm penetration for first 50 blows		
lo. of. SPT		21								RE/	MARKS	.							
lo. of. UDS		NIL																	
o. of. CR	:	NIL																	

Project : Soil inves	tigati	on for c	onstru	ction of b	ridge (over mic	ldle strait cı	reek	in th	e un	ion te	rritory	of A	\&N	Islo	ınds							
				Location				: Bara	ıtang									Dril	lhole I	Record	d - BH-0	6	
				Bore Hole	e No		:	: BH-0	6										Fig	g No. ()9		
	_			Type of B	oring			: Rotc	ary Dri	lling				Redu	uced	d Lev	el e		: Y: 13 Z: 0.6	44759 6690	.8930		
GEO FOUN	IDAT	IONS 8		Water Level : From G.L.									Start Date : 16.04.2019										
STRUCTUR	ES P'			Terminati	ion Dep	oth	:	32.6	60 m				E	≣nd l	Date	e		:	: 19.0	4.2019			
SOIL DESCRIPTION	RE LEVEL				TYPE	(u	TH(m)		ETRAT		'N" 300mm		SI	SPT 'N' PROFILE								DEAL A DV	,
SOIL DESCRIPTION	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEРТН (m)	TEST DEPTH(m)	15cm	30cm	45cm	SPT"N" Blows/300mm		50	40		9	8	8	C.R (%)	R.Q.D(%)		REMARKS G.\	W.L
Silty CLAY	Very soff	3.00		SPT-01		1.50	1.50-1.95	1	1	1	2											=======================================	Ē
				SPT-02	SS	3.00	3.00-3.45	1	1	1	2												
Sandy Silty CLAY	Soft			SPT-04		4.50	4.50-4.95 6.00-6.45	1	2	2	3												
	E			SPT-05	SS	7.50	7.50-7.95	2	2	3	5	•											
Siity CLAY	Medium	9.00		SPT-06	SS	9.00	9.00-9.45	2	3	3	6	•											
		10.50		SPT-07	SS	10.50	10.50-10.95	2	2	4	6												
No. of. SPT		22										REM	ARKS										
No. of. UDS	:																						
NoteofSPR Standard P	enetr	a No n Tes	t SS-Soil	ample,		C	CS-Core Samp	ole DS	S-Distu	ırbea	soil			С	R-C	ore I	Reco	very	, RQ	D-Roc	k Qualit	y Designatio	n

ect : Soil inve	stigati	on for co	nstruction of b	ridge o	ver mid	ldle strait cr	eek	in the	e uni	on te	rritory	of A	&N Islands				
			Location				Bara							Dri	illhole Record - BH-06		
			Bore Hole				BH-0								Fig No. 09		
			Type of B	oring		:	: Rota	ry Dril	lling			F	Reduced Level	I	: Y: 1344759.8930 Z: 0.6690		
GEO FOUNDATIONS &			Water Le	vel		:	G.L.				S	Start Date		: 16.04.2019			
STRUCTUI	RES PY	VT. LTD	Terminat	on Dep	th	:	32.6	0 m				E	ind Date		: 19.04.2019		
			SPT-08	ss	12.00	12.00-12.45	4	5	5	10							
			SPT-09	ss	13.50	13.50-13.95	4	5	6	11							
	Stiff		SPT-10	SS	15.00	15.00-15.45	5	5	6	11							
Silty CLAY			SPT-11		16.50	16.50-16.95	5	5	6	11							
			SPT-12		18.00	18.00-18.45	5	6	7	13							
			SPT-13	SS	19.50	19.50-19.95	6	8	10	18							
	Very stiff	21.00	SPT-14	SS	21.00	21.00-21.45	8	8	11	19							
of. SPT		22									REM	ARKS					
of. UDS	:																
of. CR	:	NIL															

oject : Soil inve	stigat	ion for con	struction of b	ridge	over mic	ddle strait c	reek	in the	union	territo	ry of	A&N Is	lands			
			Location				: Bara	tang						D		ecord - BH-06
			Bore Hole	e No			: BH-0	5			_				Fig	No. 09
	=		Type of B	oring			: Rotary Drilling : From G.L.							el	: Y: 134 Z: 0.66	44759.8930 690
GEO FOU	NDA1	IONS &	Water Le	vel											: 16.04.2019	
STRUCTU	RES P	VT. LTD	Terminati	ion De	pth E	:	: 32.6	0 m				End Da	te T		: 19.04	.2019
	stiff		SPT-15	SS	22.50	22.50-22.95	8	10	11 21							
	Very stiff		SPT-16	SS	24.00	24.00-24.45	8	11	14 25	5						
		-	SPT-17	SS	25.50	25.50-25.95	27	33 4	47 80							
Silty CLAY			SPT-18	SS	27.00	27.00-27.42	33	48 >	50 >10	00						12 cm penetration
	Hard		SPT-19	SS	28.50	28.50-28.90	35	49 >	50 >10	00						10 cm penetration
			SPT-20	SS	30.00	30.00-30.29	35	>50	- >10	00						14 cm penetration
			SPT-21	SS	31.00	31.00-31.27	47	>50	- >10	00						12 cm penetrations second 50 blows
		32.60	SPT-22	SS	32.50	32.50-32.60	>50	-	- >10	00						10 cm penetration
o. of. SPT	:	22								RE	MARKS	3				
. of. UDS	:	2														
o. of. CR	:	NIL														
		AND TOOLS														

Location : P-1 location Drillhole Record -MBH-01

Project :Sub soil investigation for construction of bridge over Middle Strait creek Fig No. 11

Project :Sub soil invest							iddle Strait		k in t	he l	Jnion	Terri	tory	of A	A&N	Isla	nds					
			_	Locatio	n		:	A-1 l	ocati	ion								Dril			ord -	- LBH-07
		_	ı	Bore Ho			:	7						Re	duce	ed Le	evel		: X: 4	735	502.70 521.1	061
GEO FOUNDATION	IS & ST	RUCTU	IRES	Type of Water T		9	:		ry Dri m fro		31			Sto	art Do	ate			Z: 1 : 25.0	.062	20	
PVT.				Termino		epth	:	27.04		//// E					d Da				: 30.0			
SOIL DESCRIPTION	32	LEVEL			YPE	OM	H (m)		ETRAT /ALUE		SPT"N" Blows/300mm			SPT	'N' P	ROFI	LE					
	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLETYPE	DEPTH FROM GROUND LEVEL (m)	теѕт DеРтн (m)	15cm	30cm	45cm	SP' Blows/		70	Ę	9	09	8	5	C.R.(%)		R.Q.D(%)	
Sandy Clayey SILT	Very Stiff	3.00		SPT-01	ss	1.50	1.50-1.95	6	10	13	23		\									
Clayey SILT	Hard	4.50		SPT-02	SS	3.00	3.00-3.45	12	18	24	42											
Gravelly Clayey SILT	Hard	6.00		SPT-04	SS	4.50	4.50-4.95	14	21	27	48				•							
Sandy Silty CLAY	Hard			SPT-05	SS	7.50	7.50-7.57	>50		-	>100											7 cm penetration for for first 50 blows 7 cm penetration for first 50 blows G.W.L.
		9.00		SPT-06	SS	9.00	9.00-9.11	>50	-	-	>100											11 cm penetration for first 50 blows
Gravelly Clayey SILT	Hard			SPT-07	SS	10.50	10.50-10.62	>50	-	-	>100											12 cm penetration for first 50 blows
				SPT-08	SS	12.00	12.00-12.28	26	>50	-	>100											13 cm penetration for second 50 blows
Sandy Clayey SILT No. of, SPT	: Hard	13.50		SPT-09	SS	13.50	13.50-13.79	42	>50	-	>100		MAR	eks								14 cm penetration for second 50 blows
No. of. UDS	:	NIL																				
No. of. CR	:	NIL																				

Fig No. 11

Location : P-1 location Drillhole Record - MBH-01

Project :Sub soil investigation for construction of bridge over Middle Strait creek

Project :Sub soil invest							iddle Strait		k in t	he l	Jnion	Territ	ory	of A8	kN Is	lan	ds				
				Locatio	n		:	A-1 l	ocati	on								Drill		No. 1	- LBH-07
	7	_	1	Bore Ho	ole No		:	7						Redu	ıced	Lev	el	:	X: 473	3502.7	061
			J	Type of		g	:	Rota											Y:134 Z: 1.0	520	239
GEO FOUNDATION PVT. I		RUCTU	IRES	Water I Termina		epth)	:	8.40 27.0		m EC	GL		- 1	Start End [25.04 30.04		
				101111111									_								
		GROUND LEVEL (m)			۳ ا	DEPTH FROM GROUND LEVEL (m)	Ē		ETRAT 'ALUE		SPT"N" Blows/300mm		5	SPT 'N'	PRC	FILE					
SOIL DESCRIPTION	STRUCTURE	N I	9	9	Ţ.	I FRO	ГЕЅТ DEРТН (m)				SPT"! ws/30	Т			Т	Т		Т	<u>©</u>	(%)	
	STRUC	GRO (m)	LEGEND	TEST NO	SAMPLE TYPE	GROL (m)	l EST	15cm	30cm	45cm	Blo		8	64	,	,	80	8	C.R (%)	R.Q.D(%)	
Sandy Clayey SILT	Hard	18.00		SPT-10	SS	15.00	15.00-15.12 16.50-16.61	>50		-	>100										12 cm penetration for first 50 blows 11 cm penetration for first 50 blows
Clayey SILT	Hard	19.50		SPT-13	SS	19.50	19.50-19.58	>50	-	-	>100								,		first 50 blows 8 cm penetration for first 50 blows
Silty CLAY	Hard	22.50		SPT-14	SS	21.00	21.00-21.07	>50	-	-	>100								,	•	7 cm penetration for first 50 blows
Sandy Silty CLAY	Hard	22.50		SPT-15		22.50	22.30*22.33			-	>100										5 cm penetration for first 50 blows
Silty CLAY	Hard			SPT-17		25.50	24.00-24.04		-	-	>100										04 cm penetration for first 50 blows
Sily 5641	¥	27.04		SPT-18	SS	27.00	27.00-27.04	>50	-	-	>100										first 50 blows 4 cm penetration for first 50 blows
No. of. SPT	:	18										REA	MARI	(S							
No. of. UDS	:	NIL																			
No. of. CR	:	NIL																			



Bore Hole No Type of Boring Water Table

of Boring : Rotary Drilling
1.20 mtr from Sea bed

: level

: 1- Marine

Reduced Level

Start Date

: 473556.4771 1344546.5148

: 08.05.2019

PVT. LTD Termination Depth : 30.09 m End Date : 12.05.2019 PENETRATION GROUND LEVEL (m) DEPTH FROM GROUND LEVEL (m) SPT 'N' PROFILE теѕт рертн (m) VALUES SAMPLE TYPE SOIL DESCRIPTION STRUCTURE R.Q.D(%) LEGEND TEST NO C.R (%) 30cm 45cm 15cm 8 20 8 SPT-01 SS 1.50 1.50-1.95 10 18 26 44 UDS-01 DS 2.00 **UDS Slipped** Silty SAND SPT-02 SS 3.00-3.45 12 | 15 | 18 33 4.50 SPT-03 SS 4.50-4.60 10 cm penetration for first 50 >50 ->100 blows SS SPT-04 6.00 6.00-6.09 9 cm penetration for first 50 >50 >100 blows SPT-05 SS 7.50-7.76 11 cm penetration for second 50 32 >50 >100 blows SPT-06 SS 9.00 9.00-9.45 18 28 30 Weathered Rock SPT-07 SS - 10.50 5 cm penetration for second 50 10.50-10.70 42 >50 ->100 blows SPT-08 SS 12.00 12.00-12.05 >50 -5 cm penetration for first 50 blows SPT-09 SS **-** 13.50 13.50-13.64 14 cm penetration for first 50 >50 >100 blows : 20 REMARKS No. of. SPT No. of. UDS : 1 : NIL No. of. CR

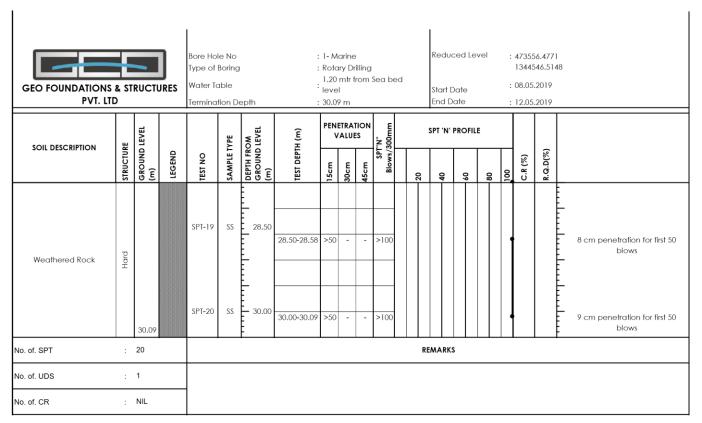
No. of. CR

: NIL

Project :Sub soil investigation for construction of bridge over Middle Strait creek in the Union Territory of A&N Islands : P-1 location Fig No. 11 : 1- Marine Reduced Level : 473556.4771 Bore Hole No 1344546.5148 : Rotary Drilling Type of Boring 1.20 mtr from Sea bed : 08.05.2019 Water Table level **GEO FOUNDATIONS & STRUCTURES** Start Date PVT. LTD 30.09 m End Date : 12.05.2019 Termination Depth PENETRATION DEPTH FROM GROUND LEVEL Blows/300mm SPT 'N' PROFILE GROUND LEVEL TEST DEPTH (m) **VALUES** SAMPLE TYPE SOIL DESCRIPTION STRUCTURE 8.Q.D(%) TEST NO C.R (%) 5cm Ê 8 20 8 SPT-10 SS 15.00 15.00-15.10 >50 10 cm penetration for first 50 >100 blows SPT-11 SS 16.50 16.50-16.57 >50 >100 7 cm penetration for first 50 blows SPT-12 SS - 18.00 18.00-18.10 10 cm penetration for first 50 >50 blows SPT-13 SS 20.00-20.06 >50 -6 cm penetration for first 50 >100 blows Weathered Rock SPT-14 SS 21.00 21.00-21.07 >50 >100 7 cm penetration for first 50 blows SPT-15 SS 22.50 22.50-22.58 >50 >100 8 cm penetration for first 50 blows SPT-16 SS 24.00 24.00-24.09 >50 09 cm penetration for first 50 blows SPT-17 SS 25.50 25.50-25.60 >50 10 cm penetration for first 50 blows SPT-18 SS 27.00 27.00-27.07 >50 7 cm penetration for first 50 blows 27.00 : 20 No. of. SPT REMARKS No. of. UDS : 1

Project :Sub soil investigation for construction of bridge over Middle Strait creek in the Union Territory of A&N Islands

	Location	: P-5 location	Drilli	hole Record - MBH-02
	Bore Hole No	: 2-Marine		Fig No. 12
	Type of Boring Ses Bed Level Termination Depth	: Rotary Drilling : (-) 15.18 m from C.D.	Reduced Level	: 473873.1253 1344695.6705
GEO FOUNDATIONS & STRUCTURES PVT. LTD	тетпіпаноп рертп		Start Date SET, NORGERILE VALUES	: 20.02.2020 5 : 28.02.2020



Project :Sub soil investigation for construction of bridge over Middle Strait creek in the Union Territory of A&N Islands

Location

: P-1 location

Drillhole Record -MBH-01

Fig No. 11

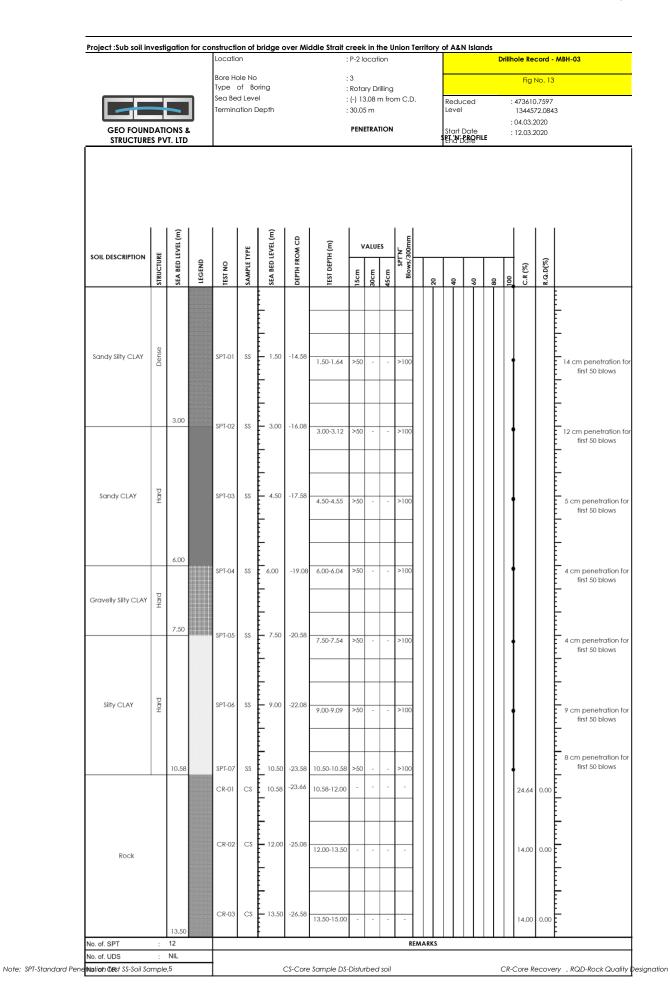
Project :Sub soil investigation for construction of bridge over Middle Strait creek in the Union Territory of A&N Islands

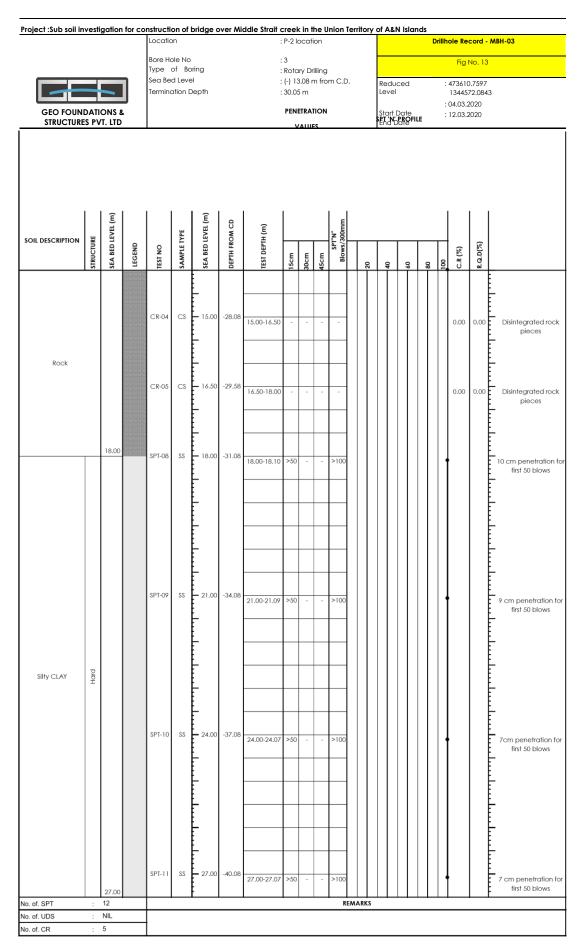
: P-5 location Drillhole Record - MBH-02 Location Fig No. 12 Bore Hole No : 2-Marine Type of Boring : Rotary Drilling : 473873.1253 1344695.6705 Reduced Level Ses Bed Level : (-) 15.18 m from C.D. Termination Depth : 30 PENETRATION Start Date : 20.02.2020 PhiNiprofile VALUES : 28.02.2020 GEO FOUNDATIONS & STRUCTURES PVT. LTD SEA BED LEVEL (m) SEA BED LEVEL (m) rest DEPTH (m) SAMPLE TYPE STRUCTURE SOIL DESCRIPTION TEST NO C.R (%) Sandy CLAY SPT-01 SS 1.50 -16.68 1.50-1.95 0 3.00 SPT-02 3.00 SS -18.18 3.00 - 3.45 SPT-03 SS -19.68 4.50 4.50-4.95 soff SPT-04 SS 6.00 -21.18 6.00-6.45 4 7.50 SS -22.68 7.50-7.95 Stiff Sandy Silty CLAY 9.00 SPT-06 SS 9.00-9.45 10 21 Very Stiff 10.50 SPT-07 SS 10.50 10.50-10.95 Very Stiff 12.00 SPT-08 SS 12.00 12.00 - 12.45 24 STIFF 13.50s-66fe sanggle ps-pjiturpea so Note: SPT-Standard Penetration Test SS-Soil Sample, SPT-09 SS QD-Rock Quality Designation No. of. SPT 18 REMARKS No. of. UDS NIL

	Location	: P-5 location	D	rillhole Record - MBH-02
	Bore Hole No	: 2-Marine		Fig No. 12
	Type of Boring Ses Bed Level Termination Depth	: Rotary Drilling : (-) 15.18 m from C.D.	Reduced Level	: 473873.1253 1344695.6705
GEO FOUNDATIONS &	Termination Depth	: 39.04 m	Start Date	: 20.02.2020
STRUCTURES PVT. LTD			End Date	: 28.02.2020

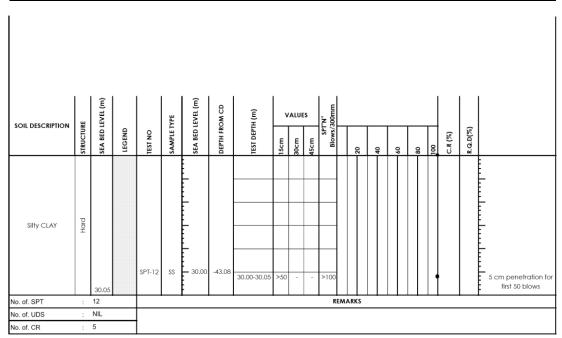
SOIL DESC	RIPTION A	SEA RED LEVEI (m)	LEGEND	TEST NO	SAMPLE TYPE	SEA BED LEVEL (m)	DEPTH FROM CD	теѕт DеРтН (m)	15cm	30cm	SPT"N" Blows/300mm	20	- 40	09	-80	100	C.R (%)	R.Q.D(%)	
	Very Stiff			ı															
		15.	00	SPT-10	SS	15.00	-30.18	15.00-15.04	>50	-	- >100					•	•		4 cm penetrati for first 50 blov
				ı	1 1														
				SPT-11		18.00	-33.18	18.00-18.04	>50		- >100								4 cm penetrati
				ı															for first 50 blov
Sandy Silt	y CLAY			ı		lll.													
	Hord			SPT-12	SS	21.00	-36.18	21.00-21.12	>50	-	- >100						•		12 cm penetral for first 50 blov
				ı															
				SPT-13	SS	24.00	-39.18	24.00-24.13	>50		- >100								13 cm penetrat
				ı				24.00 24.10											for first 50 blov

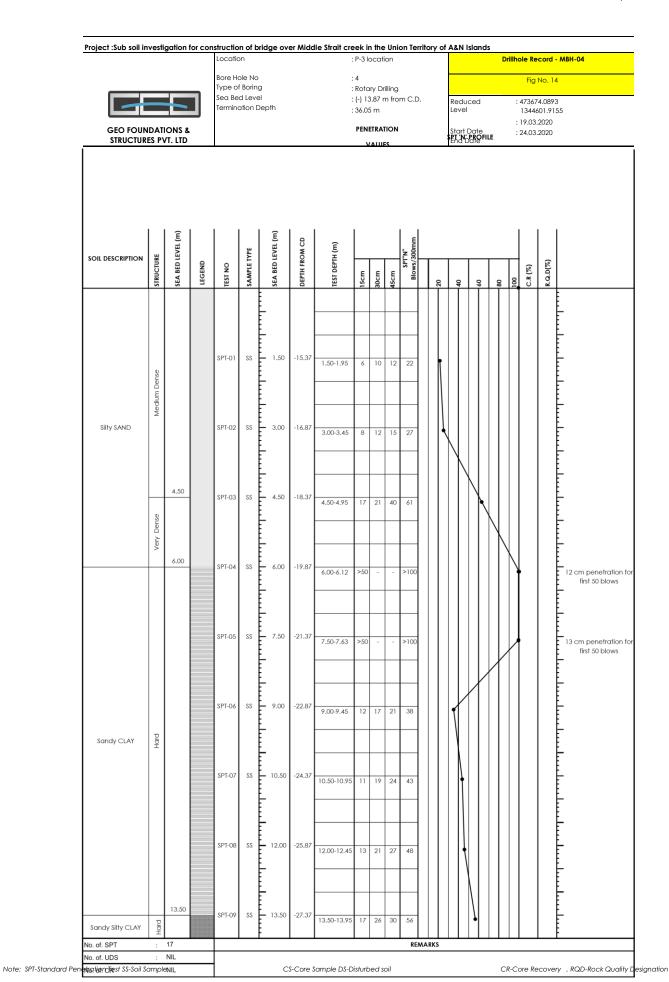
				Locatio						catio	n			}	_			Drilli		No. 12		
GEO FOUND	ATI	ONS ®		Bore Ho Type of Ses Bed Termina	Boring Level			:	2-Ma Rota (-) 15 39.04	ry Dril i.18 m		n C.D.				ıced L Date	.evel		: 4738 134	73.125 1695.67 2.2020	3	
STRUCTURES										ETRAT					End (2.2020		
										LINA				S	PT 'N'	PROF	ILE V	ALUES				
OIL DESCRIPTION	STRUCTURE	SEA BED LEVEL (m)	LEGEND	TEST NO	SAMPLETYPE	SEA BED LEVEL (m)	DEPTH FROM CD	тезт Dертн (т)	15cm	30cm	45cm	SPT"N" Blows/300mm	<u>Г</u>	20	40	9		20 60	C.R (%)	R.Q.D(%)		
	S	25	_	=	S	: 2	۵	μ	15	30	45		+	Ĭ	1	1 1	1 6	5 5	21 0	~	:	
				SPT-15	SS	30.00	-45.18	30.00-30.10	>50	-		>100							•		10 cm pene for first 50 b	
Sandy Silty CLAY	Hard			SPT-16	ss	33.00	-48.18	33.00-33.06	>50	-		>100									6 cm penet for first 50 b	
				SPT-17	SS	36.00	-51.18	36.00-36.04	>50	-	-	>100							•		4 cm penet for first 50 b	
				SPT-18	SS	39.00	-54.18	39.00-39.04	>50	-	-	>100							•		4 cm penel	

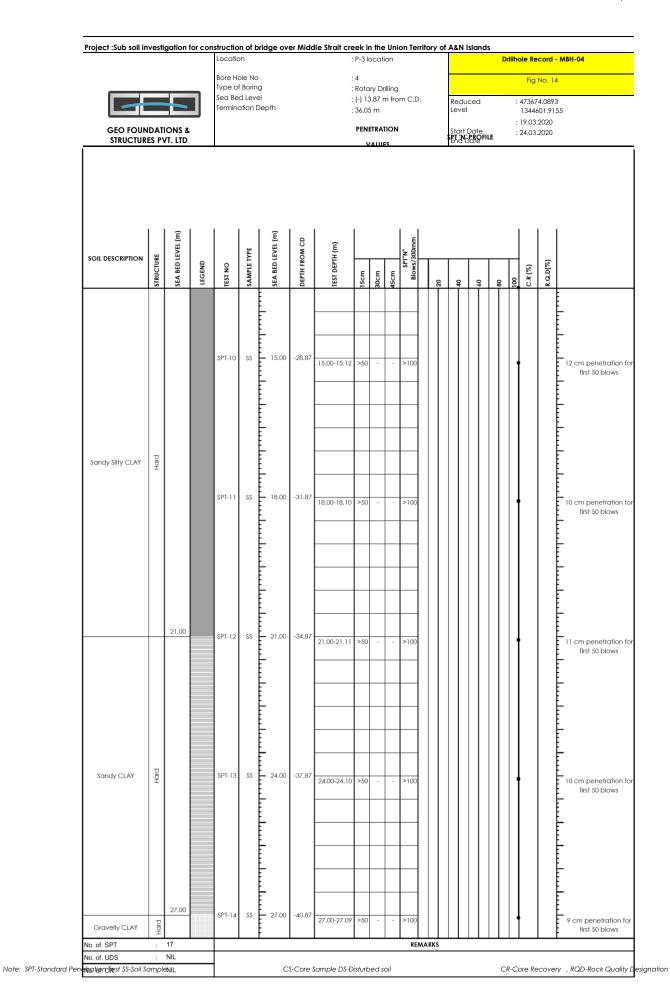


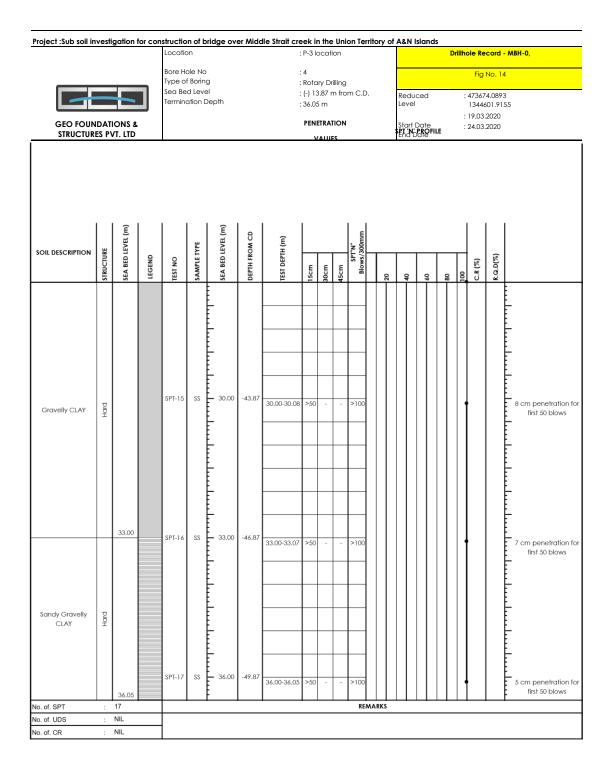


Project :Sub soil investigation for a	onstruction of bridge over M	iddle Strait creek in the Union Territor	ry of A&N Islands	
	Location	: P-2 location		Drillhole Record - MBH-03
	Bore Hole No Type of Boring	: 3 : Rotary Drilling		Fig No. 13
	Sea Bed Level Termination Depth	: (-) 13.08 m from C.D. : 30.05 m	Reduced Level	: 473610.7597 1344572.0843
GEO FOUNDATIONS & STRUCTURES PVT. LTD		PENETRATION	Start Date SEL'N'PROFILE	: 04.03.2020 : 12.03.2020







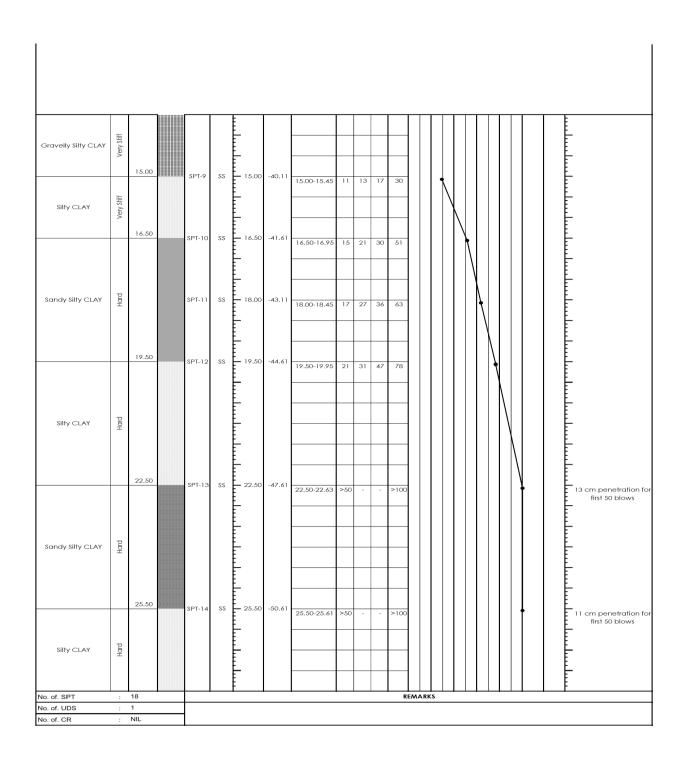


Project :Sub soil investigation for construction of bridge over Middle Strait creek in the Union Territory of A&N Islands Location Drillhole Record - MBH-05 : P-4 Location Fig No. 15 Bore Hole No : 5 Type of Boring : Rotary Drilling : 473773.6073 1344648.7930 Reduced Level Sea Bed Level : (-)25.11 m from C.D. Termination Depth : 37.60 m : 04.05.2020 **GEO FOUNDATIONS &** Start Date : 09.05.2020 End Date STRUCTURES PVT. LTD

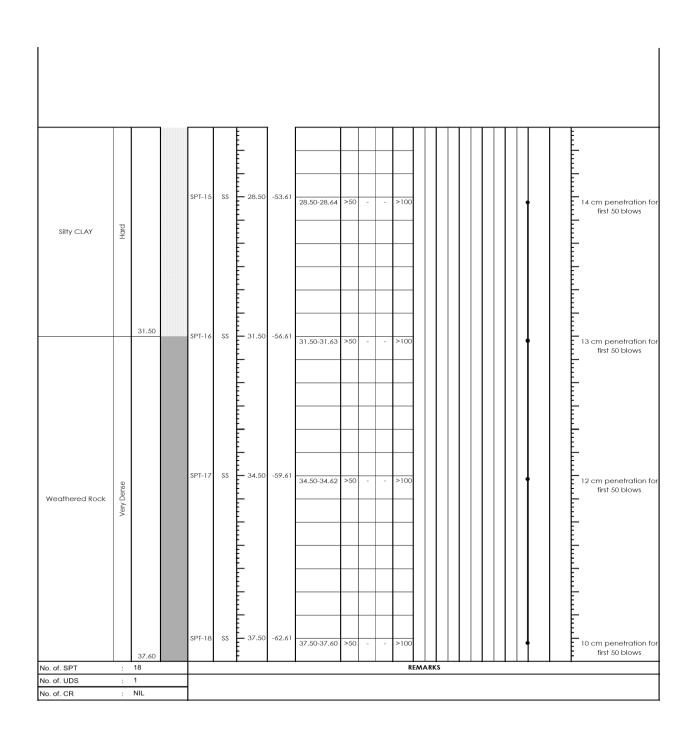
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SPT 'N' PROFILE VALUES SEA BED LEVEL (m) DEPTH FROM CD TEST DEPTH (m) SOIL DESCRIPTION STRUCTURE LEGEND TEST NO SS 1.50 -26.61 1.50-1.95 0 0 Very Soft SS -28.11 3.00-3.45 0 Sandy CLAY SPT-3 SS 4.50 -29.61 4.50-4.95 0 0 6.00 SPT-4 SS -31.11 6.00 6.00-6.45 Soff 7.50 SPT-5 SS 7.50 -32.61 7.50-7.95 2 Medium Stiff Sandy Silty CLAY SS 9.00-9.45 2 10.50 SPT-7 SS 10.50-10.95 Stiff Silty CLAY UDS-01 -37.11 UDS Sample Collected Very Stiff 13.50 SPT-8 SS 13.50 -38.61 13.50-13.95 Gravelly Silty CLAY No. of. SPT 18 REMARKS No. of. UDS Note: SPT-Standard Pene nation Test SS-Soil Sample, NIL CS-Core Sample DS-Disturbed soil CR-Core Recovery , RQD-Rock Quality Designation

Location	: P-3 location	Drillhole Record - MBH-0,
Bore Hole No Type of Boring	: 4 : Rotary Drilling	Fig No. 14
Sea Bed Level Termination Depth	: (-) 13.87 m from C.D. : 36.05 m	Reduced : 473674.0893 Level 1344601.9155
FOUNDATIONS &	PENETRATION	: 19.03.2020 Start Date : 24.03.2020



Project :Sub soil investigation for con	struction of bridge over Middle Strait	दग् टक् kुंख्युंश्लिम्∥nion Territory o	Dri	illhole Record - MBH-05
	Bore Hole No Type of Boring	: 5 : Rotary Drilling		Fig No. 15
	Sea Bed Level Termination Depth	: (-)25.11 m from C.D. : 37.60 m	Reduced Level	: 473773.6073 1344648.7930 : 04.05.2020
GEO FOUNDATIONS & STRUCTURES PVT. LTD			Start Date End Date	: 09.05.2020



<u>APPENDIX II</u>

LABORATORY TEST RESULTS

											date & En 2019 - 20.			Terr	minatio		th		Table No.
	TEST RESU	2111	Project: Sub soil investig						er	C	Coordinat	es		,	Water '	Table			Bore Hole No
	TEST RESC		Middle Strait creek in the	e union ter	ritory	of A&I	N Islan	ds			474009.28 344776.9 Z:0.6690	460			From	G.L.			6
			SOIL DESCRIPTION		GR	AIN SIZE	ANALYSIS			AT	TERBERG LI <i>i</i>	WITS							SHEAR PARAMETERS
Z > AL UE	D EP TH ft s	SA M PL E		IS C LA SSI FI C AT IO N	G R A VE L,	SA N D, (c o ar se	SA N D (m e di u m	SA N D (fi ne), %	SIL T A N D C LA Y	LI Q UI D LI MI T	PL AS TI C LI MI T	PL AS TI C IN D EX %	SH RI N K A G E LI MI	FIE LD M OI ST U RE C O NT E NT	D RY D E NS ITY , g m /c	W ET D E NS ITY , g m	SP E CI FI C G R A VI TY O F	FR EE S W EL II N G IN D EX	TE ST M ET H O
2	1.50	SPT-1	SILTY CLAY	CI	1	0	1	7	91	36	23	13		43.00				45.45	
2	3.00	SPT-2	SANDY SILTY CLAY	CI	0	10	1	11	78	40	22	18		42.61			2.620		
3	4.50	SPT-3	SANDY SILTY CLAY	CI	0	0	6	12	82	46	25	21		39.98					
4	6.00	SPT-4	SANDY SILTY CLAY	CI	1	1	8	14	76	42	23	19		40.12					
5	7.50	SPT-5	SANDY SILTY CLAY	CI	0	1	10	12	77	45	26	19		39.99					
6	9.00	SPT-6	SILTY CLAY	CI	1	1	1	5	92	48	25	23		39.80				30.00	
6	10.50	SPT-7	SILTY CLAY	СН	0	1	1	4	94	52	27	25		33.03					
10	12.00	SPT-8	SILTY CLAY	СН	1	2	7	1	89	56	28	28		2914					
11	13.50	SPT-9	SILTY CLAY	СН	0	0	0	7	93	53	26	27		29.37					
11	15.00	SPT-10	SILTY CLAY	СН	1	1	1	1	96	52	26	26		24.16				33.33	
11	16.50	SPT-11	SILTY CLAY	СН	0	0	7	1	92	57	28	29		26.37				81.82	
13	18.00	SPT-12	SILTY CLAY	СН	1	1	1	1	96	59	30	29		26.66				53.85	
18	19.50	SPT-13	SILTY CLAY	СН	1	1	1	7	90	55	28	27		22.09				90.91	
19	21.00	SPT-14	SILTY CLAY	СН	2	4	8	6	80	53	27	26		21.26			2.480		
21	22.50	SPT-15	SILTY CLAY	СН	5	0	1	3	91	56	28	28		23.02					
25	24.00	SPT-16	SILTY CLAY	СН	3	1	2	4	90	58	29	29		21.02					
80	25.50	SPT-17	SILTY CLAY	СН	1	1	1	4	93	59	29	30		18.00					

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>100	27.00	SPT-18	SILTY CLAY***	 2	3	4	2	89	SAMPLE SHORT	 17.16	 	 70.00	
>100	28.50	SPT-19	SILTY CLAY***	 3	5	1	2	89	SAMPLE SHORT	 8.07	 	 80.00	
>100	30.00	SPT-20	SILTY CLAY***	 1	1	2	1	95	Sample Short	 13.15	 	 	
>100	31.00	SPT-21	SILTY CLAY***	 2	1	2	1	94	SAMPLE SHORT	 14.20	 	 50.00	
>100	32.50	SPT-22	SILTY CLAY***	 1	1	3	2	93	SAMPLE SHORT	 16.40	 	 	

NOTE ***

SOIL DESCRIPTION BASED ON VISUAL IDENTIFICATION

									57	25.04		& End date -30.04.2019		Te		natio 27.04	n De M	_' th		Table 7	No.
	TEST	LTS	Project: Sub soil inv	estig	ation t	or cor	nstructi	on of	bridge		Coord	inates			W	ater 1	able			Bore H	ole No
	RESU		Middle Strait creek i	n the	union	territo	ry of A	&N Islo	ands			02.7061 21.1539 0620		8	3.40 r	mtr fr	om G	L.		7	
			SOIL		(GRAIN S	IZE ANA	LYSIS		AT	TERBER	G LIMITS	SH	FIE	D	W	SP	FR	SHE	AR PARA	METERS
N V AL UE	D EP TH ,m trs	SA M PL E	DESCRIPTION	IS C LA SSI FI C AT IO N	G R A VE L,	SA N D, (c o ar se)	SA ND(medium	SA ND (fi ne)	SIL T A N D C LA Y	LI Q UI D LI M	PL AS TI C LI MI T	PL AS TI C IN D EX %	RI N K A G E LI MI	LD M OI ST U RE C O NT E NT , ""	RYDENSITY, 9 m/c	D E NS	E CI FI C G R A VI TY O F .	EE S W EL LI N G IN D EX	TE ST M ET H O	С o he sio n, c in к g/ c	ANGLEOFSHEARINGRESISTAN
23	1.50	SPT-1	Sandy Clayey Silt	ML	2	5	3	2	88	33	22	11		30.72				10	_		
42	3.00	SPT-2	Clayey Silt	MI	1	2	1	0	96	39	25	14		18.96							
48	4.50	SPT-3	Gravelly Clayey Silt	MI	23	1	4	3	69	36	23	13		15.95				10			
>100	6.00	SPT-4	Sandy Silty Clay	-	0	0	0	16	84		NO	ΓE-1		18.25				20			
>100	7.50	SPT-5	Sandy Silty Clay	-	0	0	0	12	88		NO	ΓE-1		17.05							
>100	9.00	SPT-6	Gravelly Clayey Silt	ML	16	0	5	1	78	31	22	9		18.31				10			
>100	10.50	SPT-7	Gravelly Clayey Silt	ML	28	0	4	1	67	34	22	12		17.34				10			
>100	12.00	SPT-8	Gravelly Clayey Silt	ML	12	0	3	2	83	31	24	7		17.30				10			
>100	13.50	SPT-9	Sandy Clayey Silt		0	0	0	47	53		NO	ΓE-1		15.58				20			
>100	15.00	SPT-10	Sandy Clayey Silt	MI	9	0	9	4	78	37	28	9		17.64				10			
>100	16.50	SPT-11	Sandy Clayey Silt	-	6	2	4	14	74		NO	ΓE-1		15.49				10			-
>100	18.00	SPT-12	Clayey Silt	MI	2	1	1	0	96	37	25	12		16.16				20			
>100	19.50	SPT-13	Silty Clay	-	2	1	3	1	93		NO	ΓE-1		16.77				20			

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>100	21.00	SPT-14	Silty Clay	-	4	0	0	0	96	NOTE-1	16.61		25		
>100	22.50	SPT-15	Sandy Silty Clay	-	0	0	0	20	80	NOTE-1	15.22		10		
>100	24.00	SPT-16	Silty Clay	-	0	0	0	3	97	NOTE-1	15.23		10		
>100	25.50	SPT-17	Silty Clay	-	0	0	0	5	95	NOTE-1	15.01				
>100	27.00	SPT-18	Silty Clay	-	0	0	0	9	91	NOTE-1	14.03		10		

NOTE -1

N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS

												59									
										ı	tart date & l			Te		natio		pth	T	able N	lo.
										08.	05.2019 - 1					0.09				8	
			Project: Sub soil ir	vestig	ation	for c	onstr	uction	of		COORDI	NATES			Wo	ater T	able	;	Bor	e Hole	: No
	TEST RESU	LTS	bridge over Midd territory of A&N Is		t cree	ek in 1	the u	nion			X: 473556 Y: 1344546 Z: 1.06	5.5148		1.20 m	tr fro	m Se	ea be	ed Level	,	MBH-0	1
			SOIL		GRA	IN SIZ	EAN	ALYSI	S	,	ATTERBERG	LIMITS		86					SHEAR	PARA	METERS
			DESCRIPTION											ZTENT,			F SOIL	%, %		n²	3 RESI
N VALUE	DEPTH, mtrs	SAMPLE		is classification	GRAVEL, %	SAND, (coarse) %	SAND (medium), %	SAND (fine), %	SILT AND CLAY %	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTIC INDEX %	SHRINKAGE LIMIT, %	FIELD MOISTURE CONTENT,	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	SPECIFIC GRAVITY OF	FREE SWELLING INDEX,	TEST METHOD	Cohesion,c in Kg/cm²	angle of shearing resi
												_	0,		 	_	0,				
44	1.50	SPT-1		SM	0	0	6	51	43		NON PLA	ASTIC		27.51				NO SWELL			
-	2.00	UDS-1	Silty Sand			-						UDS	SLIP		_						
33	3.00	SPT-2	1	SM	0	0	4	60	36		NON PLA	ASTIC		20.66							
>100	4.50	SPT-3																			
>100	6.00	SPT-4	1																		
>100	7.50	SPT-5	1																		
>100	9.00	SPT-6	1																		
>100	10.50	SPT-7	1																		
>100	12.00	SPT-8	1												\vdash						
>100	13.50	SPT-9	1																		
>100	15.00	SPT-10	1																		
>100	16.50	SPT-11	Weathered Rock																		
>100	18.00	SPT-12	1																		
>100	20.00	SPT-13]																		
>100	21.00	SPT-14]																		
>100	22.50	SPT-15]																		
>100	24.00	SPT-16]																		
>100	25.50	SPT-17]																		
>100	27.00	SPT-18]																		
>100	28.50	SPT-19]																		
>100	30.00	SPT-20																			

NOTE -1 N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS

										date	date & Er .20 - 28			Ter	minatio	n Dept mtr	h			Table 9	No.
1	EST RESU	JLTS	Project: Sub soil i over						_		ORDIN/			S	ea Bec	l Level				Bore Ho	ole No
			Middle Strait cree	ek in the	union	territor	y of A&	N Island	ds		73873.1: 44695.6			(-) 1	5.18 m	from C.	D.			МВН	-02
			SOIL DESCRIPTION		GI	RAIN SIZ	ZE ANA	LYSIS		ATTE	RBERG I	IMITS		FIE	D	W	SP	FR	SHEAI	R PARA/	
N V AL UE	DE PT H, mt rs	SA M PL E	DESCRIPTION	IS CL AS SIF IC AT IO N	G R A VE L,	SA ND, (co arse) %	SA ND(medium	SA ND (fi ne), %	SIL T A N D CL A Y &	LI Q UI D LI MI T	PL AS TI C LI MI T	PL AS TI C IN DE X %	SH RI N K A G E LI M T	LD M OI ST UR E C O NT EN T, %	RY DE NS IT, g m < c	ET DE NS ITY , g m /c c	E CI FI C G R A VI Y O F S	EE S W EL II N G IN DE X, %	TE ST M ET H O	Cohesion cinkg cm²	A N G LE O F SH EA RI N G RE SIS TA N C E
0	1.50	SPT-1	Sandy Clay	CI	0	1	8	14	77	44	24	20		41.25							
-	3.00	UDS-1	Sandy Silty Clay	CI	0	1	10	18	71	41	23	18		40.05	1.00	1.400					
2	4.50	SPT-2	Sandy Silty Clay	CI	1	1	11	22	65	42	23	19		40.29							
4	6.00	SPT-3	Sandy Silty Clay	CI	1	1	12	28	58	41	28	13		40.27				60			
9	7.50	SPT-4	Sandy Silty Clay	Cl	1	1	8	30	60	42	32	10		38.98				50			
21	9.00	SPT-5	Sandy Silty Clay	CI	6	1	10	32	51	43	20	23		38.00							
21	10.50	SPT-6	Sandy Silty Clay	Cl	1	1	12	18	68	40	23	17		38.25				60			

-	12.00	UDS-2	Sandy Silty Clay	Cl	1	1	7	14	77	43	24	19		25.33	1.37	1.7			
30	13.50	SPT-7	Sandy Silty Clay	CI	0	1	8	12	79	41	23	18		22.56			20		
>100	15.00	SPT-8	Sandy Silty Clay	-	1	2	12	24	61		NOTE-01			15.46					
>100	18.00	SPT-9	Sandy Silty Clay	-	1	2	10	22	65	1	NOTE-01			15.21			30		
>100	21.00	SPT-10	Sandy Silty Clay	-	1	2	14	24	59	-	NOTE-01			15.01					
>100	24.00	SPT-11	Sandy Silty Clay	-	1	3	10	20	66	1	NOTE-01			14.56					
>100	27.00	SPT-12	Sandy Silty Clay	-	1	1	11	18	69	1	NOTE-01			14.89					
>100	30.00	SPT-13	Sandy Silty Clay	-	1	1	15	18	65	ı	NOTE-01			14.66					
>100	33.00	SPT-14	Sandy Silty Clay	-	0	1	12	20	67	ı	NOTE-01			14.53					
>100	36.00	SPT-15	Sandy Silty Clay	-	0	3	10	21	66	ı	NOTE-01			14.09					
>100	39.00	SPT-16	Sandy Silty Clay	-	0	5	9	17	69		NOTE-01		CIENT FO	13.02					

NOTE -1 N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS

			Project: Sub soil inve	estig	ation	for co	onstru	uction	of		date & 1 .03.20 - 12	End date 2.03.20		Terr		tion I .05 <i>N</i>	Dept 1	h		Table 1	No.
	TEST RESU	LTS	bridge over Middle	Strai						C	COORDIN	IATES		Se	а Ве	ed L	evel		Во	ore Hole	e No
			territory of A&N Islar	nds							(:473610. ': 344572.			(-) 13.	08 r	n fro	om C	C.D.		MBH-	03
			LOST			GRAIN :	SIZE AN	ALYSIS			ATTERBERG								SHE	AR PARA	METERS
N V AL UE	D EP TH ,m ts	SA M PL E	DESCRIPTION	IS C LA SSI FI C AT IO	G R A VE L,	SA N D, (C o ar se	SA N D (m e di u m	SA N D (fi ne),	SIL T A N D C LA Y	LI Q UI D LI MI	PL AS TI C LI MI T	PL AS TI C IN D EX %	SH RI N K A G E LI MI	FIE LD M OI ST UR E C O NT E NT E	D RY D E NS ITY	W ET D E NS ITY , g m (s	SP E CI FI C G R A VI TY O F	FR EE S W EL U N G IN D EX	TE ST M ET H O	C oh esi on c in Kg / m 2	О т О Z т О Z У S Z Z О Z Z Z В Т В Т В Т В В В В В В В В В В В
>100	1.50	SPT-1	Sandy Silty Clay	CI	5	5	9	10	71	48	32	16		16.27				40.00			
>100	3.00	SPT-2	Sandy Clay	CI	2	3	7	12	76	43	19	24		16.32				20.00			
>100	4.50	SPT-3	Sandy Clay	-	6	4	5	11	74		NOTE-	-1		20.83				30.00			
>100	6.00	SPT-4	Gravelly Silty Clay	-	29	1	5	1	64		NOTE-	-1		17.69				30.00			
>100	7.50	SPT-5	Silty Clay	-	0	0	0	2	98		NOTE-	-1		14.61							
>100	9.00	SPT-6	Silty Clay	CI	0	2	0	5	93	45	25	20		16.66				40.00			
>100	10.50	SPT-7	Silty Clay	-	0	1	2	4	93		NOTE-	-1		11.11							
-	10.58	C.S-1	Rock					С	ore Red	covery	= 24.64	1% , R.Q.[). =	0.00%							
-	12.00	C.S-2	Rock		Core Recovery = 14.00%, R.Q.D. = 0.00%																
-	13.50	C.S-3	Rock					С	ore Re	covery	= 14.00	% , R.Q.D). =	0.00%							
-	15.00	C.S-4			Disintegrated Rock Pieces																
-	16.50	C.S-5		Disintegrated Rock Pieces																	

-	18.00	SPT-8	Silty Clay	CI	0	0	5	5	90	44	25	19	14.2	8		40.00		
>100	21.00	SPT-9	Silty Clay	CI	0	0	3	2	95	42	24	18	13.6	3		30.00		
>100	24.00	SPT-10	Silty Clay	-	0	0	2	7	91		NOTE-	-1	12.	0				
>100	27.00	SPT-11	Silty Clay	-	0	0	2	5	93		NOTE-	-1	17.	4		60.00		
>100	30.00	SPT-12	Silty Clay	CI	0	0	0	7	93	46	26	20	14.	8		60.00		

NOTE -1 N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS

			Project: Sub soil inves	ligatio	on for	cons	tructi	ion of	i bridge	19.03	date & E 2020 - 24	.03.2020			36.05	m				Table	
	TEST RESU	LTS	over					NI Ialaa		CC	DORDINA	ATES		Sea	Bed	l Le	vel				ole No
			Middle Strait creek in th	ie unio	on teri	nory c	л А&	N ISIQ	nas		73674.08 344601.91			(-) 13.87	7 m	fror	n C.	D.		MBH	-04
			SOIL DESCRIPTION			GRAIN S	IZE AN	ALYSIS		AT	TERBERG LI	MITS							SHE	AR PAR	AMETERS
N V AL UE	D EP TH ,,m trs	SA M PL E		IS C L ^A SSI FI C AT 10 2	G R A VE L,	SA N D, (c o ar se)	SA N D (m e di u m	SA ND (fi ne)	SIL T A N D C L Y		PL AS TI C LI MI T	PL AS TI C IN D	SH RI N K A G E LI MI	FIE LD M OI ST UR E C O NT E NT	D RY D E NS ITY , g m	W ET D E NS ITY , g m (s	SP E CI FI C G R A VI Y O F	FR EE S W EL LI N G IN D EX	TE ST M ET H O	C oh esi on ,c in Kg /c m 2	ANGLEOFSHEARINGEENDEG
22	1.50	SPT-1	Silty Sand	SM	6	8	25	32	29	NC	ON PLAS	STIC		31.25							
27	3.00	SPT-2	Silty Sand	SM	1	8	27	37	27	NC	ON PLAS	STIC		15.62							
61	4.50	SPT-3	Silty Sand	SM	1	7	26	33	33	NC	ON PLAS	STIC		12.12							
>100	6.00	SPT-4	Sandy Clay	CI	1	1	14	30	54	48	25	23		7.69							
>100	7.50	SPT-5	Sandy Clay	CI	1	1	10	32	56	49	25	24		13.88							
38	9.00	SPT-6	Sandy Clay	CI	1	1	1	12	85	46	22	24		21.95				50.00			
43	10.50	SPT-7	Sandy Clay		1	1	1	29	68					19.86				20.00			
48	12.00	SPT-8	Sandy Clay	CI	5	2	2	8	83	47	26	21		16.98				50.00			
56	13.50	SPT-9	Sandy Silty Clay	CI	4	1	10	20	65	38	25	13		18.00				40.00			
>100	15.00	SPT-10	Sandy Silty Clay****	-	3	1	8	16	72		NOTE-1			10.00				40.00			
>100	18.00	SPT-11	Sandy Silty Clay****	-	1	0	9	14	76		NOTE-1			15.40				60.00			
>100	21.00	SPT-12	Sandy Clay		0	3	6	11	80				15.78				40.00				

>100	24.00	SPT-13	Sandy Clay	0	2	4	8	86	NOTE-1	12.90	10.00	
>100	27.00	SPT-14	Gravelly Clay	34	1	1	1	63	NOTE-1	12.88	30.00	
>100	30.00	SPT-15	Gravelly Clay	38	1	1	1	59	NOTE-1	12.36	10.00	
>100	33.00	SPT-16	Sandy Gravelly Clay	36	1	6	10	47		12.89	20.00	
>100	36.00	SPT-17	Sandy Gravelly Clay	34	1	4	14	47		11.56	40.00	

NOTE -1 N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS *** SOIL DESCRIPTION BASED ON VISUAL IDENTIFICATION

										Start (Date &	End Date		Te	erminatio	n Depth	1			Table	
			Project: Sub soil inve							04.05.	2020 - (09.05.2020			37.60	mtr				12	
TE	ST RESU	JLTS	bridge over Middle S of A&N Islands	Strait c	reek	in th	e uni	on te	erritory	С	OORDI	NATES		S	ea Bed	l Level				Bore Ho	le No
			or Adivisianas								:473773 134464			(-) 2	25.11 m	from C	C.D.			МВН	-05
			SOIL DESCRIPTION		G	RAIN S	IZE ANA	LYSIS		A.	TTERBERG	LIMITS							S	HEAR PAR	
N V AL UE	DE PT H, mt rs	SA M PL E		IS CL AS SIF IC AT IO N	G R A VE L,	SA N D, (c o ar se)	SA ND(mediu m,	SA ND(fine),%	SIL T A N D CL A Y	U Q UI D U M T	PL AS TI C LI MI T	PL AS TI C IN DE X %	SH RI N K A G E LI MI T	FIE LD M OI ST E C O NT EN T, %	D RY DE NS ITY , g m /c c	W ET DE NS ITY , g m /c c	SP E CI FI C G R A VI TY O F S	FR EE S W EL LI N G IN DE X, %	TE ST M ET H O	C oh esi on .c in Kg /c m²	A N G LE O F SH A RI N G RESSTA N C E IN D G RESS
0	1.50	SPT-1	Sandy Clay		9	1	8	11	71					45.71							
0	3.00	SPT-2	Sandy Clay		6	1	9	10	74					45.12							
1	4.50	SPT-3	Sandy Clay		5	1	7	14	73					45.15				30			
3	6.00	SPT-4	Sandy Clay	CI	4	2	6	11	77	43	23	20		43.75				50			
6	7.50	SPT-5	Sandy Silty Clay	CI	1	1	4	10	84	48	36	12		43.25				50			
7	9.00	SPT-6	Sandy Silty Clay	CI	8	2	2	0	88	46	25	21		41.06				40			_
11	10.50	SPT-7	Silty Clay	CI	0	0	1	1	98	44	25	19		35.26				50			
-	12.00	UDS-1	Silty Clay	CI	0	0	1	1	98	40	26	14		30.25	1.43	1.87		50	UCC	0.75	-
26	13.50	SPT-8	Gravelly Silty Clay	CI	24	2	4	7	63	35	29	6		20.68				90			
30	15.00	SPT-9	Silty Clay	CI	0	0	4	1	95	42	20	22		18.29				60			

51	16.50	SPT-10	Sandy Silty Clay	СН	0	0	1	9	90	52	23	29	20.00		100		
63	18.00	SPT-11	Sandy Silty Clay	CI	7	1	3	1	88	42	25	17	20.00		60		
78	19.50	SPT-12	Silty Clay	СН	0	0	1	1	98	58	29	29	16.12		80		
>100	22.50	SPT-13	Sandy Silty Clay	СН	0	0	4	7	89	54	29	25	16.29		40		
>100	25.50	SPT-14	Silty Clay	СН	0	0	1	1	98	58	32	26	15.92		100		
>100	28.50	SPT-15	Silty Clay	СН	0	0	1	1	98	52	31	21	15.25		80		
>100	31.50	SPT-16															
>100	34.50	SPT-17	Weathered Rock														
>100	37.50	SPT-18															

NOTE -1 N > 100, SOIL SAMPLE COLLECTED IN SPLIT SPOON SAMPLER WERE NOT SUFFICIENT FOR ALL LABORATORY TESTS