

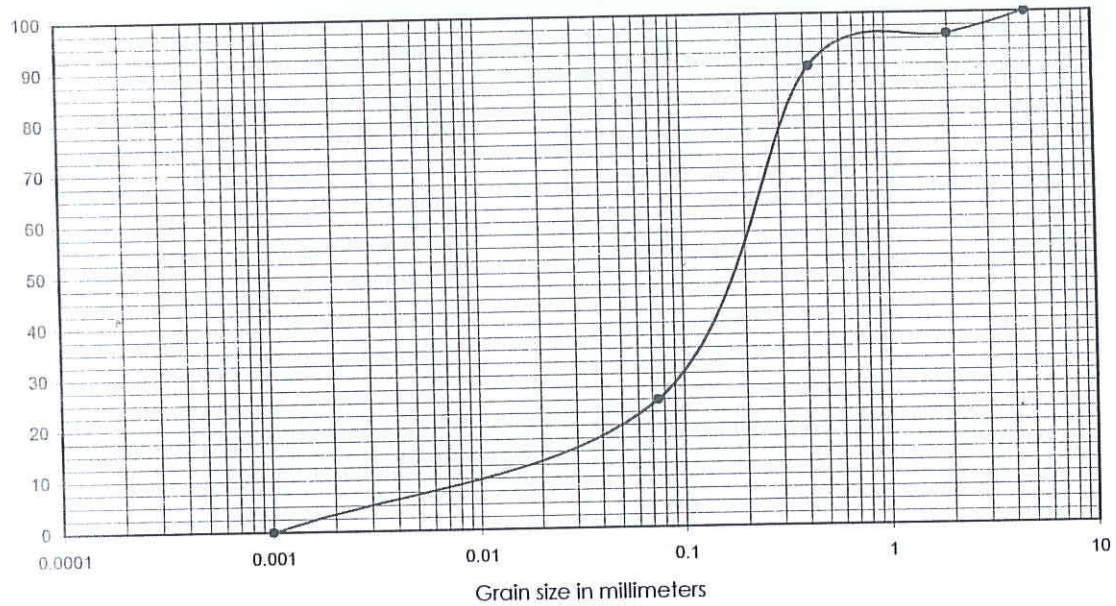
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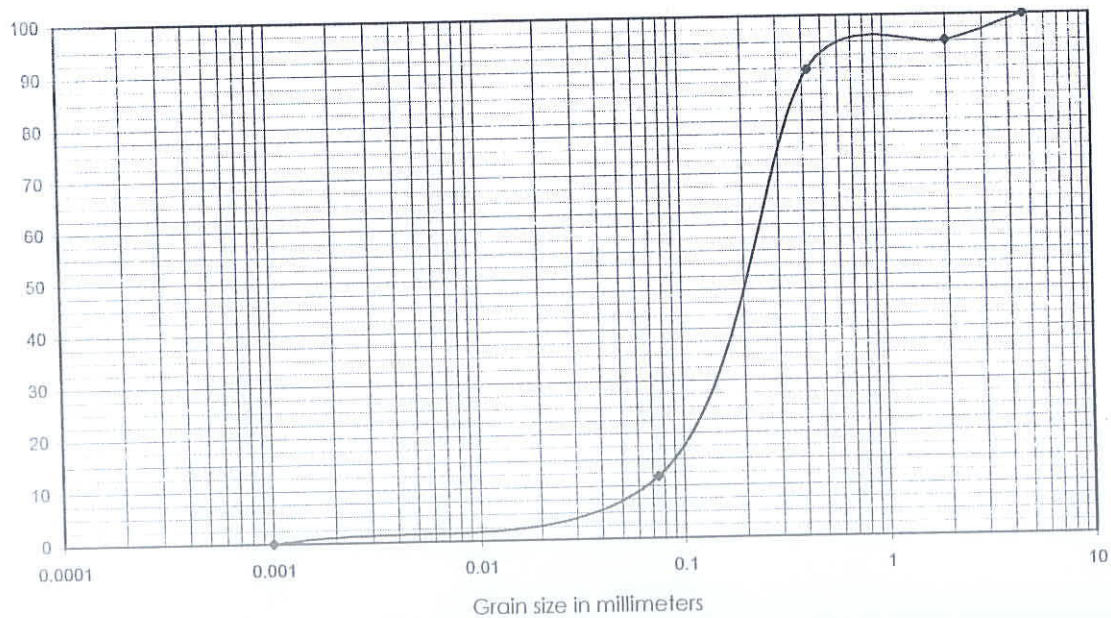
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST





BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-02	52.00	SM	0	75	25	0			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-02	56.00	SM	0	88	12	0			

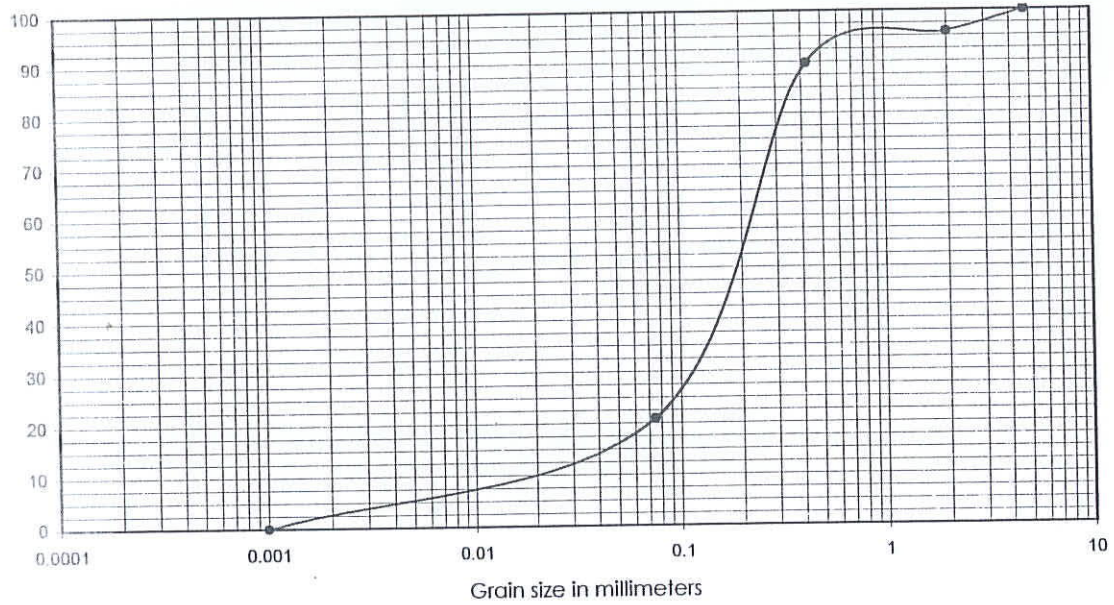
FIG. 51

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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-02	60.00	SM	0	79	21	0			

FIG. 52

Geo Foundations Structures Pvt Ltd



TRI AXIAL TEST

BORE HOLE NO: BH-02  
SAMPLE NO : UDS-2  
DEPTH : 15.0 M  
 $C = 0.12 \text{ kg/cm}^2$   $\phi = 0^\circ$

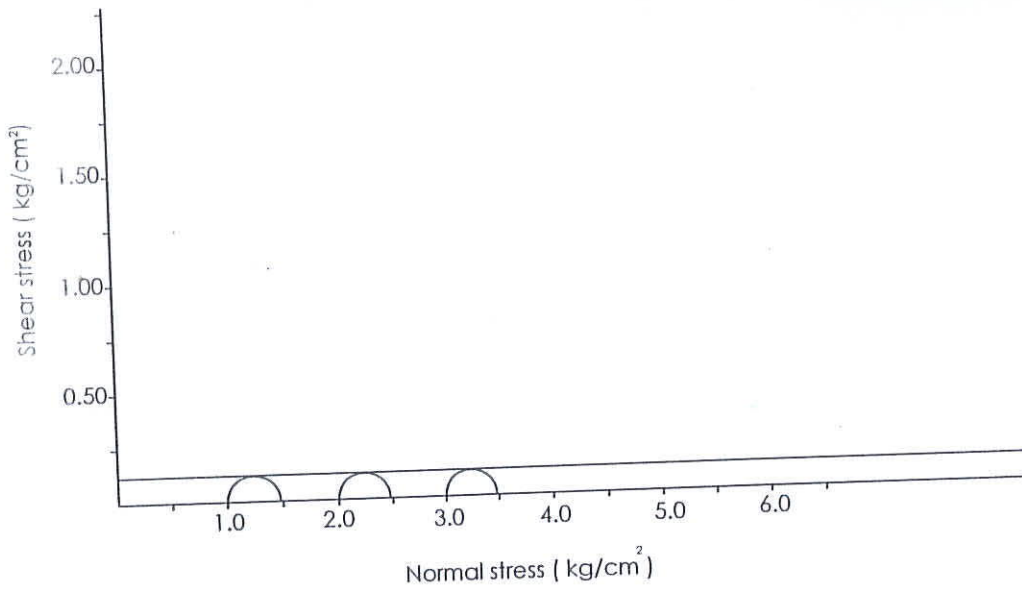


FIG (53)

DIRECT SHEAR TEST

BORE HOLE NO: BH-02  
SAMPLE NO : SPT31  
DEPTH : 56.0M  
 $C = 0 \text{ Kg/cm}^2$   $\phi = 39^\circ$

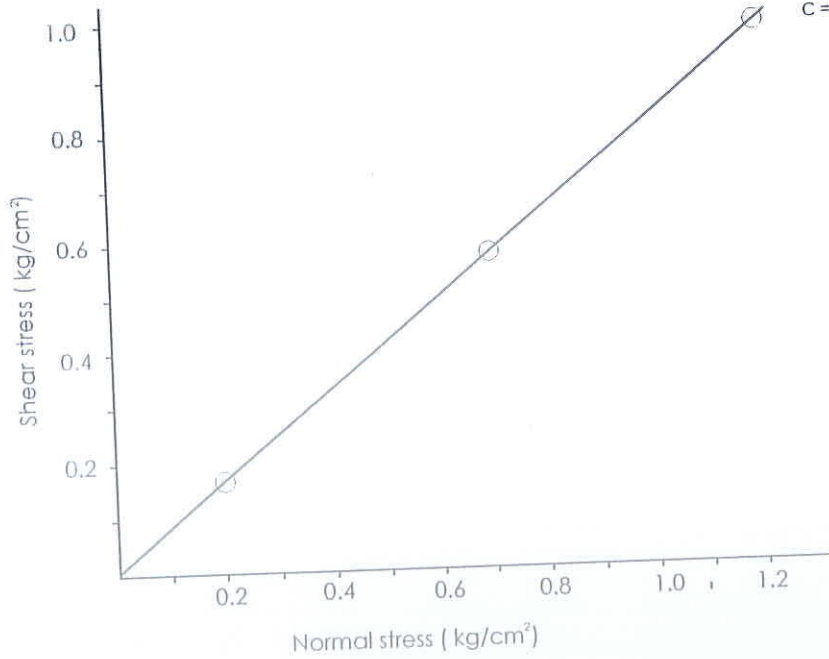
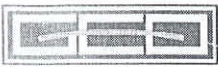



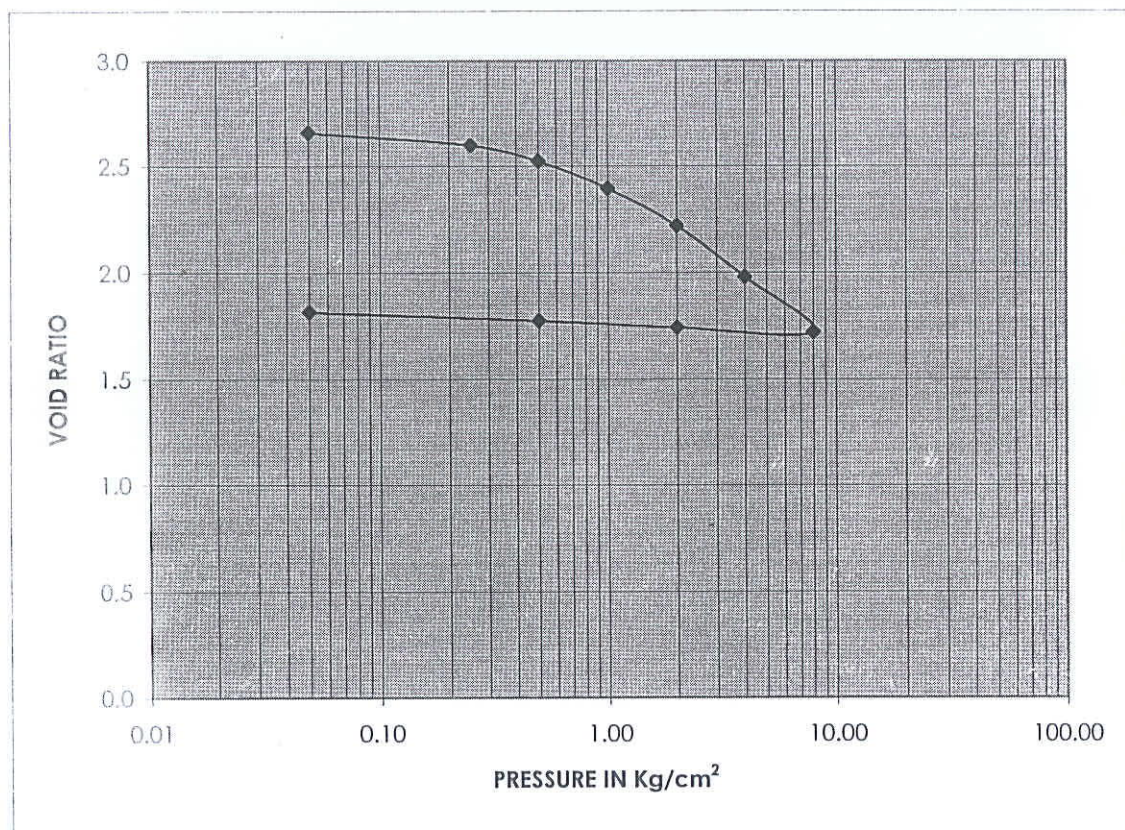
FIG (54)



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**Project: Geotechnical Investigation work for the proposed North Jetty**

**RESULTS OF CONSOLIDATION**

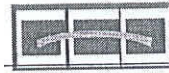


**VOIDS RATION VS LOG P CURVE**

BH NO.	UDS-NO.	DEPTH(M)	Cc	eo
BH-2	UDS-2	15.00	0.86	2.70

Fig.55





TRI AXIAL TEST

BORE HOLE NO: BH-03  
SAMPLE NO : UDS-1  
DEPTH : 12.0 M  
 $C = 0.18 \text{ Kg/cm}^2$   $\phi = 0^\circ$

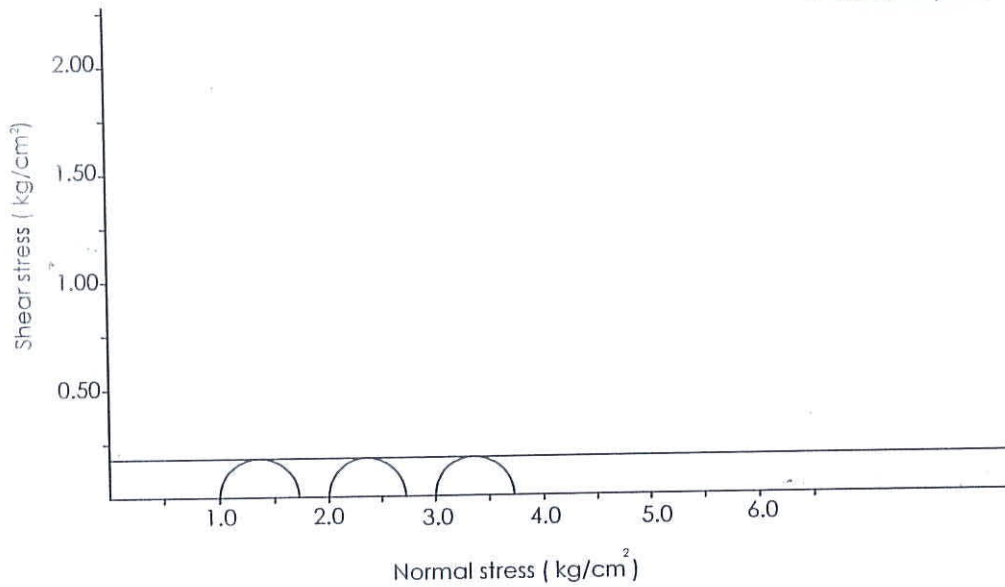


FIG (69)

DIRECT SHEAR TEST

BORE HOLE NO: BH-03  
SAMPLE NO : SPT30  
DEPTH : 54.0M  
 $C = 0 \text{ Kg/cm}^2$   $\phi = 38^\circ$

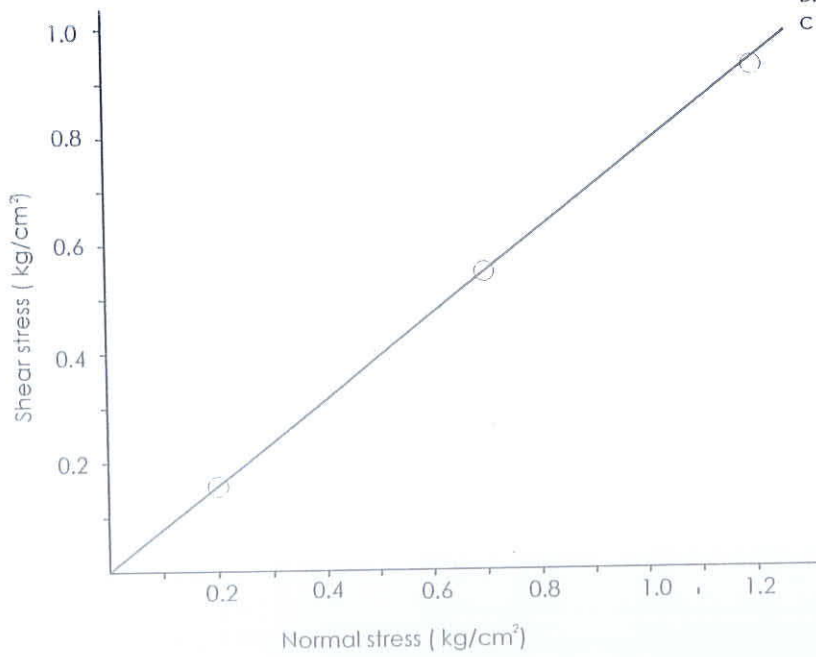
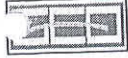


FIG (70)

**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED OF NORTH JETTY**



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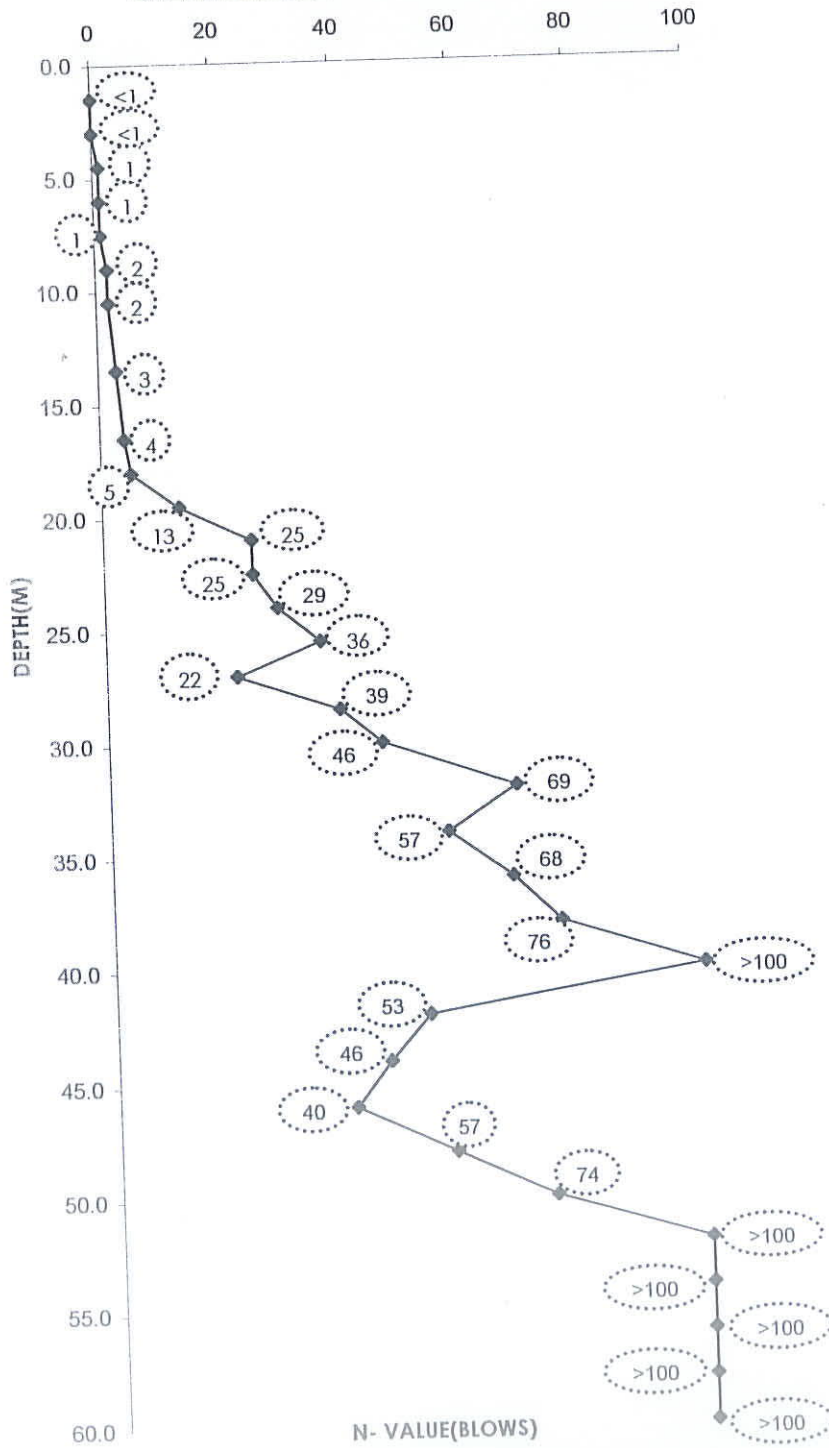
Bore Hole No : **BH-03**  
 Type of Boring : **Rotary**  
 Termination Depth : **60.00 M**

Boring Started : **02.01.2013**  
 Boring Completed : **04.01.2013**  
 High Tide Water : **6.90 m**  
 Low Tide Water : **7.50 m**



**T-1613**

**GRAPHICAL REPRESENTATION OF N VALUE**



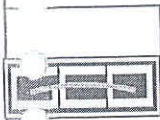
**BORE HOLE TERMINATED AT 60.0 M**

**FIG. 56**

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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**



**GEO FOUNDATIONS & STRUCTURES PVT. LTD**

Bore Hole No : BH-03  
 Type of Boring : Rotary  
 Termination Depth : 60.0m  
 Boring Started : 02.01.2013  
 Boring Completed : 04.01.2013  
 Length of water column : 7.50m  
 Co-ordinates: Lat - 9°57'35.75"N, Long - 76°16'44.77"E



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**LOCATION : INS VENDURUTHY(UNDER WATER BORING)**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>	
	6.00	WATER  EXISTING BED LEVEL		0.00									
	24.0	Clayey Silt with Traces of Sand (Grey)	CH	1.50	1.50-1.95	1	0	0	0				
				3.00	3.00-3.45	1	0	0	0				
				4.50	4.50-4.95	1	0	1	1				
				6.00	6.00-6.45	1	0	1	1				
				7.00	7.00-7.45	VST-1							
				7.50	7.50-7.95	1	0	1	1				
				9.00	9.00-9.45	1	1	1	2				
				10.0	10.0-10.45	VST-2							
				10.5	10.5-10.95	1	1	1	2				
				12.0	12.0-12.45	UDS-1							
				13.5	13.5-13.95	1	1	2	3				
				15.0	15.0-15.45	UDS-2							
				16.5	16.5-16.95	1	2	2	4				
				18.0	18.0-18.45	2	2	3	5				
				19.5	19.5-19.95	5	6	7	13				
21.0	21.0-21.45	8	12	13	25								
22.5	22.5-22.95	9	11	14	25								
24.0	24.0-25.45	9	13	16	29								

(Contd.....fig. 57)

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Fig : 57

**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-03</b>	Boring Started : <b>02.01.2013</b>	
		Type of Boring : <b>Rotary</b>	Boring Completed : <b>04.01.2013</b>	
		Termination Depth : <b>60.0m</b>	Length of water column : <b>7.50m</b>	
Co-ordinates: Lat - 9°57'35.75"N, Long - 76°16'44.77"E				

**LOCATION : INS VENDURUTHY**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>	
	3.00	Clayey Silt with Traces of Sand (G/Yellow)	CH	25.5	25.5-25.95	10	15	21	36				43/45cm penetration
				27.0	27.0-27.45	7	9	13	22				
	3.50	Sandy Clayey Silt (Grey)	CI	28.5	28.5-28.95	10	13	26	39				
				30.0	30.0-30.45	11	17	29	46				
	11.40	Clayey Silty Sand with Presence of Organic Matter (Grey)	SC	32.0	32.0-32.45	10	24	45	69				
				34.0	34.0-34.45	13	21	36	57				
				36.0	36.0-36.45	16	28	40	68				
				38.0	38.0-38.45	18	29	47	76				
				40.0	40.0-40.45	20	44	56	>100				
				42.0	42.0-42.45	19	24	29	53				
	7.50	Sandy Clayey Silt(P/Grey)	CH	44.0	44.0-44.45	13	20	26	46				
				46.0	46.0-46.45	14	17	23	40				
				48.0	48.0-48.45	20	27	30	57				
				50.0	50.0-50.45	19	28	46	74				
	10.6	Silty Sand (P/Grey)	SM	52.0	52.0-52.45	34	100	-	>100			30/45cm penetration	
				54.0	54.0-54.45	21	69	31	>100			40/45cm penetration	
				56.0	56.0-56.45	43	76	24	>100			32/45cm penetration	
				58.0	58.0-58.45	100	-	-	>100			15/45cm penetration	
				60.0	60.0-60.45	62	100	-	>100			21/45cm penetration	

Termination Depth : 60.0m

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Fig : 58

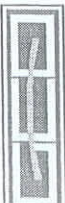

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NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED OF NORTH JETTY		Hide Tide Water : 7.50 M		Date of Boring Started : 02.01.2013		Table No: 10		T-1613					
LOCATION: NAVAL BASE		Low Tide water : 6.90 M		Date of Boring Completed : 04.01.2013		UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS					
N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAVEL (%)	GRAIN SIZE ANALYSIS (%) IS 2720(Part-5):1985			WET	DRY	METHOD	C	Ø (°)
						SAND	SILT	CLAY					
				IS	NMC (%)	LL	PL	PI	FSI (%) IS 2720 (Part-6): 1972	SPG (IS 2720 Part-3/sec 1): 1980			
				IS	2720	2720 (Part-2): 1973	ATTERBERG'S LIMIT (%) IS 2720 (Part-5): 1985		IS 2720 (Part-4): 1977				
				IS	2720	2720 (Part-2): 1973	LL	PL	PI				
				IS	2720	2720 (Part-2): 1973	Termination Depth : 60.00 M						
<b>BOREHOLE BH/03</b>													
<1	1.50	SPT1	Sandy Silt with Traces of Sand (Grey)	CH	0	3	60	37	120	131	39	92	
<1	3.00	SPT2	Sandy Silt with Traces of Sand (Grey)	CH									
1	4.50	SPT3	Sandy Silt with Traces of Sand (Grey)	CH	0	5	60	35	110	119	35	84	
1	6.00	SPT4	Sandy Silt with Traces of Sand (Grey)	CH	0	8	53	39	106	115	38	77	
-	7.00	VST1	Sandy Silt with Traces of Sand (Grey)	CH								0.027	-
1	7.50	SPT5	Sandy Silt with Traces of Sand (Grey)	CH									
2	9.00	SPT6	Sandy Silt with Traces of Sand (P/Grey)	CH	0	3	56	41	94				
-	10.0	VST-2	Sandy Silt with Traces of Sand (P/Grey)	CH								0.06	-
2	10.5	SPT7	Sandy Silt with Traces of Sand (P/Grey)	CH									
-	12.0	UDS1	Sandy Silt with Traces of Sand (P/Grey)	CH	0	1	65	34	101	110	37	73	0.18
3	13.5	SPT8	Sandy Silt with Traces of Sand (P/Grey)	CH									
-	15.0	SPT9	Sandy Silt with Traces of Sand (P/Grey)	CH	0	3	60	37	97	106	35	71	0.12
4	16.5	UDS2	Sandy Silt with Traces of Sand (G/Yellow)	CH	0	2	60	38	90				
5	18.0	SPT10	Sandy Silt with Traces of Sand (G/Yellow)	CH									
13	19.5	SPT11	Sandy Silt with Traces of Sand (G/Yellow)	CH	0	9	52	38	62				
25	21.0	SPT12	Sandy Silt with Traces of Sand (G/Yellow)	CH	0	5	55	40	61	74	30	44	

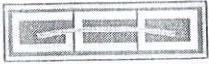
NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED OF NORTH JETTY																	
LOCATION: NAVAL BASE		Hide Tide Water : 7.50 M		Date of Boring Started : 02.01.2013		Table No. 11											
LOCATION: NAVAL BASE		Low Tide water : 6.90 M		Date of Boring Completed : 04.01.2013		UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS									
SOIL DESCRIPTION		GRAIN SIZE ANALYSIS (%) IS 2720(Part-5): 1985		ATTEBERG'S LIMIT (%) IS 2720(Part-5): 1985		UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS									
N	DEPTH (M)	SAMPLE	I.S. CLASSIFICATION	GRAVEL	SAND	SILT	CLAY	LL	PL	PI	SL (%) IS 2720(Part-6): 1972	FSI (%) IS 2720(Part-40): 1977	SFG (IS 2720(Part-3): 1980)	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS	
														WET	DRY	METHOD	Ø (°)
<b>BOREHOLE BH/03</b>																	
25	22.5	SPT13	CH														
29	24.0	SPT14	CH	0	2	43	55										
36	25.5	SPT15	CH														
22	27.0	SPT16	CH	0	2	46	52	77	32	45			2.41	1.64	1.06	UCS	0.80
39	28.5	SPT17	CI	0	35	33	32	24									
46	30.0	SPT18	CI														
69	32.0	SPT19	SC	0	58	27	15	40	20	20							
57	34.0	SPT20	SC														
68	36.0	SPT21	SC	0	55	27	18	25									
76	38.0	SPT22	SC	0	54	29	17	23	41	21							
>100	40.0	SPT23	SC														
53	42.0	SPT24	CH	0	23	40	37	40	68	29	39		2.47	1.78	1.27	UCS	1.45
46	44.0	SPT25	CH														
57	46.0	SPT26	CH	0	21	45	34	38									
74	48.0	SPT27	CH	0	19	50	31	37	62	28	34						
>100	50.0	SPT28	SM	0	75	25	0	18	No Limit								
>100	52.0	SPT29	SM														



		<b>NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED OF NORTH JETTY</b>										<b>Table No.12</b>							
<b>LOCATION: NAVAL BASE</b>		Hide Tide Water : 7.50 M Low Tide water : 6.90 M		Date of Boring Started : 02.01.2013 Date of Boring Completed : 04.01.2013 Termination Depth : 60.00 M		SFG (IS 2720 (Part-13):1986)		UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS 2720 (Part-13):1986									
N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAIN SIZE ANALYSIS (%) IS 2720 (Part-5):1985			NMC (%) IS 2720 (Part-2):1973	ATTERBERG'S LIMIT (%) IS 2720 (Part-5): 1985			SL (%) IS 2720 (Part-6): 1972	FSI (%) IS 2720 (Part-4):1977	WET	DRY	METHOD	C		
					GRAVEL	SAND	SILT		CLAY	LL	PL							PI	WET
<b>BOREHOLE BH/03</b>																			
>100	54.0	SPT30	Silty Sand (P/Grey)	SM	0	77	23	0	15	No Limit			2.62	2.09	1.82	DST	0	38	
>100	56.0	SPT31	Silty Sand (P/Grey)	SM	0	80	20	0	10	No Limit									
>100	58.0	SPT32	Silty Sand (P/Grey)	SM															
>100	60.0	SPT33	Silty Sand (P/Grey)	SM	0	79	21	0	16	No Limit									







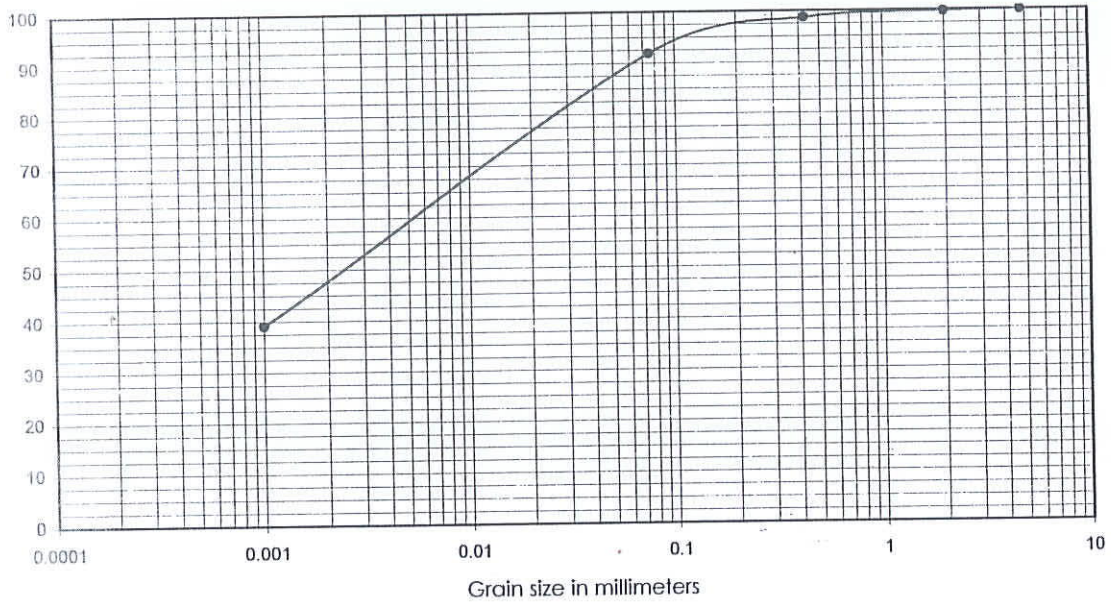
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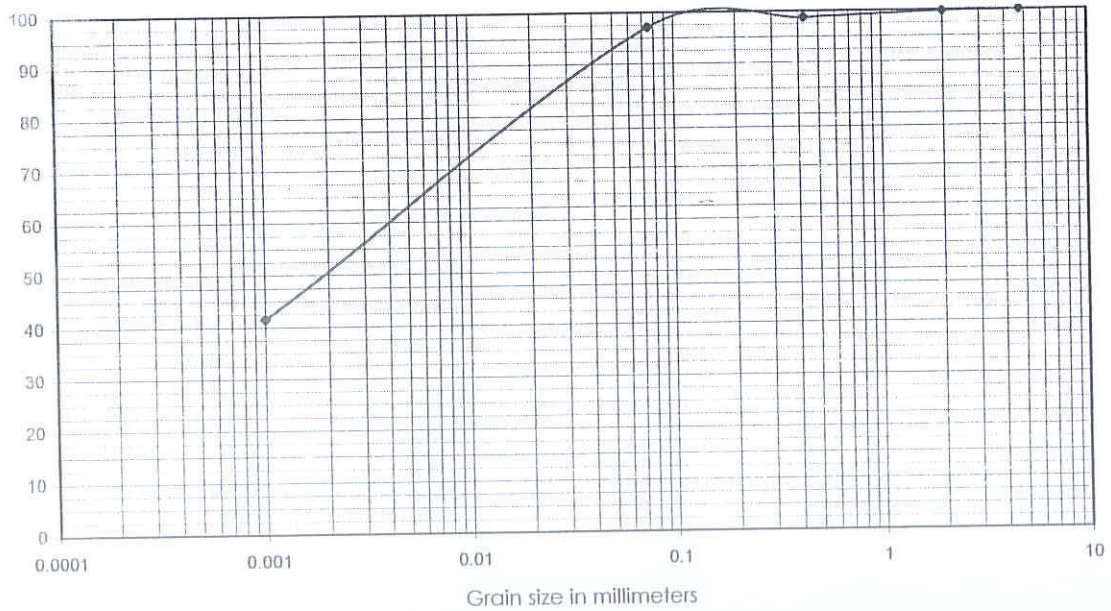
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PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	6.00	CH	0	8	53	39			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	9.00	CH	0	3	56	41			

FIG. 60





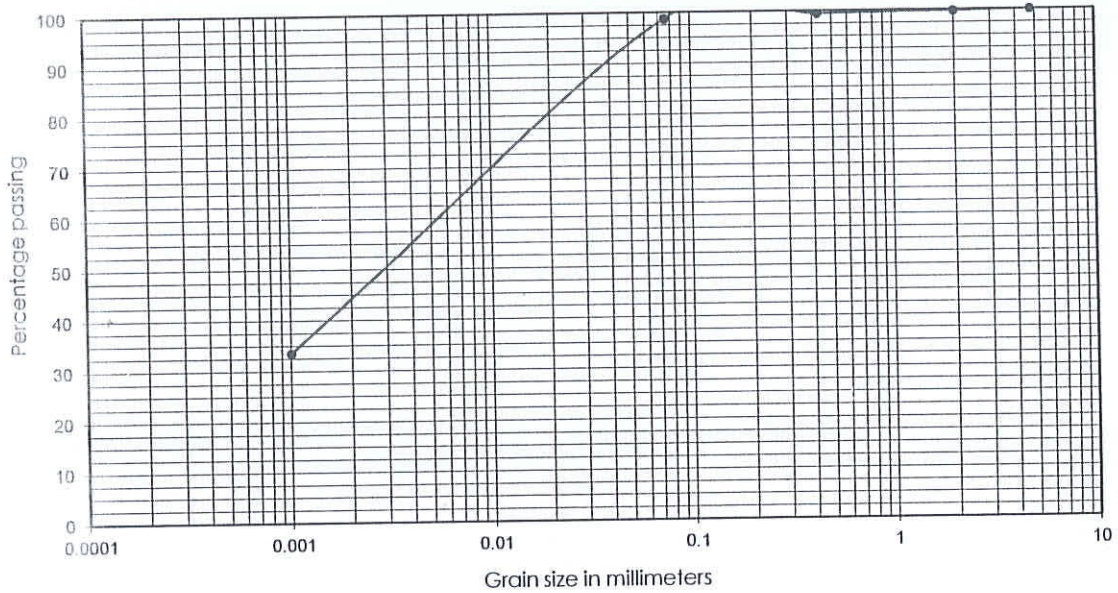
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



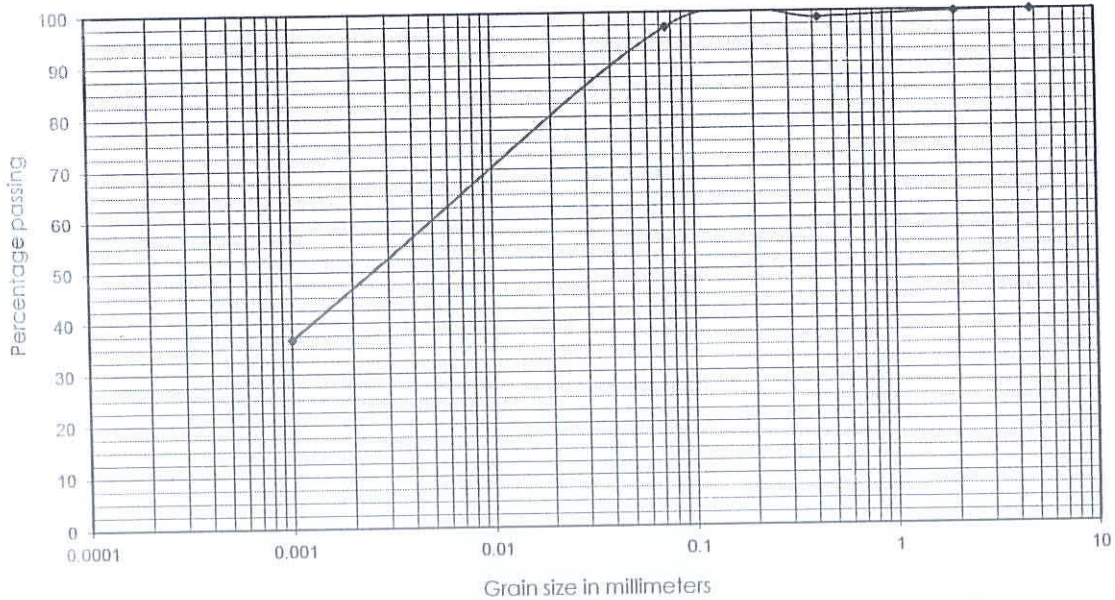
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	12.00	CH	0	1	65	34			

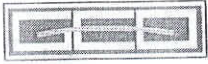


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	15.00	CH	0	3	60	37			

FIG. 61

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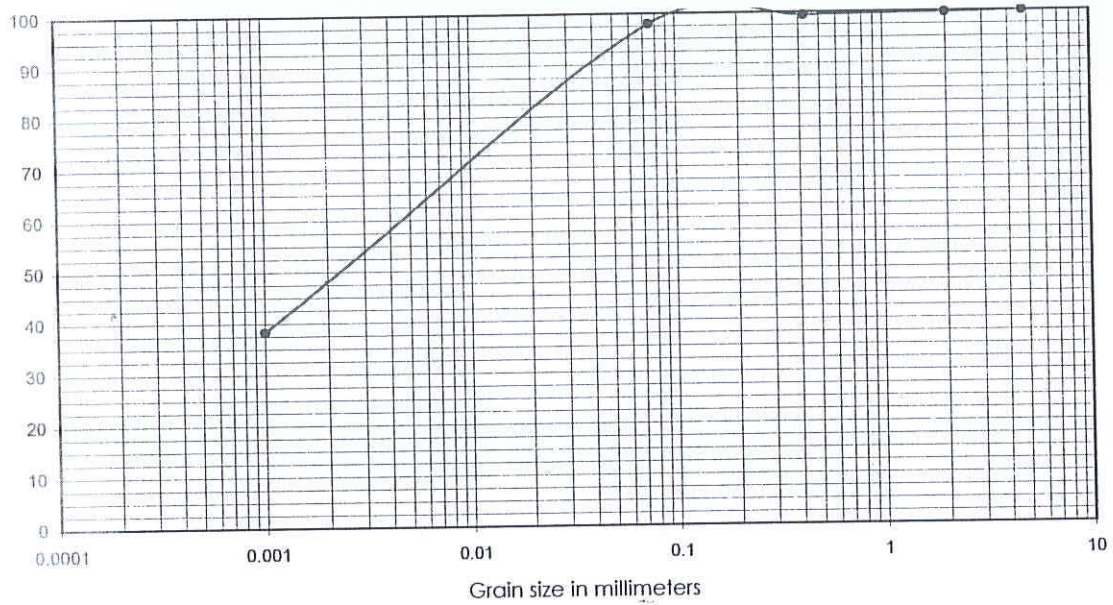
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



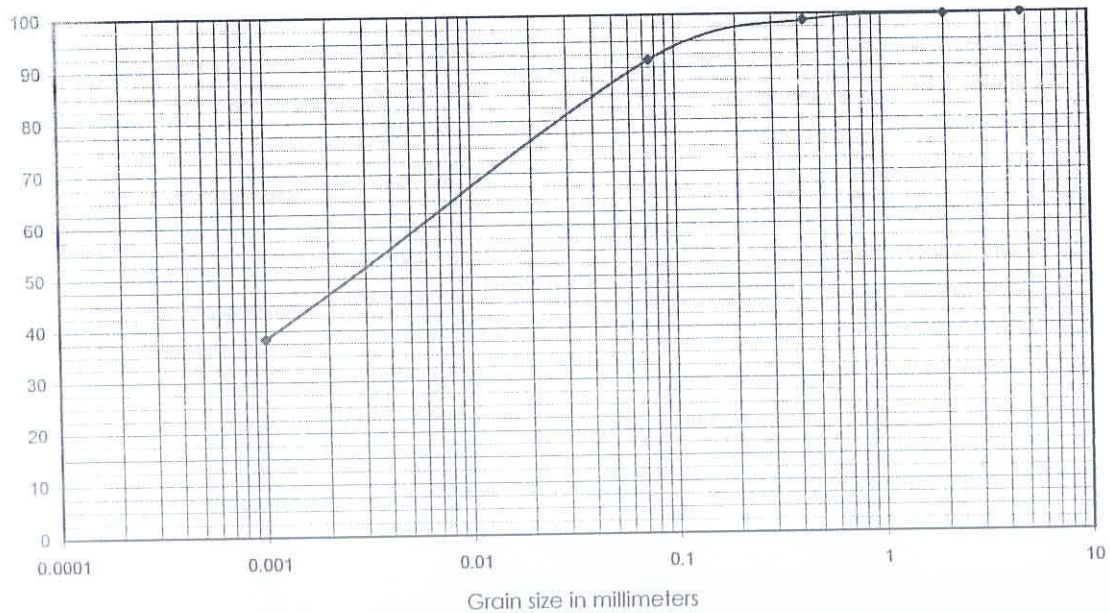
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	16.50	CH	0	2	60	38			

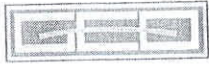


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	19.50	CH	0	9	53	38			

FIG. 62

Geo Foundations Structures Pvt Ltd





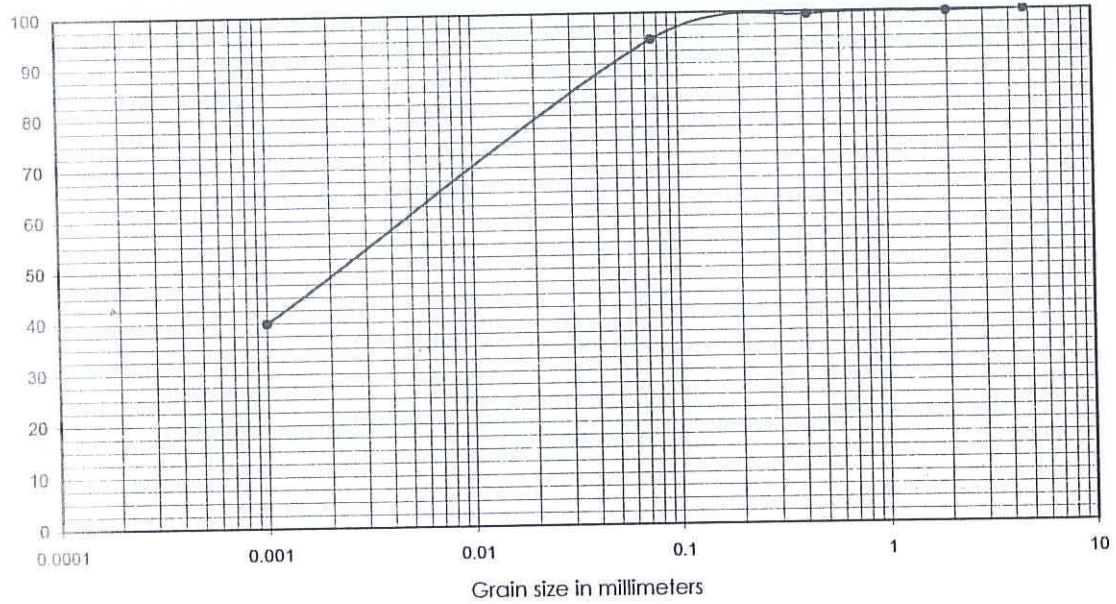
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



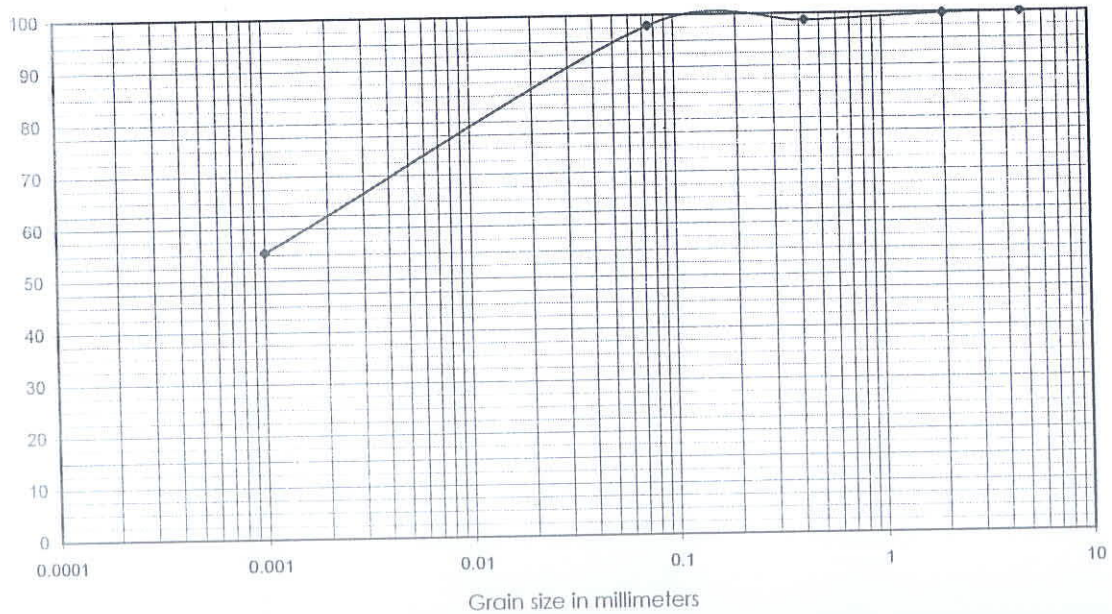
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



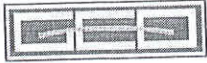
BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	21.00	CH	0	5	55	40			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	24.00	CH	0	2	43	55			

FIG. 63

Geo Foundations Structures Pvt Ltd



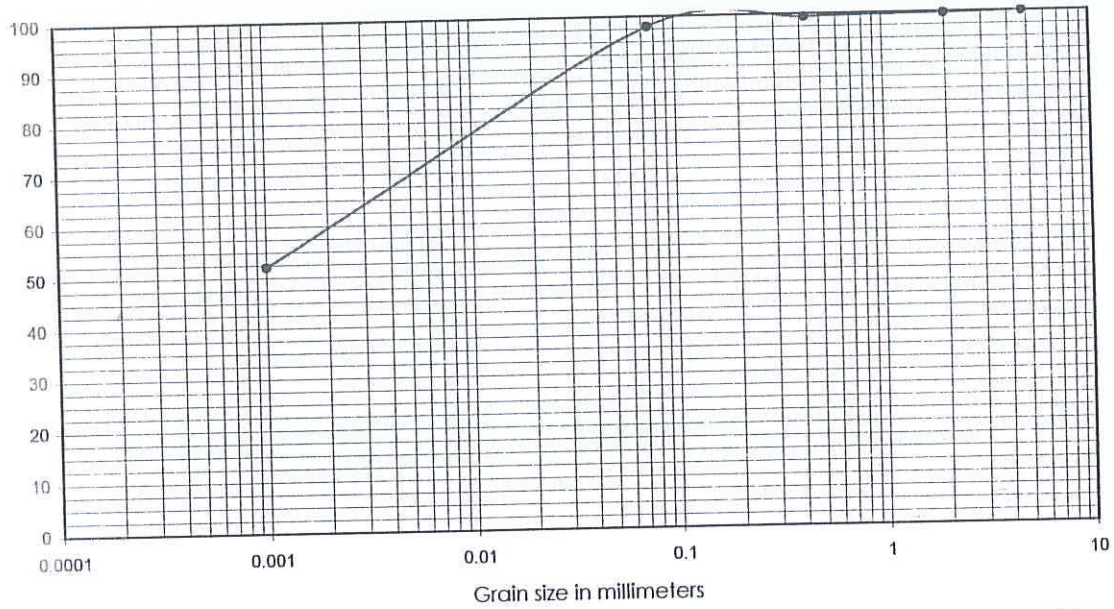
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



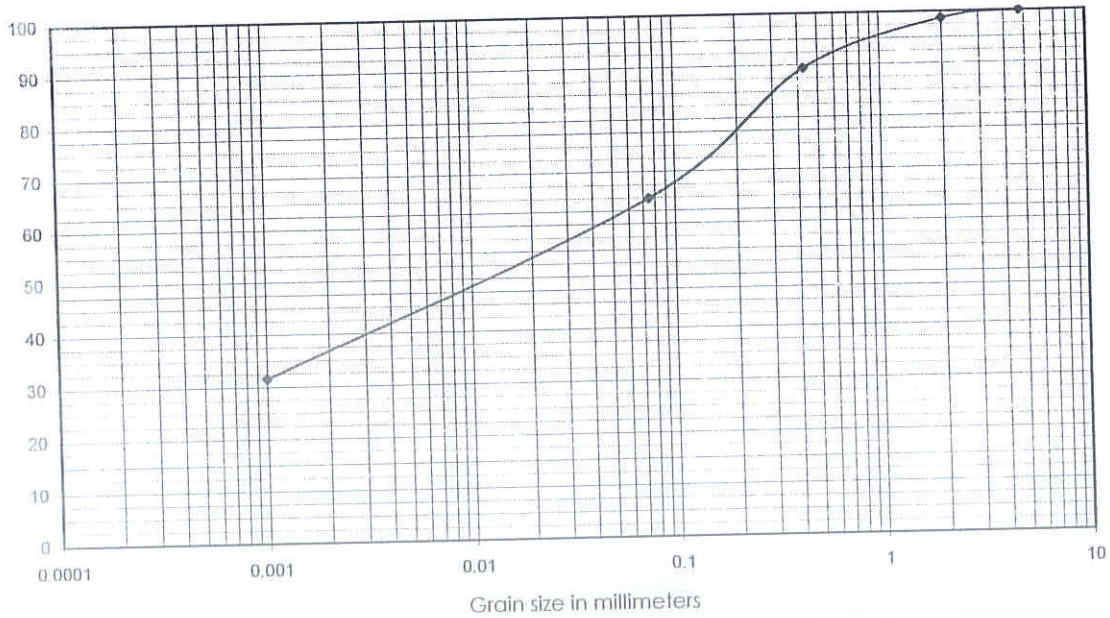
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	27.00	CH	0	2	46	52			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	28.50	CI	0	35	33	32			

FIG. 64

Geo Foundations Structures Pvt Ltd

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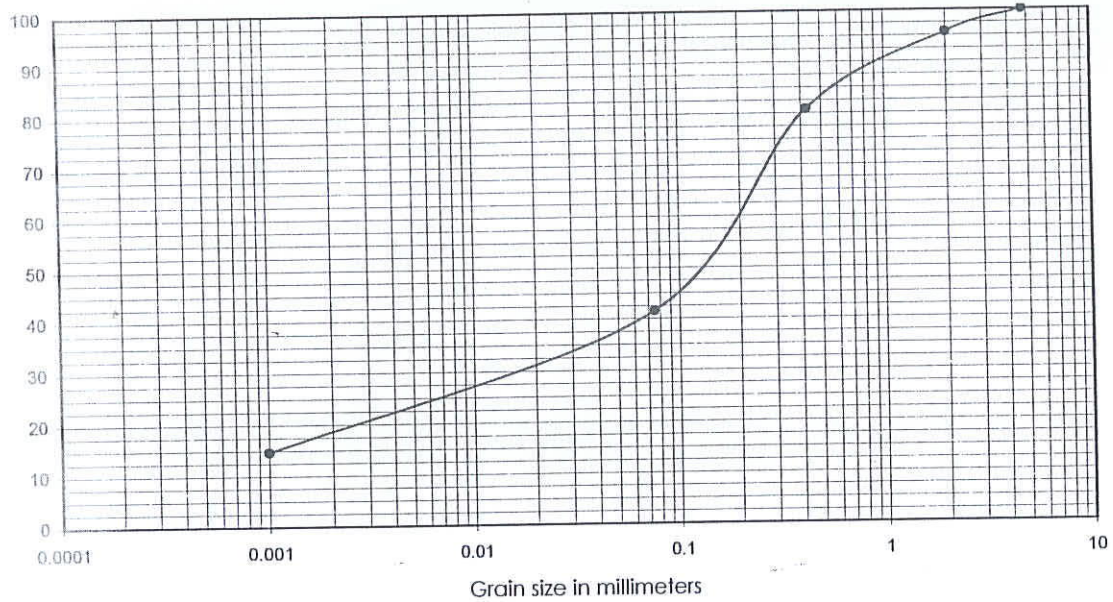
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



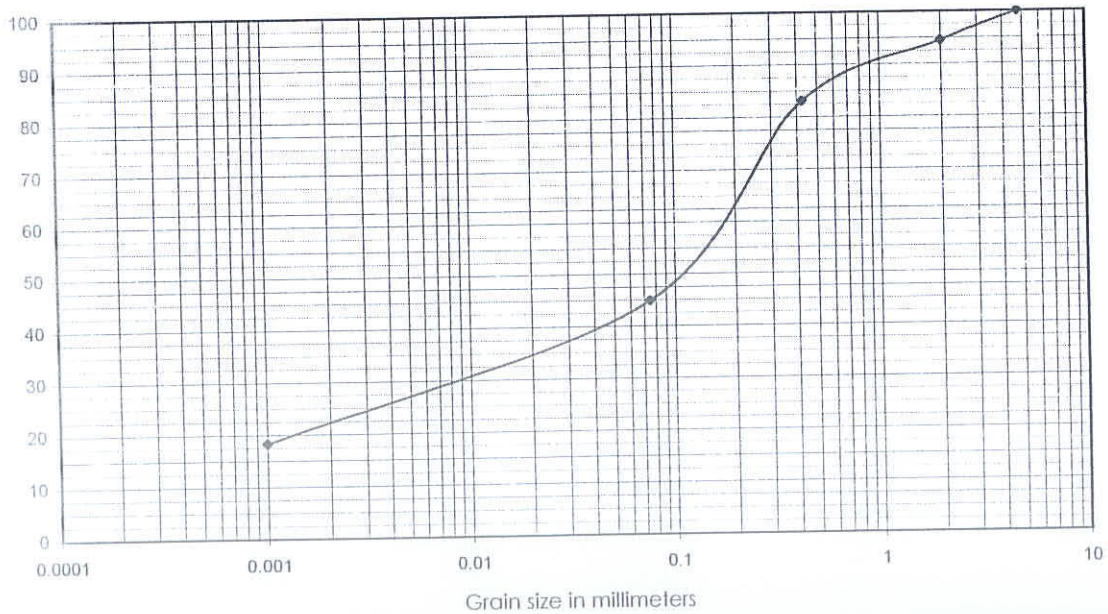
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	32.00	SC	0	58	27	15			

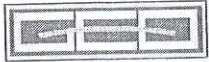


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	36.00	SC	0	55	27	18			

FIG. 65

Geo Foundations Structures Pvt Ltd

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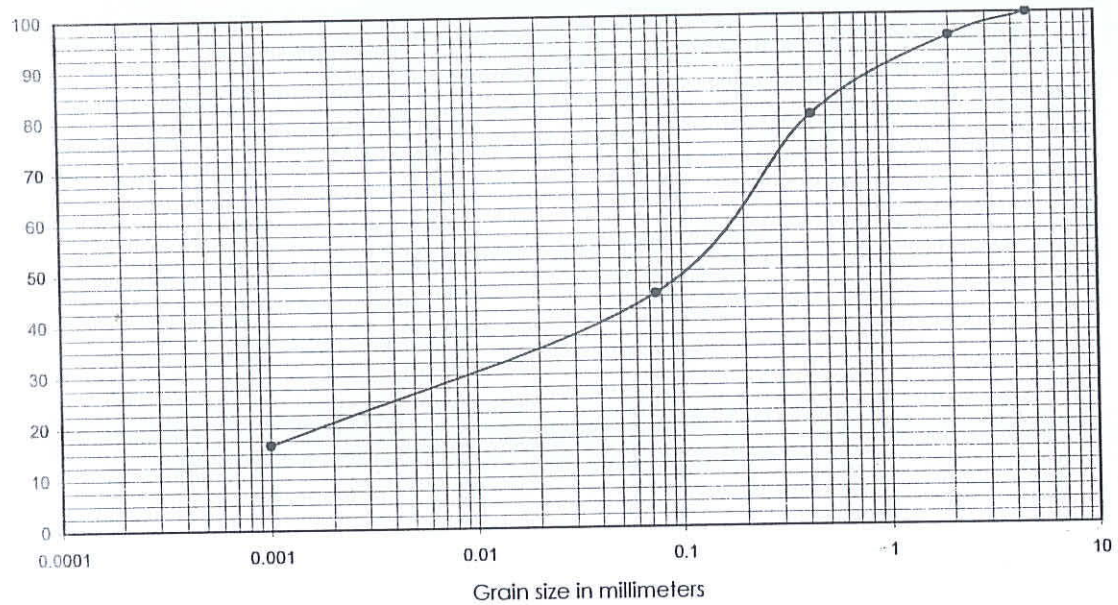
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



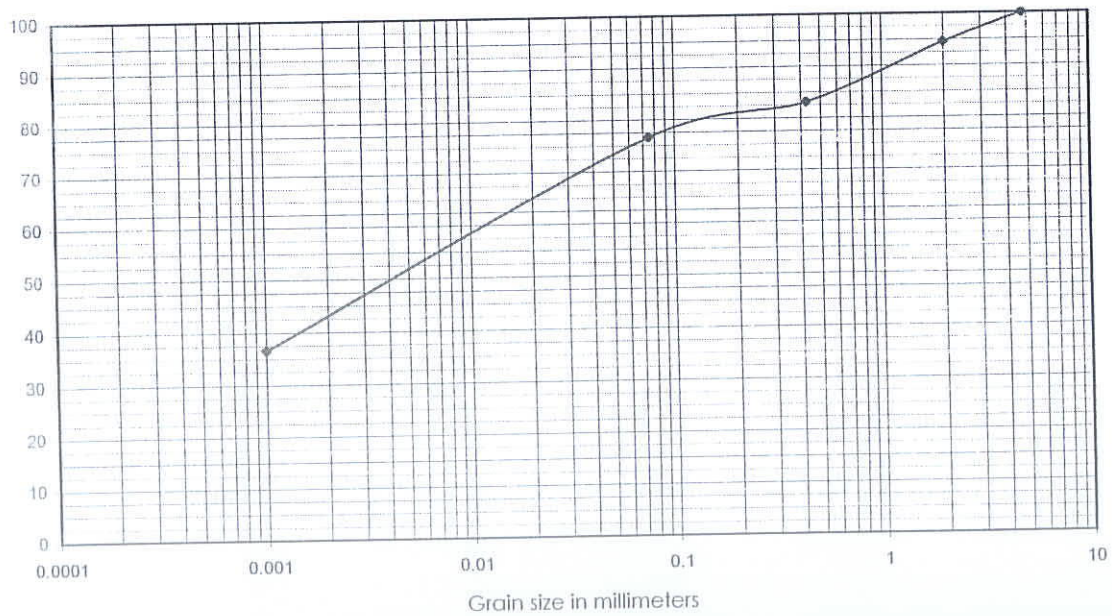
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	38.00	SC	0	54	29	17			

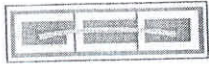


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	42.00	CH	0	23	40	37			

FIG. 66

Geo Foundations Structures Pvt Ltd





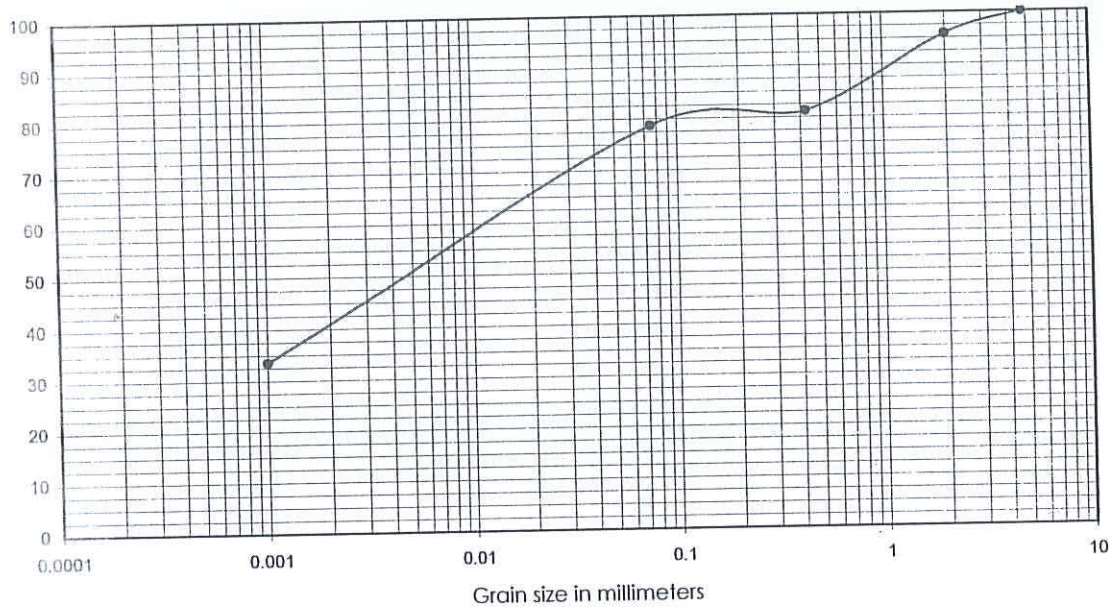
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



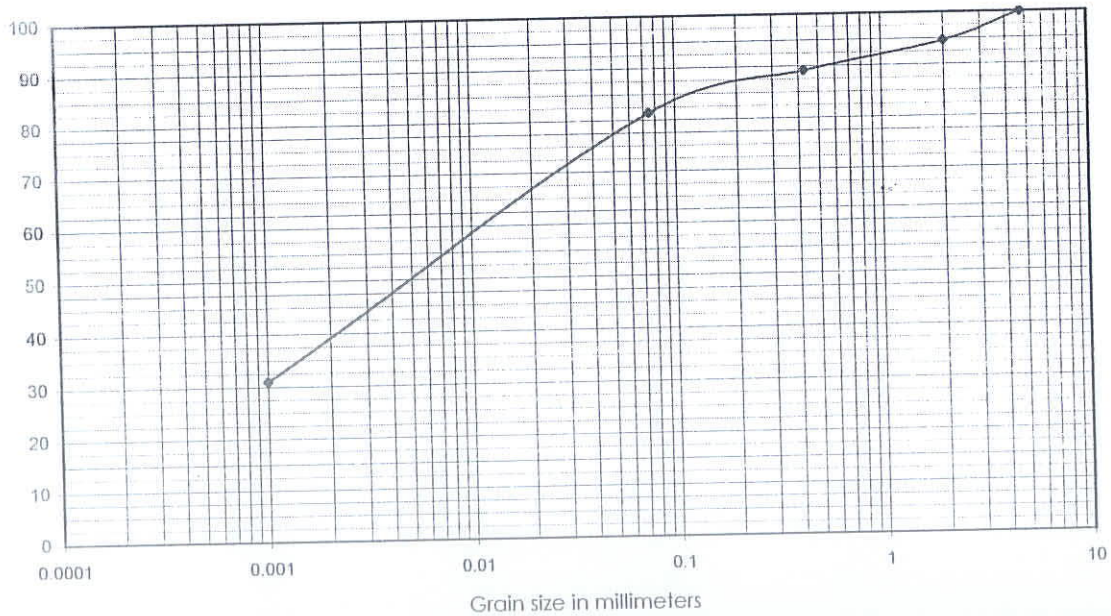
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	46.00	CH	0	21	45	34			

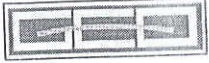


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-03	48.00	CH	0	19	50	31			

FIG. 67

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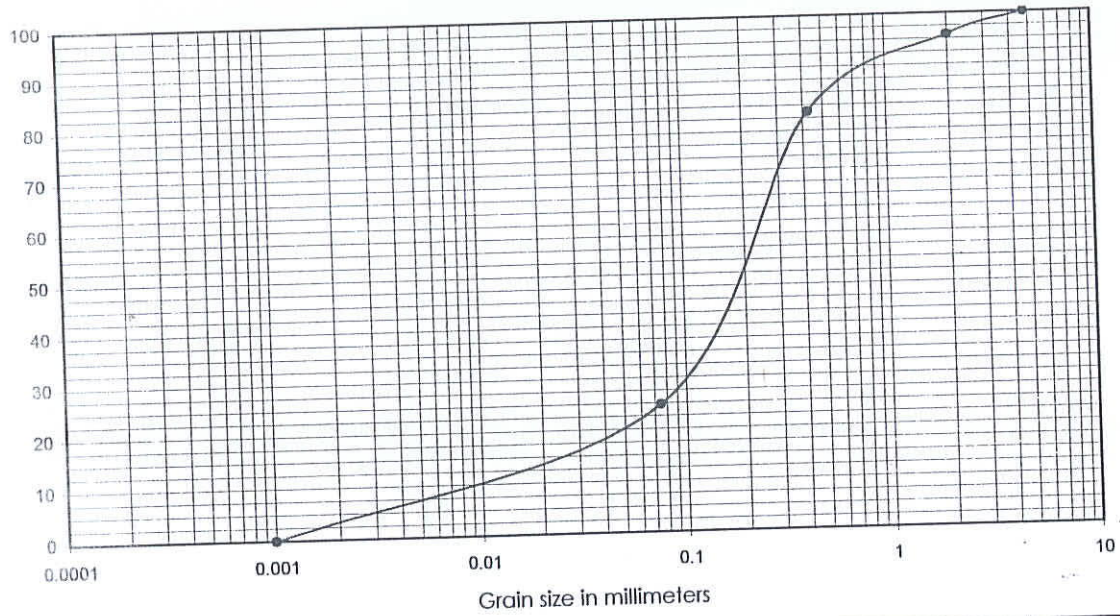


GEO FOUNDATIONS AND STRUCTURES PVT. LTD



T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE  
GRAINSIZE ANALYSIS TEST



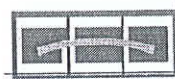
BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-03	50.00	SM	0	75	25	0			

FIG. 68

Geo Foundations Structures Pvt Ltd

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TRI AXIAL TEST

BORE HOLE NO: BH-03  
SAMPLE NO : UDS-1  
DEPTH : 12.0 M  
 $C = 0.18 \text{ Kg/cm}^2$   $\phi = 0^\circ$

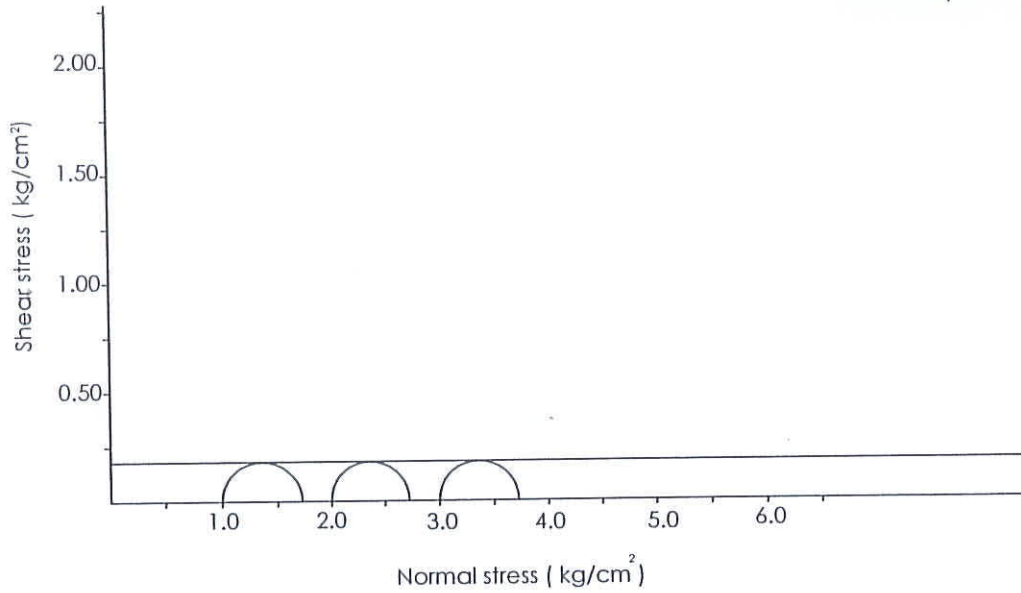


FIG (69)

DIRECT SHEAR TEST

BORE HOLE NO: BH-03  
SAMPLE NO : SPT30  
DEPTH : 54.0M  
 $C = 0 \text{ Kg/cm}^2$   $\phi = 38^\circ$

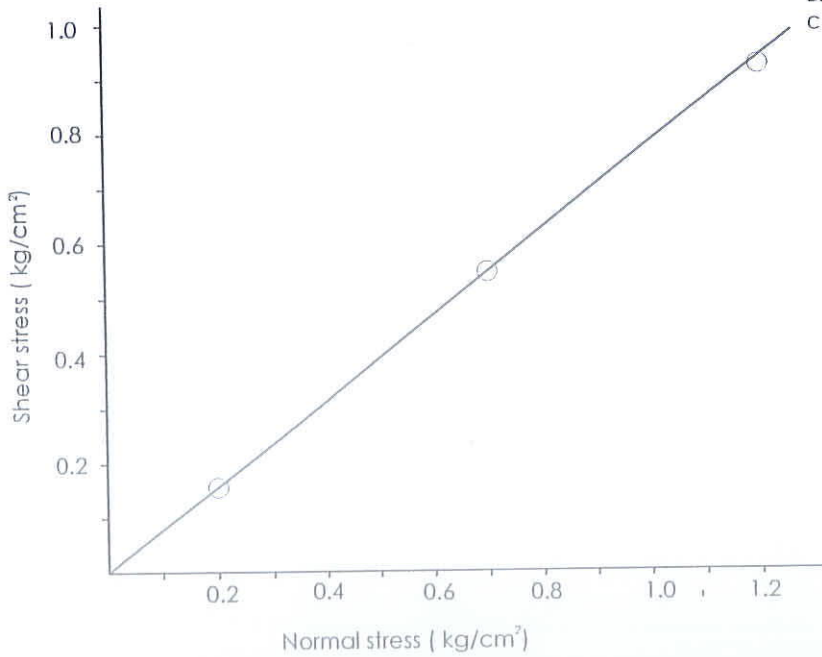


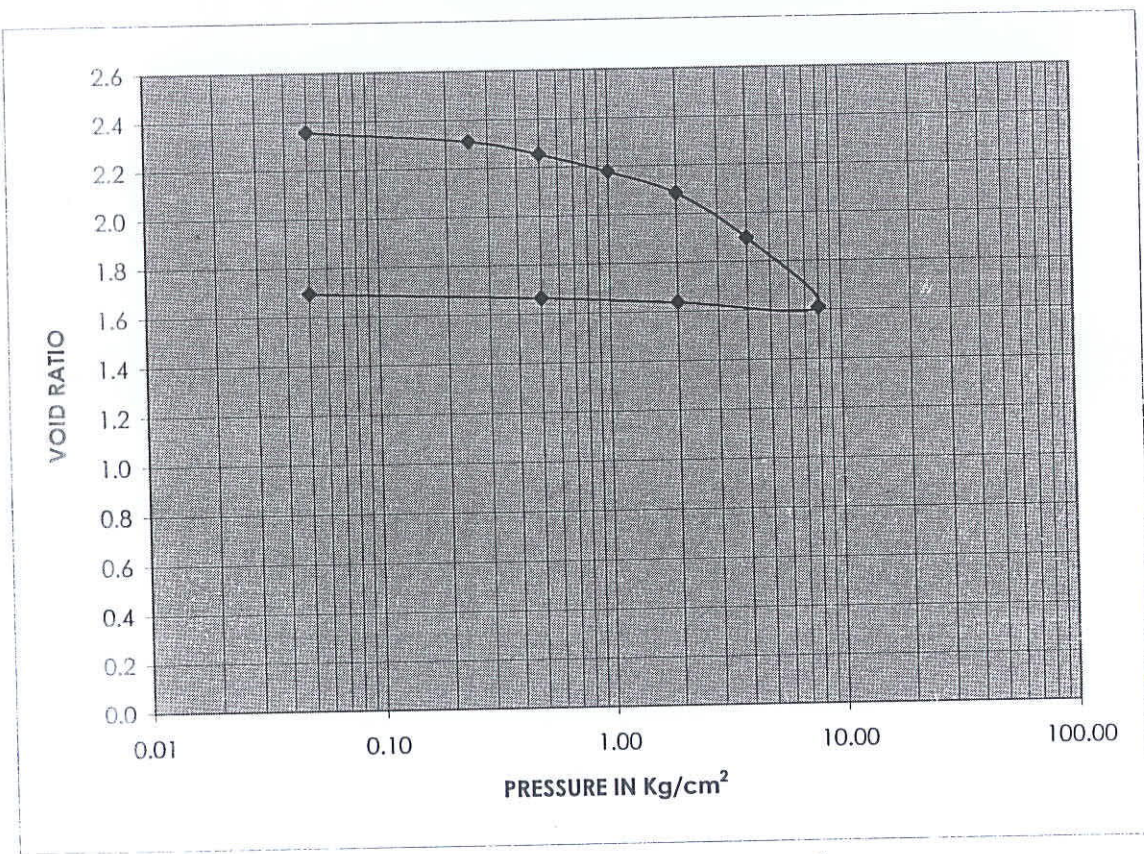


FIG (70)

	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p>T-1613</p>
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**Project: Geotechnical Investigation work for the proposed North Jetty**

**RESULTS OF CONSOLIDATION**



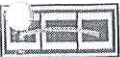

**VOIDS RATION VS LOG P CURVE**

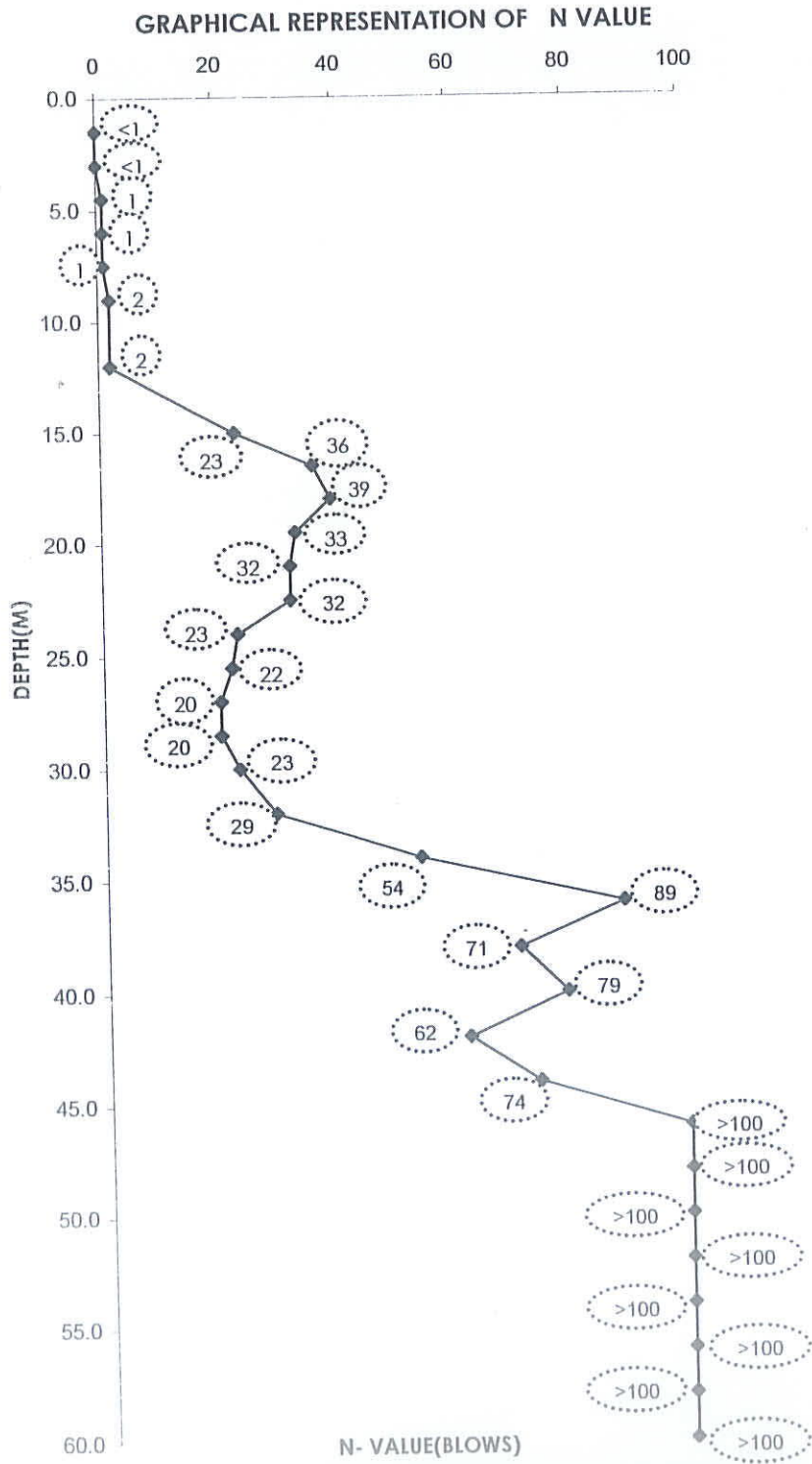
BH NO.	UDS-NO.	DEPTH(M)	Cc	eo
BH-03	3	12.00	0.95	2.38

Fig. 71



**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED OF NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-04</b>	Boring Started : 05.01.2013	 T-1613
		Type of Boring : Rotary	Boring Completed : 08.01.2013	
		Termination Depth : 60.00 M	High Tide Water : 8.70 M	
			Low Tide Water : 8.10 M	



BORE HOLE TERMINATED AT 60.0 M

FIG. 72

Geo Foundations Structures Pvt. Ltd

**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-04</b>	Boring Started : 05.01.2013	
		Type of Boring : Rotary	Boring Completed : 08.01.2013	
		Termination Depth : <b>60.0m</b>	Length of water column : 8.70m	
Co-ordinates: Lat - 9° 57' 36.29" N, Long - 76° 16' 44.18" E				

**LOCATION : INS VENDURUTHY(UNDER WATER BORING)**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS	
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>		
	8.70	WATER												
		EXISTING BED LEVEL		0.00										
	24.0	Clayey Silt with Traces of Sand (Grey)	CH	1.50	1.50-1.95	1	0	0	<1					
				3.00	3.00-3.45	1	0	0	<1					
				4.50	4.50-4.95	1	0	1	1					
				5.00	5.00-5.45	VST-1								
				6.00	6.00-6.45	1	0	1	1					
				7.50	7.50-7.95	1	0	1	1					
				8.00	8.00-8.45	VST-2								
				9.00	9.00-9.45	1	1	1	2					
				10.5	10.5-10.95	UDS-1								
				12.0	12.0-12.45	1	1	1	2					
				13.5	13.5-13.95	UDS-2								
				15.0	15.0-15.45	6	9	14	23					
				16.5	16.5-16.95	9	12	24	36					
				18.0	18.0-18.45	9	16	23	39					
	19.5	19.5-19.95	13	15	18	33								
	21.0	21.0-21.45	11	14	18	32								
	22.5	22.5-22.95	8	15	17	32								
	24.0	24.0-25.45	10	9	14	23								

(Contd.....fig. 3)

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Fig : 73



**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-04</b>	Boring Started : 05.01.2013	
		Type of Boring : <b>Rotary</b>	Boring Completed : 08.01.2013	
Termination Depth : <b>60.0m</b>	Length of water column : <b>8.70m</b>	Co-ordinates: Lat - 9° 57' 36.29" N, Long - 76° 16' 44.18" E		

**LOCATION : INS VENDURUTHY**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>	
	2.20	Clayey Silt with Traces Of Sand (Grey)	CH	25.5	25.5-25.95	9	11	11	22				
				27.0	27.0-27.45	8	9	11	20				
	19.8	Clayey Silty Sand (Grey)	SC	28.5	28.5-28.95	10	8	12	20				
				30.0	30.0-30.45	9	11	12	23				
				32.0	32.0-32.45	10	13	16	29				
				34.0	34.0-34.45	14	21	33	54				
				36.0	36.0-36.45	14	39	50	89				
				38.0	38.0-38.45	19	28	43	71				
				40.0	40.0-40.45	13	30	49	79				
				42.0	42.0-42.45	18	29	33	62				
				44.0	44.0-44.45	17	31	43	74				
				46.0	46.0-46.45	53	100	-	>100				27/45cm penetration
	14.0	Silty Sand (Y/Grey)	SM	48.0	48.0-48.45	41	81	19	100				32/45cm penetration
				50.0	50.0-50.45	63	100	-	>100				25/45cm penetration
				52.0	52.0-52.45	100	-	-	>100				15/45cm penetration
				54.0	54.0-54.45	100	-	-	>100				15/45cm penetration
				56.0	56.0-56.45	71	100	-	>100				21/45cm penetration
				58.0	58.0-58.45	66	100	-	>100				25/45cm penetration
				60.0	60.0-60.45	100	-	-	>100				15/45cm penetration

Termination Depth : 60.0m

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

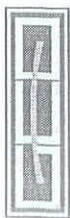
Fig : 74

Geo Foundations Structures Pvt Ltd

NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY		Date of Boring Started : 05.01.2013		Date of Boring Completed : 08.01.2013		Termination Depth : 60.00 M		Table No.13		T-1613								
LOCATION: NAVAL BASE		Hide Tide Water : 8.70 m		Date of Boring Started : 05.01.2013		Date of Boring Completed : 08.01.2013		Table No.13		T-1613								
LOCATION: NAVAL BASE		Low Tide water : 8.10 m		Date of Boring Started : 05.01.2013		Date of Boring Completed : 08.01.2013		Table No.13		T-1613								
N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAIN SIZE ANALYSIS (%) IS 2720(Part 5):1985			ATTEBERG'S LIMIT (%) IS 2720(Part 5):1985			UNIT WEIGHT (gm/cc)	DRY	SHEAR PARAMETERS-IS 2720(Part-13):1986					
					GRAVEL	SAND	SILT	CLAY	LL	PL				PI	WET	METHOD	C	Ø (°)
BOREHOLE BH/04																		
<1	1.50	SPT1	Clayey Silt with traces of sand (Grey)	CH	0	6	60	34	116	122	39	83						
<1	3.00	SPT2	Clayey Silt with traces of sand (Grey)	CH														
1	4.50	SPT3	Clayey Silt with traces of sand (Grey)	CH	0	5	60	35	110	119	37	82						
-	5.00	VST1	Clayey Silt with traces of sand (Grey)	CH											VST	0.03	-	
1	6.00	SPT4	Clayey Silt with traces of sand (Grey)	CH	0	4	66	30	112									
1	7.50	SPT5	Clayey Silt with traces of sand (Grey)	CH														
-	8.00	VST2	Clayey Silt with traces of sand (Grey)	CH											VST	0.04	-	
2	9.00	SPT6	Clayey Silt with traces of sand (G/Yellow)	CH														
-	10.5	UDS1	Clayey Silt with traces of sand (G/Yellow)	CH	0	2	61	37	110	115	38	77	2.38	1.32	0.63	UCS	0.12	-
2	12.0	SPT7	Clayey Silt with traces of sand (G/Yellow)	CH														
-	13.5	UDS2	Clayey Silt with traces of sand (G/Yellow)	CH	0	5	61	34	80	96	37	59	2.39	1.58	0.88	Triaxial	0.15	1
23	15.0	SPT8	Sandy Silty Clay with ravel (P/Grey)	CH	11	19	20	50	88									
36	16.5	SPT9	Clayey Silt traces of sand (Y/Grey)	CH	0	4	64	32	87									
39	18.0	SPT10	Clayey Silt traces of sand (Y/Grey)	CH	0	6	41	53	58	76	38	38						
33	19.5	SPT11	Clayey Silt traces of sand (Y/Grey)	CH														
32	21.0	SPT12	Clayey Silt traces of sand (Y/Grey)	CH	0	5	40	55										
32	22.5	SPT13	Clayey Silt traces of sand (Grey)	CH	0	7	43	50	62	68	34	34	2.40	1.66	1.02	UCS	1.25	-



**NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**



Hide Tide Water : 8.70 m  
Low Tide water : 8.10 m

Date of Boring Started : 05.01.2013  
Date of Boring Completed : 08.01.2013  
Termination Depth : 60.00 M

Table No. 14

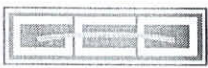

T-1613

N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAIN SIZE ANALYSIS (%) IS 2720 (Part-5): 1985				ATTERBERG'S LIMIT (%) IS 2720 (Part-5): 1985			SF G (IS 2720 Part-13): 1986	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS IS 2720 (Part-13): 1986			
					GRA - VEL	SAND	SILT	CLAY	LL	PL	PI		WET	DRY		WET	DRY	C
23	24.0	SPT14	Clayey Silt traces of Sand (Grey)	CH	0	5	47	48	60									
22	25.5	SPT15	Clayey Silt traces of Sand (Grey)	CH														
20	27.0	SPT16	Clayey Silty Sand (Grey)	SC	0	57	27	16	23	39	20	19						
20	28.5	SPT17	Clayey Silty Sand (Grey)	SC														
23	30.0	SPT18	Clayey Silty Sand (Grey)	SC	0	59	23	18	21									
29	32.0	SPT19	Clayey Silty Sand (Grey)	SC	0	62	20	18	27	39	19	20						
54	34.0	SPT20	Clayey Silty Sand (Grey)	SC														
89	36.0	SPT21	Clayey Silty Sand (Grey)	SC	0	59	26	15	24									
71	38.0	SPT22	Clayey Silty Sand (Grey)	SC														
79	40.0	SPT23	Clayey Silty Sand (Grey)	SC	0	60	22	18	22	40	19	21						
62	42.0	SPT24	Clayey Silty Sand with Gravel (Grey)	SC	4	60	25	11	21									
74	44.0	SPT25	Clayey Silty Sand with Gravel (Grey)	SC														
>100	46.0	SPT26	Silty Sand (Y/Grey)	SM	0	72	28	0	26	No Limit			2.60	1.98	1.57	DST	0	
>100	48.0	SPT27	Silty Sand (Y/Grey)	SM	0	75	25	0	25	No Limit								
>100	50.0	SPT28	Silty Sand (Y/Grey)	SM														
>100	52.0	SPT29	Silty Sand (P/Grey)	SM	0	74	26	0	23	No Limit								
>100	54.0	SPT30	Silty Sand (P/Grey)	SM														
>100	56.0	SPT31	Silty Sand (P/Grey)	SM	0	71	29	0	20	No Limit								
>100	58.0	SPT32	Silty Sand (P/Grey)	SM														

**BOREHOLE BH/04**

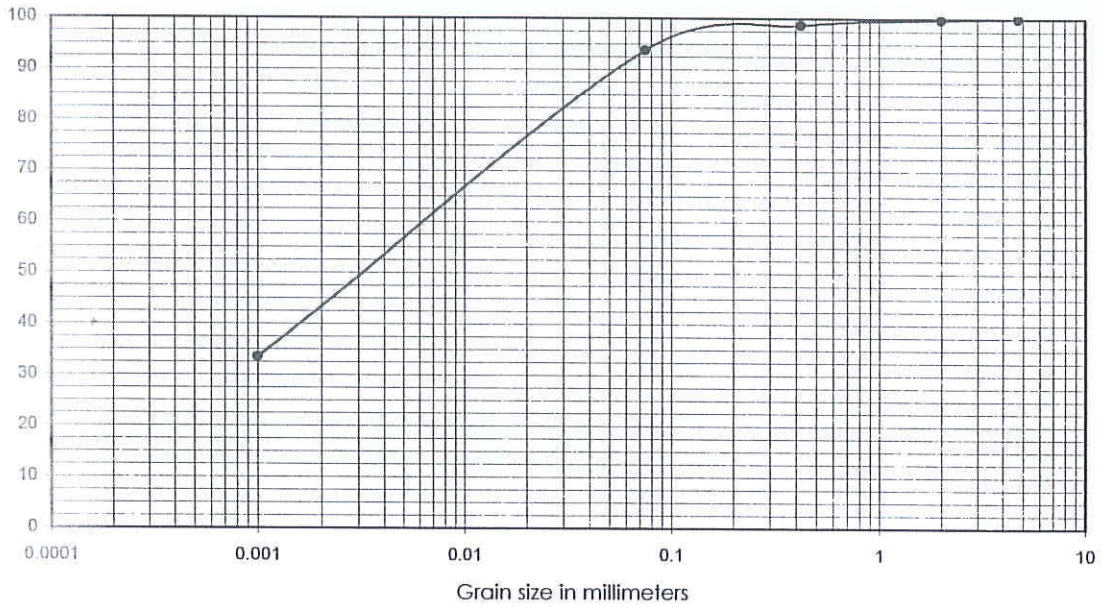
NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY		Date of Boring Started : 05.01.2013		Date of Boring Completed : 08.01.2013		Termination Depth : 60.00 M		Table No.15		T-1613									
LOCATION: NAVAL BASE		High Tide Water : 8.70 m		Low Tide Water : 8.10 m		GRAIN SIZE ANALYSIS(%) IS 2720(Part5):1985		ATTENBERG'S LIMIT(%) IS 2720(Part-5): 1985		SHEAR PARAMETERS-IS 2720(Part-13):1986									
N	DEPTH (M)	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAVEL	SAND	SILT	CLAY	NMC(%) IS 2720(Part2):1973	LL	PL	PI	SL (%) IS 2720(Part6): 1972	FSI (%) IS 2720(Part40):1977	SFG(is 2720(Part-3/sect1):1980	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS 2720(Part-13):1986		
															WET	DRY		C	Ø (°)
>100	60.0	SPT33 Silty Sand (P/Grey)	SM	0	79	21	0	18	No Limit					2.62	2.09	1.77	DST	0	39
<b>BOREHOLE BH/04</b>																			



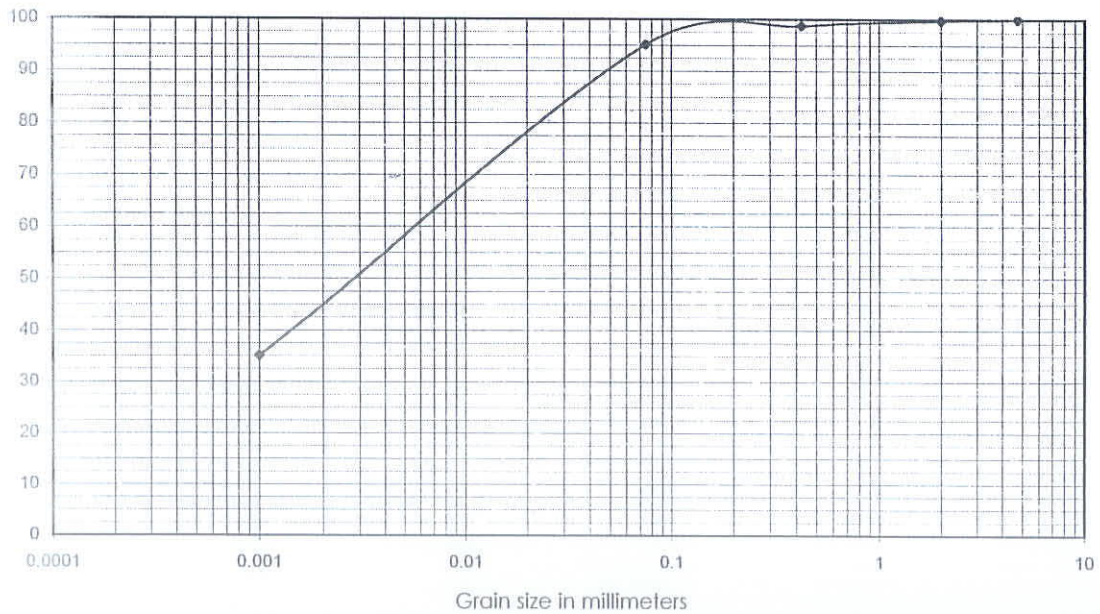
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



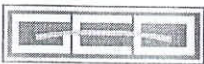

BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	1.50	CH	0	6	60	34			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	4.50	CH	0	5	60	35			

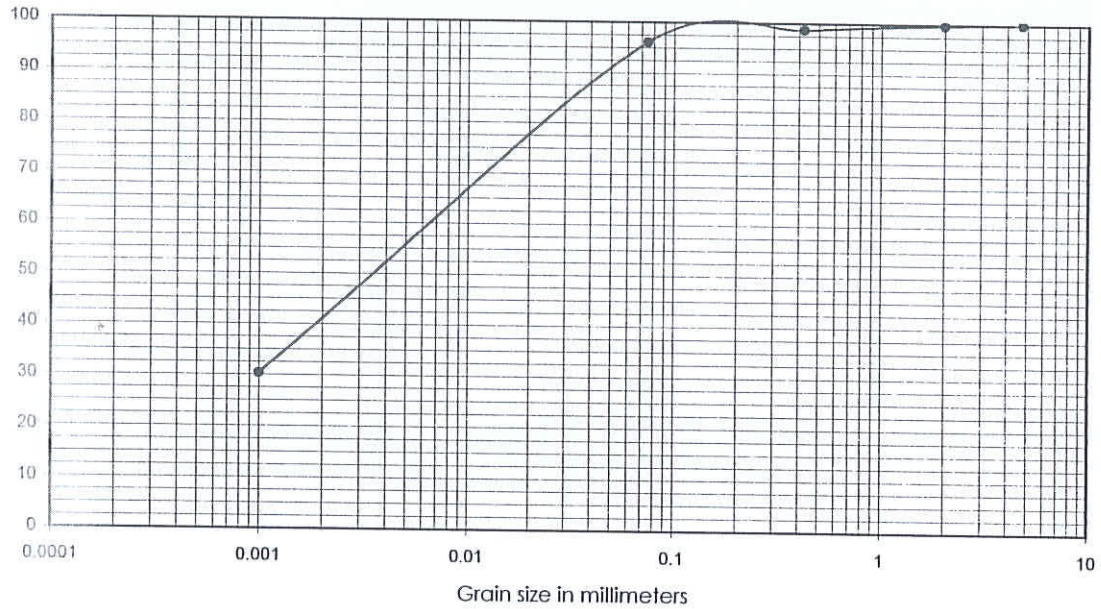
FIG. 75

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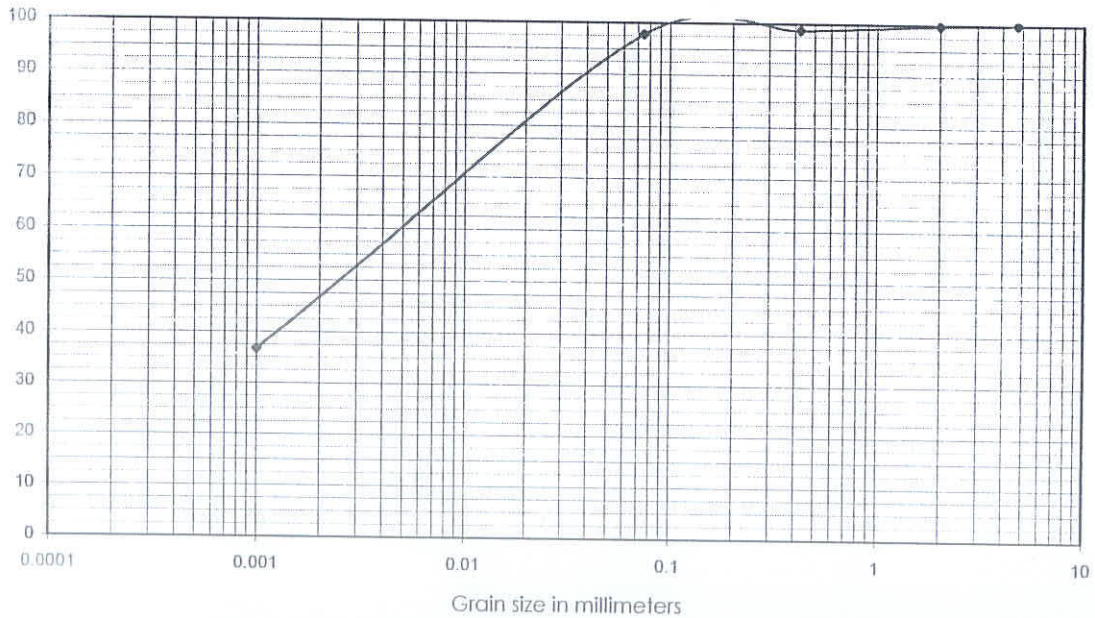
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	6.00	CH	0	4	66	30			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	10.50	CH	0	2	61	37			

FIG. 76

Geo Foundations Structures Pvt Ltd





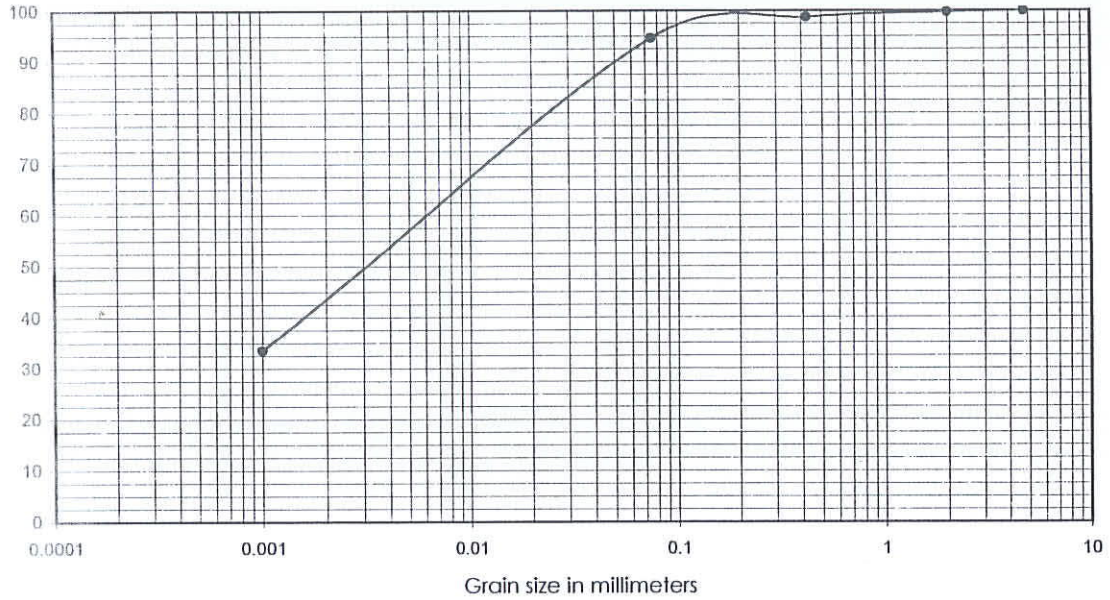
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



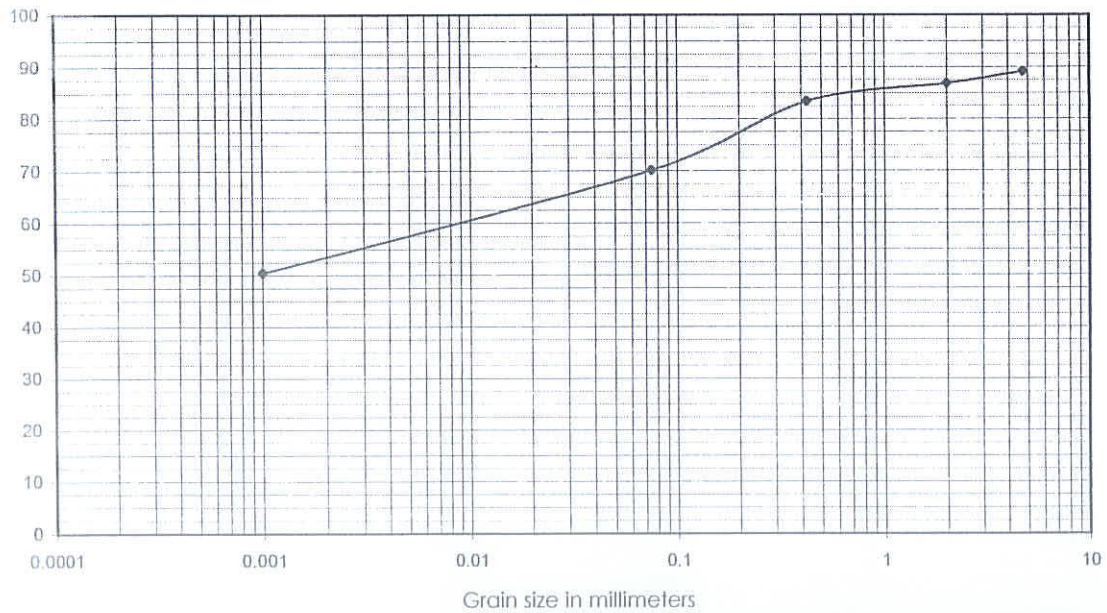
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



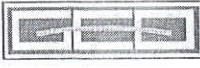

BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	13.50	CH	0	5	61	34			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	15.00	CH	11	19	20	50			

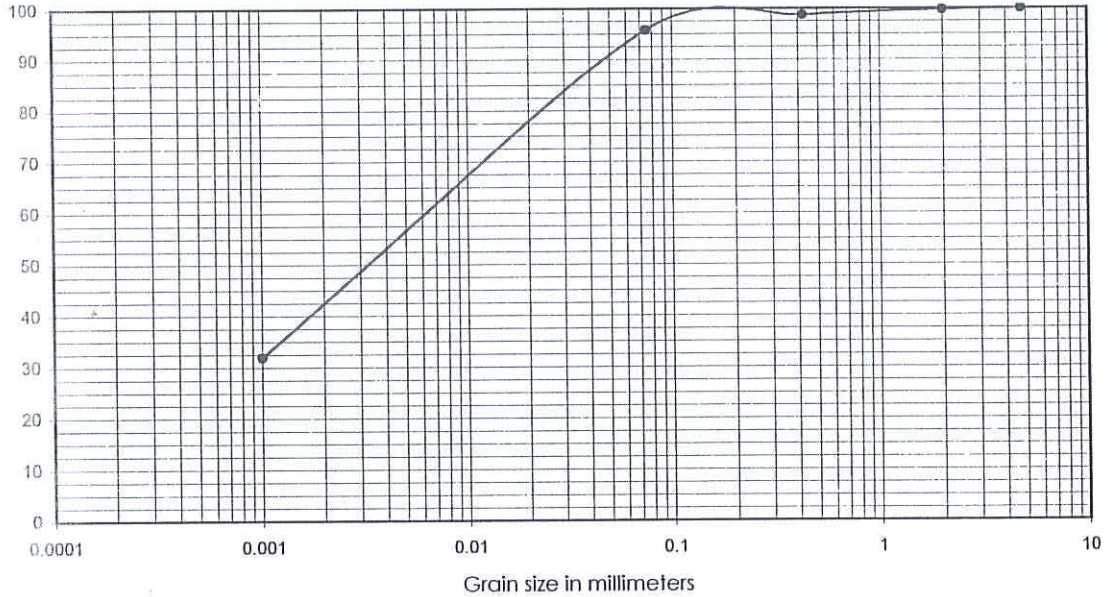
FIG. 77

Geo Foundations Structures Pvt Ltd

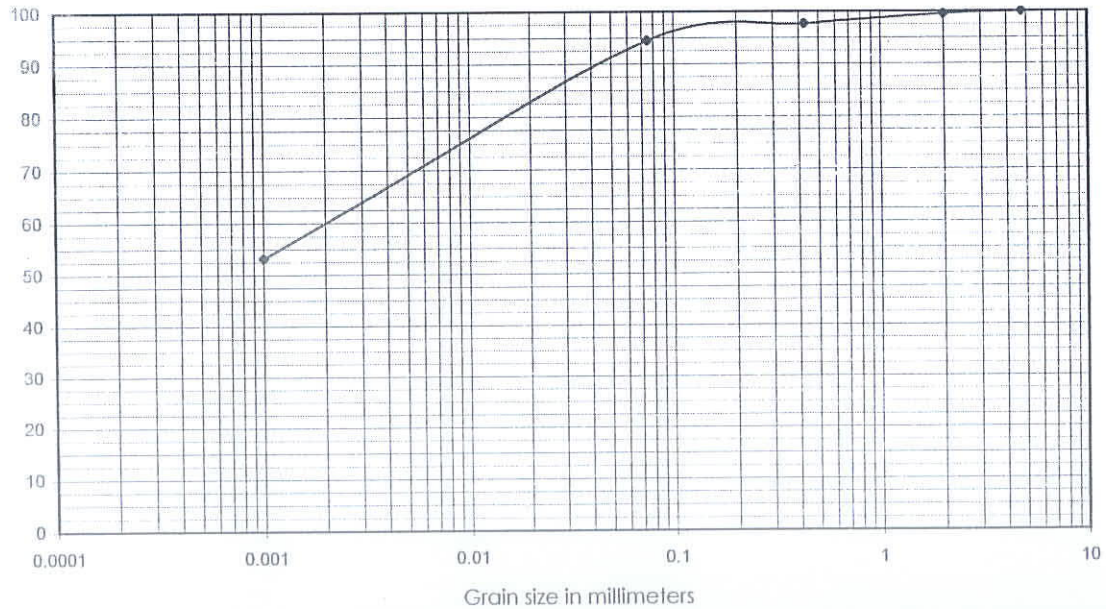
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	16.50	CH	0	4	64	32			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	18.00	CH	0	6	41	53			

FIG. 78

Geo Foundations Structures Pvt Ltd



	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**

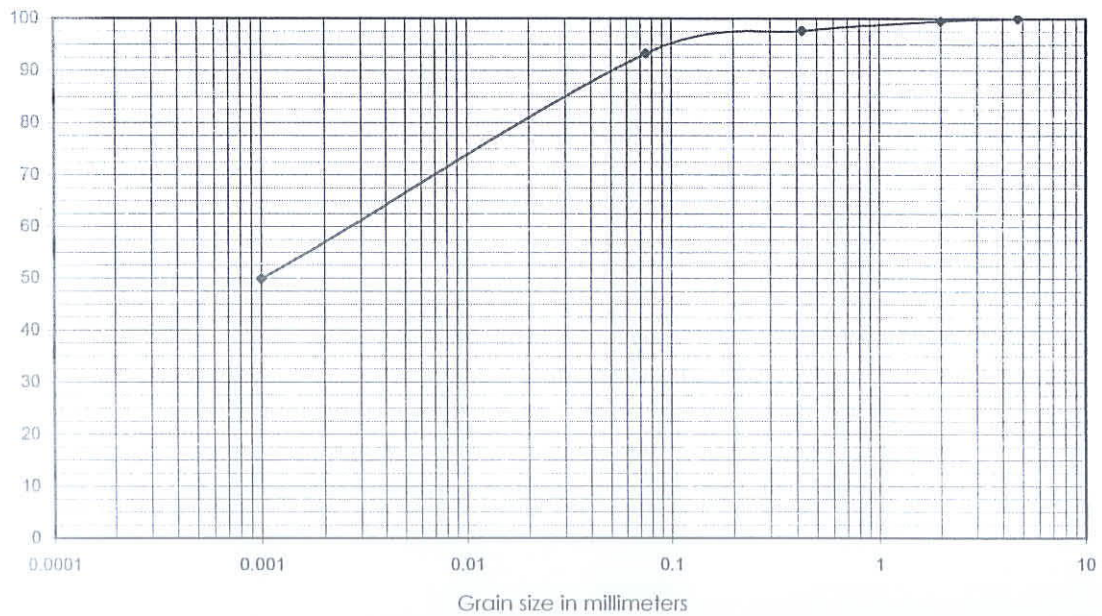
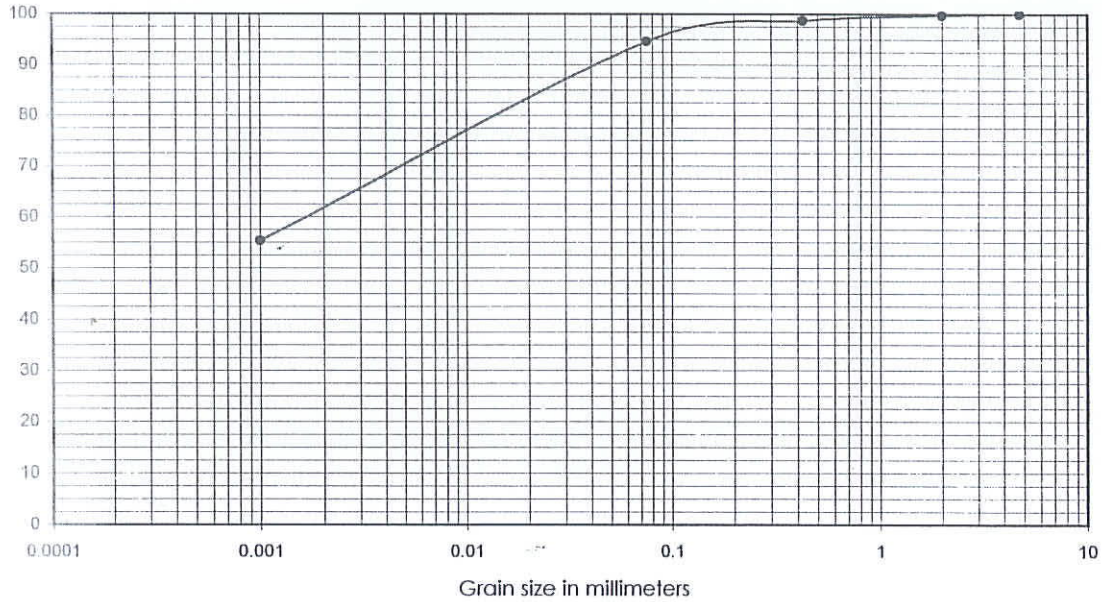


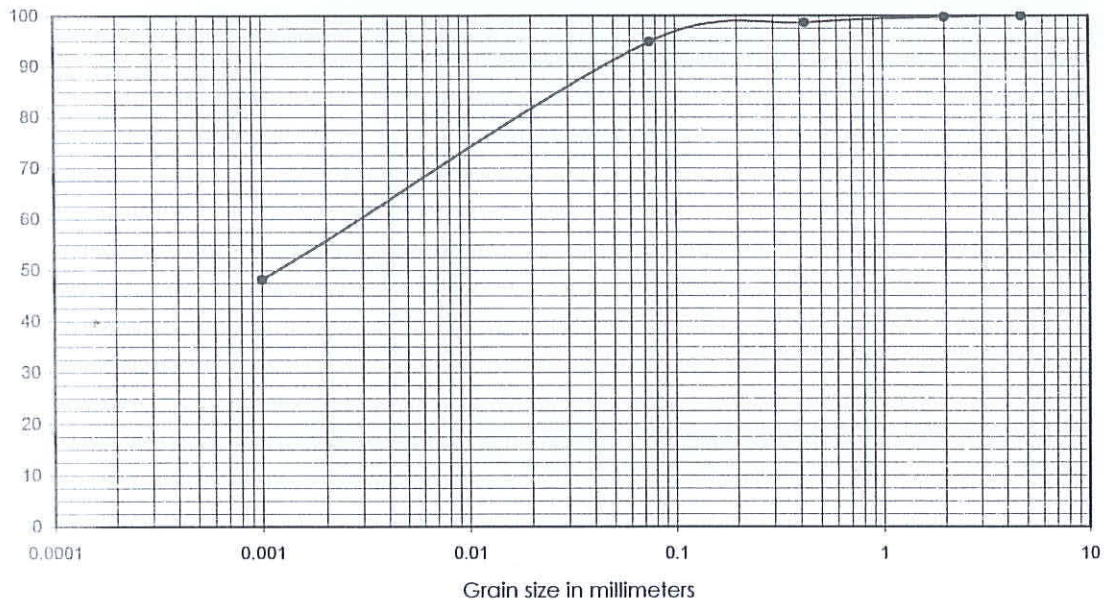
FIG. 79

Geo Foundations Structures Pvt Ltd

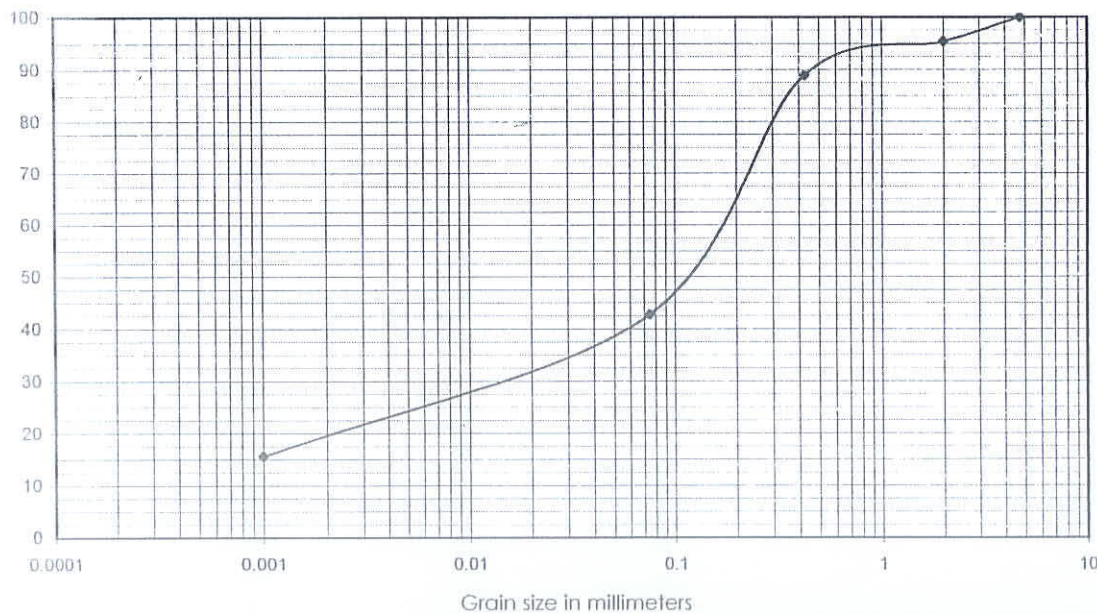
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p>T-1613</p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	24.00	CH	0	5	47	48			





BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	27.00	SC	0	57	27	16			

FIG. 80

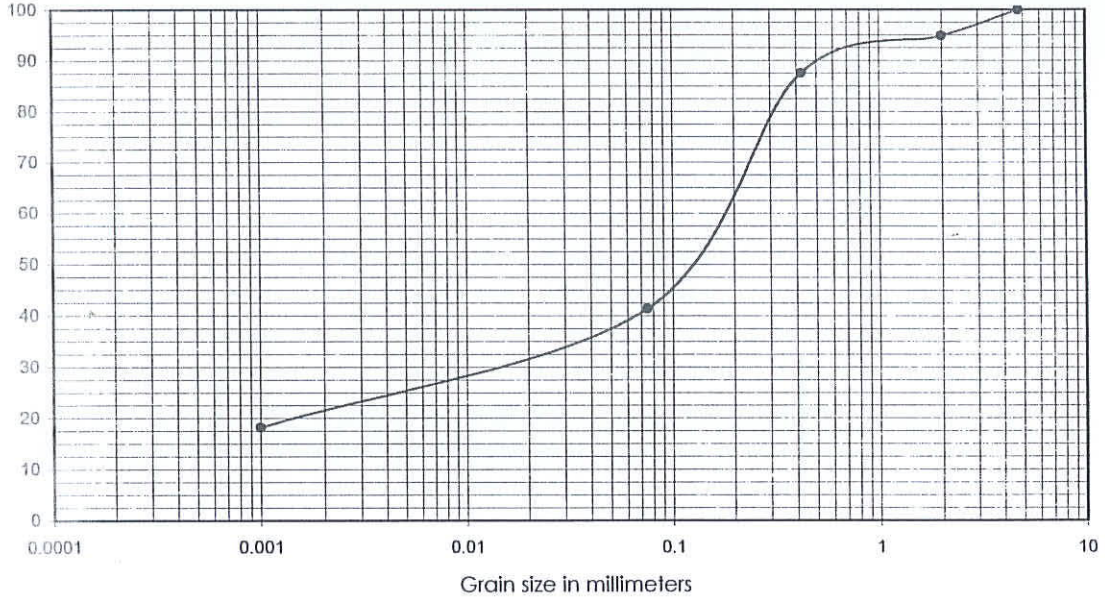
Geo Foundations Structures Pvt Ltd



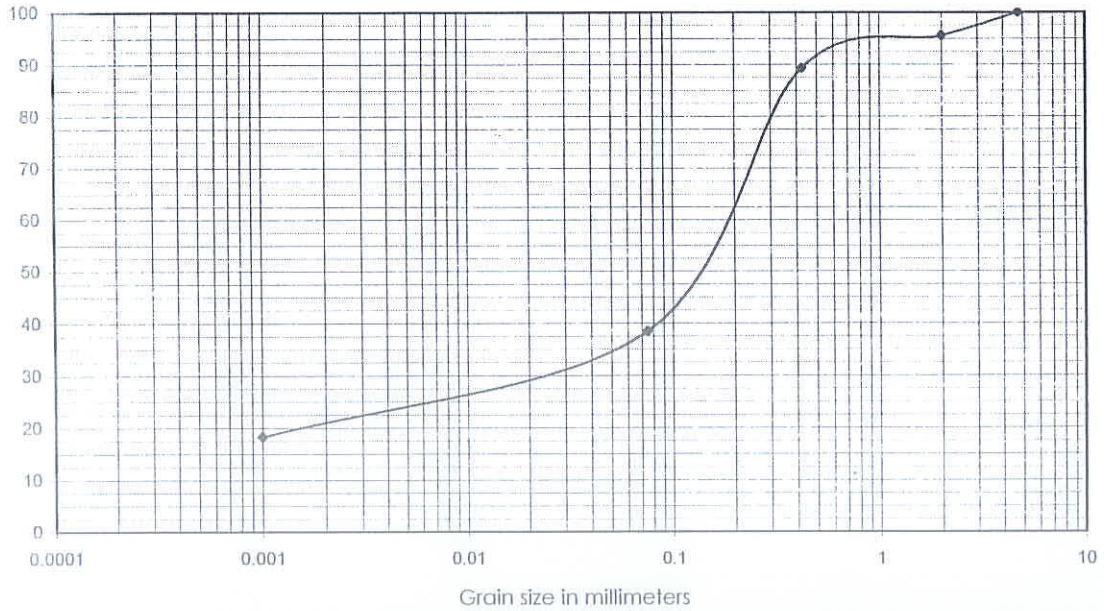
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



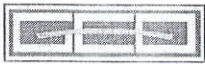
BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	30.00	SC	0	59	23	18			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	32.00	SC	0	62	20	18			

FIG. 81

Geo Foundations Structures Pvt Ltd



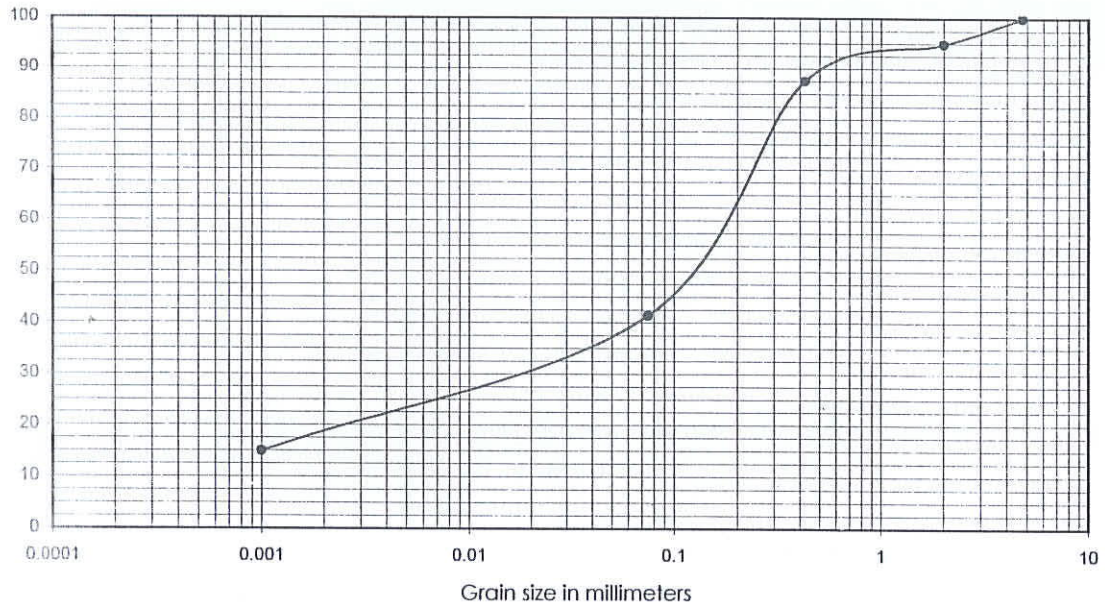
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



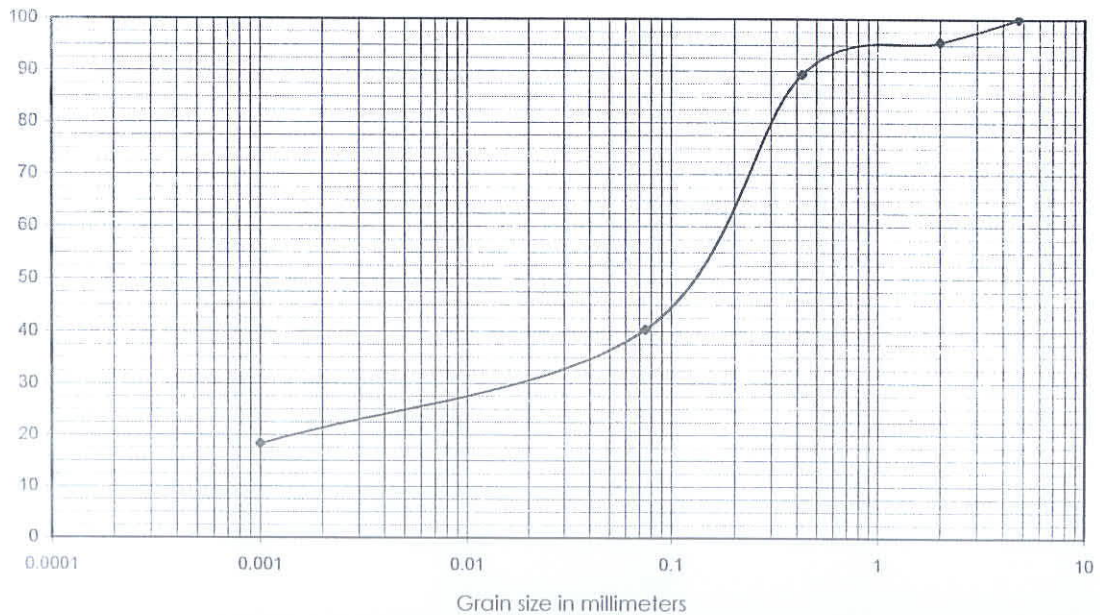
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	36.00	SC	0	59	26	15			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	40.00	SC	0	60	22	18			

FIG. 82

Geo Foundations Structures Pvt Ltd





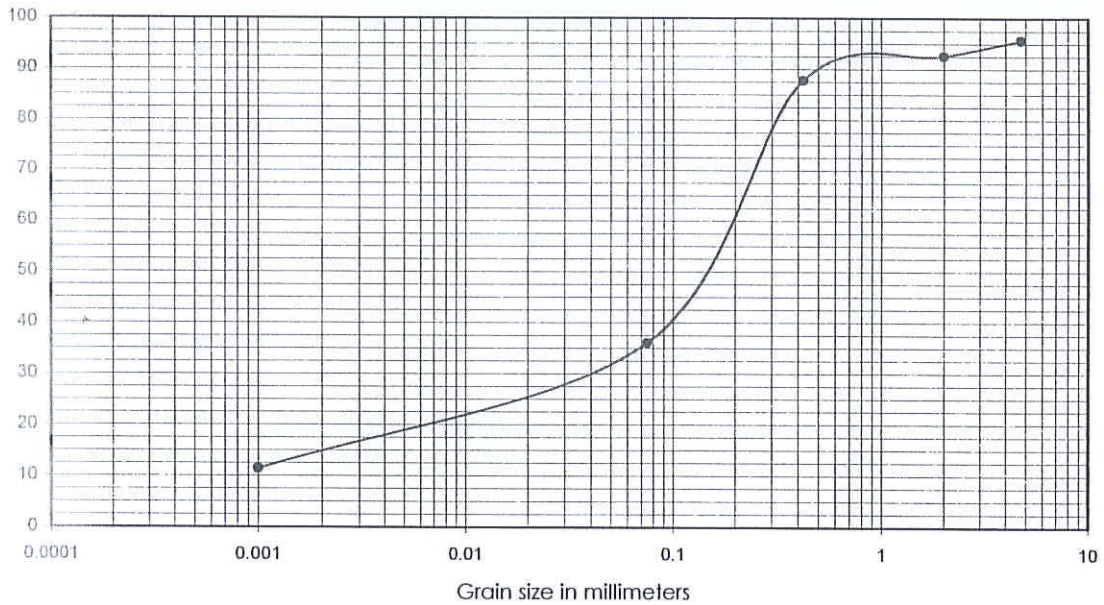
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



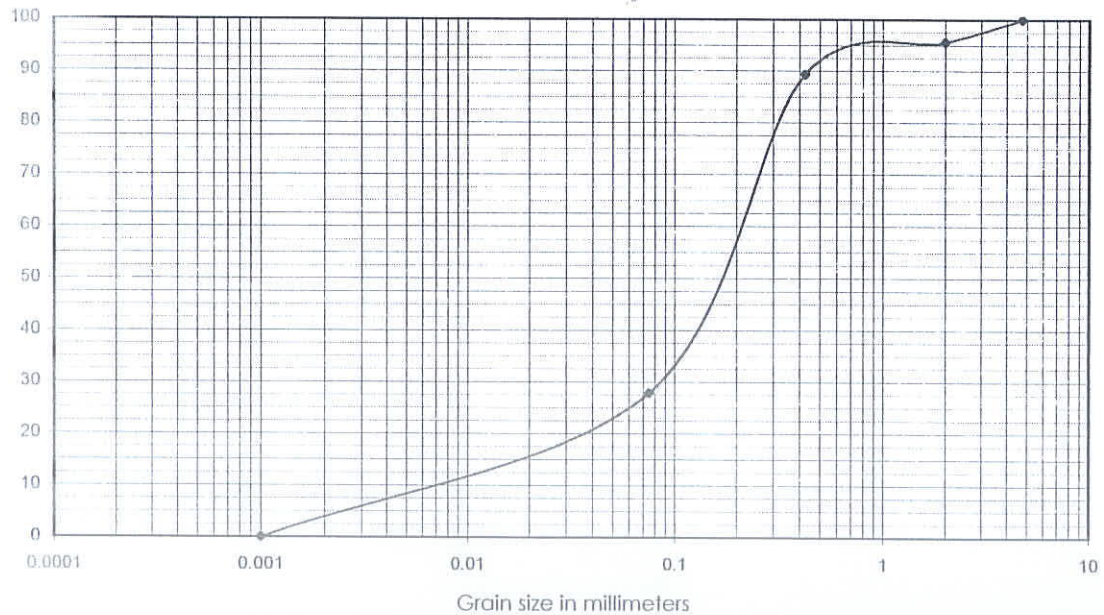
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST





BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	42.00	SC	4	60	25	11			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	46.00	SM	0	72	28	0			

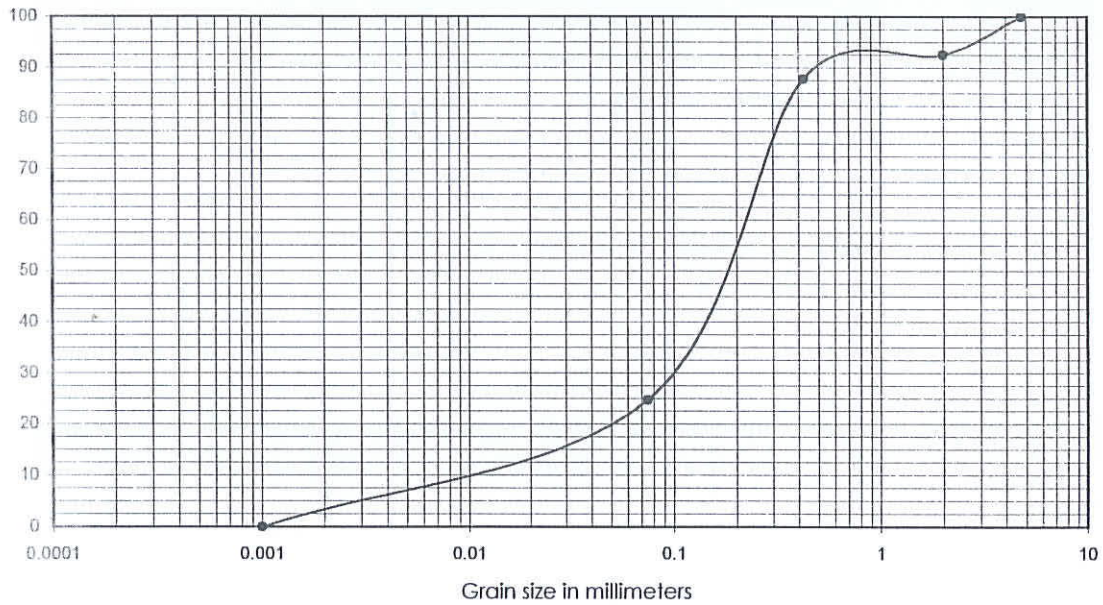
FIG. 83

Geo Foundations Structures Pvt Ltd

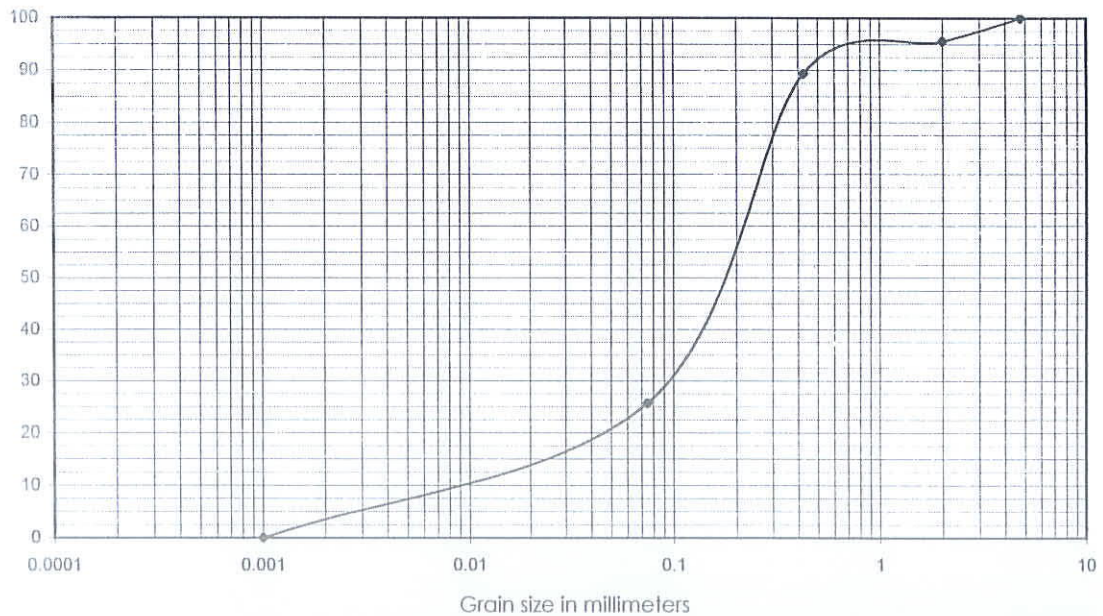
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	48.00	SM	0	75	25	0			

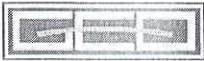


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	52.00	SM	0	74	26	0			

FIG. 84

Geo Foundations Structures Pvt Ltd





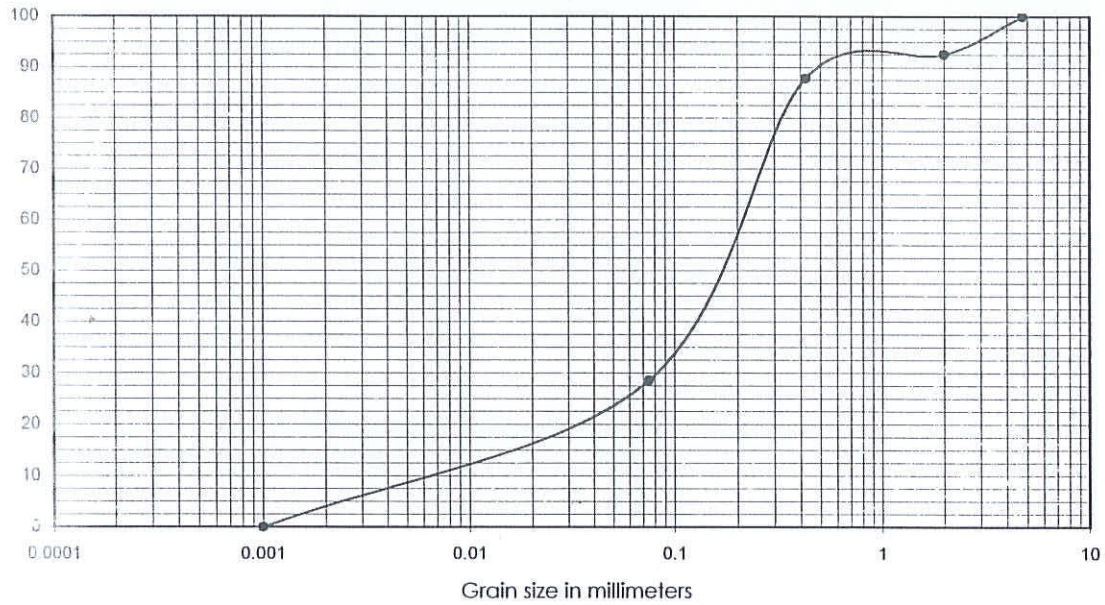
GEO FOUNDATIONS AND STRUCTURES PVT. LTD



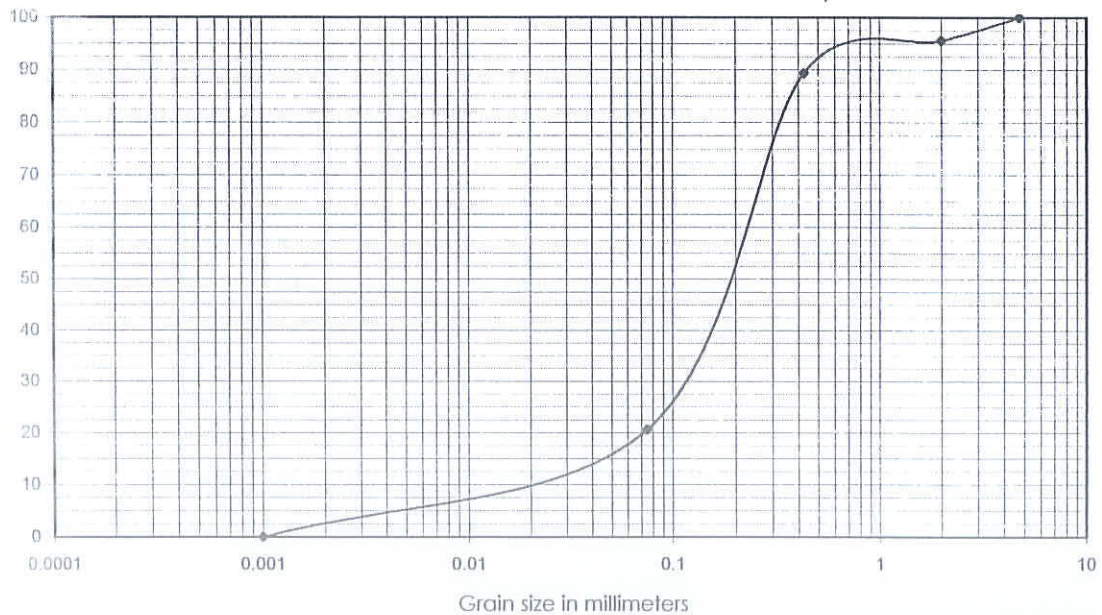
T-1613

PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE

GRAINSIZE ANALYSIS TEST



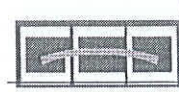
BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-04	56.00	SM	0	71	29	0			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-04	60.00	SM	0	79	21	0			

FIG. 85

Geo Foundations Structures PVI Ltd



TRI AXIAL TEST

BORE HOLE NO: BH-04  
SAMPLE NO : UDS-2  
DEPTH : 13.5 M  
 $C = 0.15 \text{ Kg/cm}^2$   $\phi = 1^\circ$

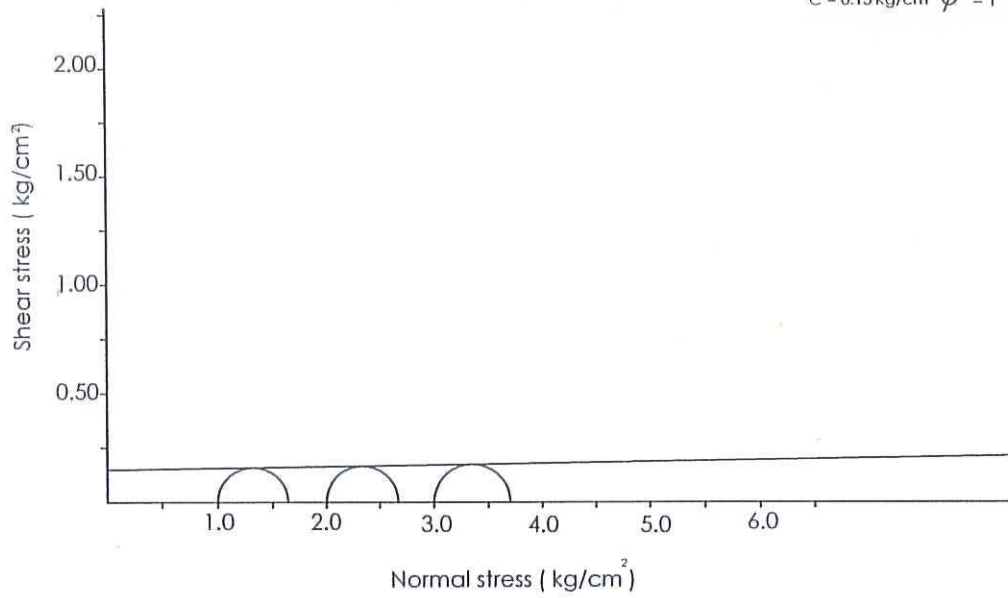


FIG (76)

DIRECT SHEAR TEST

BORE HOLE NO: BH-04  
SAMPLE NO : SPT26  
DEPTH : 46.0M  
 $C = 0 \text{ Kg/cm}^2$   $\phi = 37^\circ$

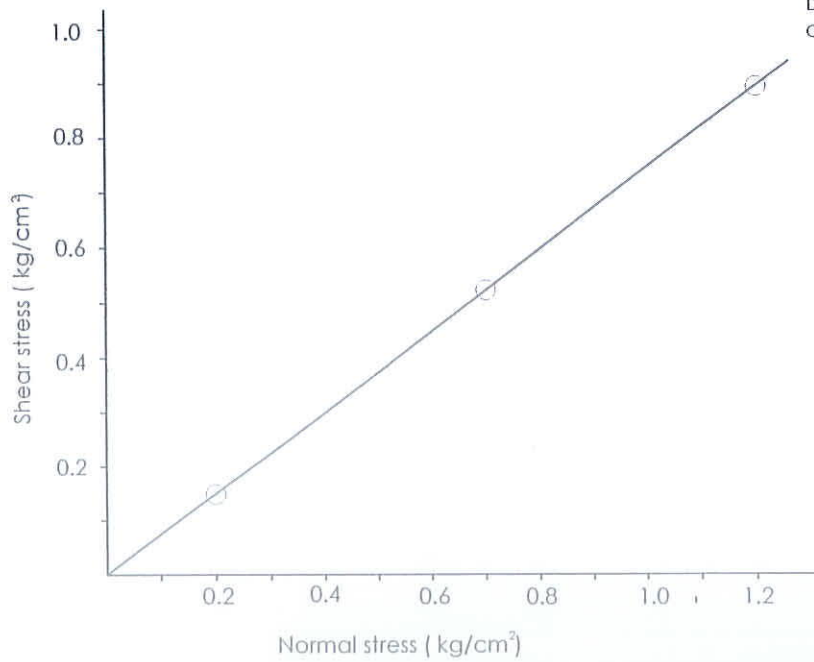


FIG (77)



Client: M/s. Naval Ship Repair Yard



DIRECT SHEAR TEST

BORE HOLE NO: BH-04  
SAMPLE NO : SPT33  
DEPTH : 60.0M  
C = 0 Kg/cm<sup>2</sup>  $\phi = 39^{\circ}$

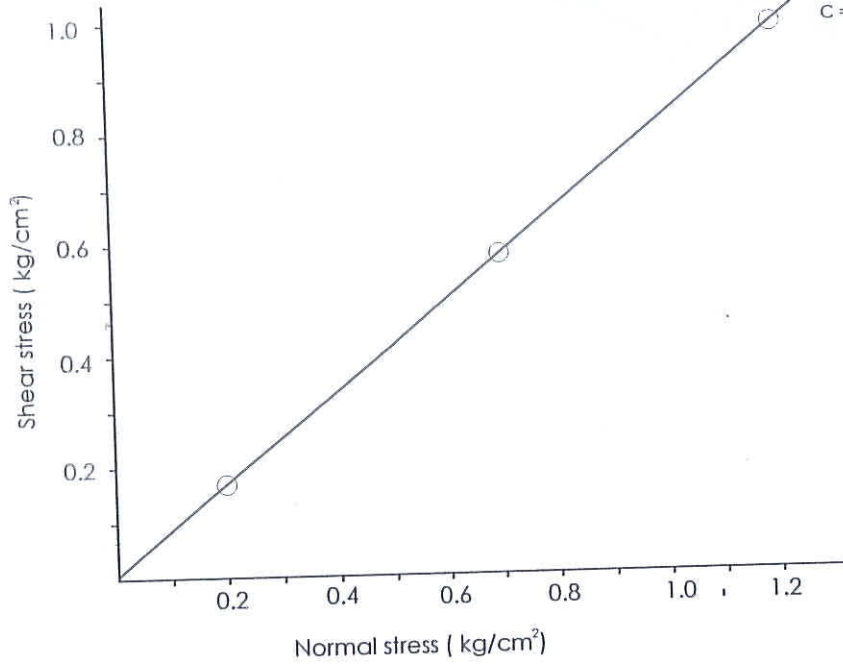
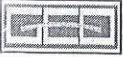

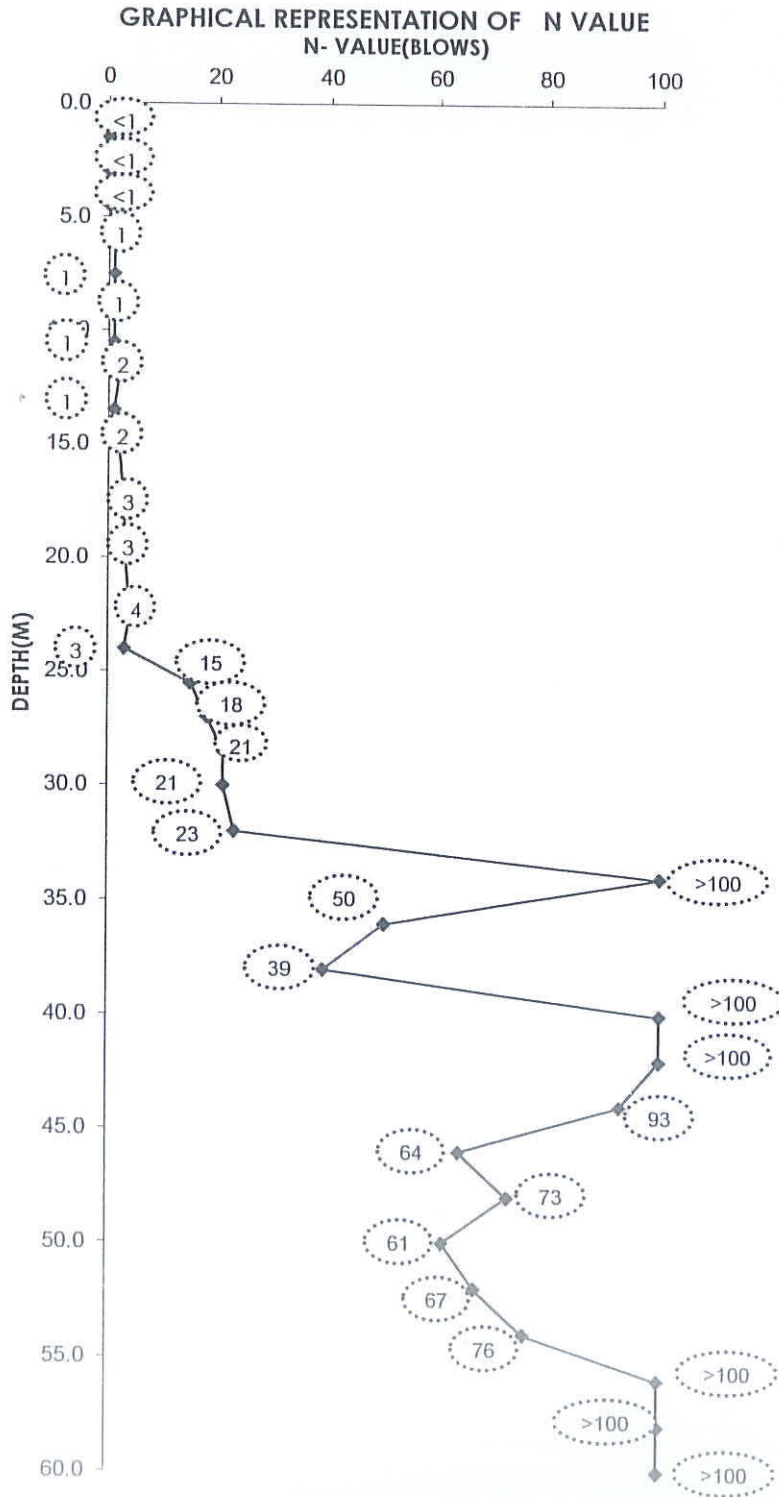


FIG (78)

**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-05</b>	Boring Started : 24.12.2012	 <b>T-1613</b>
		Type of Boring : Rotary	Boring Completed : 28.12.2012	
		Termination Depth : 60.00 M	High Tide Water : 2.40 M Low Tide Water : 1.80 M	



BORE HOLE TERMINATED AT 60.0 M  
FIG. 80  
Geo Foundations Structures Pvt. Ltd



**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-05</b>	Boring Started : 24.12.2012	
		Type of Boring : <b>Rotary</b>	Boring Completed : 28.12.2012	
		Termination Depth : <b>60.0m</b>	Length of water column : 2.40m	
Co-ordinates: Lat - 9° 57' 31.15" N, Long - 76° 16' 45.17" E				<b>T-1613</b>

**LOCATION : INS VENDURUTHY(UNDER WATER BORING)**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>	
	2.40	WATER EXISTING BED LEVEL		0.00									
	24.0	Clayey Silt with Traces of Sand (Grey)	CH	1.50	1.50-1.95	1	0	0	<1				
				3.00	3.00-3.45	1	0	0	<1				
				4.50	4.50-4.95	1	0	0	<1				
				6.00	6.00-6.45	1	0	1	1				
				7.50	7.50-7.95	1	0	1	1				
				9.00	9.00-9.45	1	0	1	1				
				10.0	10.0-10.45	VST-1							
				10.5	10.5-10.95	1	0	1	1				
				12.0	12.0-12.45	1	1	1	2				
				13.0	13.0-13.45	VST-2							
				13.5	13.5-13.95	1	0	1	1				
				15.0	15.0-15.45	1	1	1	2				
				16.5	16.5-16.95	UDS-1(SAMPLE SLIPPED)							
				18.0	18.0-18.45	1	1	2	3				
				19.5	19.5-19.95	1	2	1	3				
				21.0	21.0-21.45	UDS-2							
22.5	22.5-22.95	1	2	2	4								
24.0	24.0-25.45	1	1	2	3								

(Contd.....fig. 81)

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Fig : 81

**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED BUILDING FOR NSRY**

	<b>GEO FOUNDATIONS &amp; STRUCTURES PVT. LTD</b>	Bore Hole No : <b>BH-05</b>	Boring Started : 24.12.2012	
		Type of Boring : <b>Rotary</b>	Boring Completed : 28.12.2012	
		Termination Depth : <b>60.0m</b>	Length of water column : 2.40m	
Co-ordinates: Lat - 9° 57' 31.15" N, Long - 76° 16' 45.17" E				<b>T-1613</b>

**LOCATION : INS VENDORUTHY**

SOIL PROFILE	THICKNESS OF STRATA (m)	DESCRIPTION OF STRATA	IS CLASSIFICATION	DEPTH (m)	SAMPLES TEST DEPTH IN m	BLOWS/15cm			SPT "N"	Rock Core characteristics			REMARKS
						15cm	15cm	15cm		C.R (%)	R.Q.D (%)	UCS KG/CM <sup>2</sup>	
	9.10	Clayey Silt with Traces of Sand (Y/Grey)	CH	25.5	25.5-25.95	6	7	8	15				25/45cm penetration
				27.0	27.0-27.45	5	8	10	18				
				28.5	28.5-28.95	6	10	11	21				
				30.0	30.0-30.45	7	9	12	21				
				32.0	32.0-32.45	8	10	13	23				
				34.0	34.0-34.45	70	100	-	>100				
	3.40	Silty Sand with Gravel (Y/Grey)	SM	36.0	36.0-36.45	16	23	27	50				
				38.0	38.0-38.45	23	18	21	39				
	2.00	Silty Clayey Sand with Gravel (Br/Grey)	SC	40.0	40.0-40.45	59	100	-	>100			30/45cm penetration	
				42.0	42.0-42.45	71	100	-	>100			27/45cm penetration	
	8.60	Fine Sand (P/Grey)	SP-SM	44.0	44.0-44.45	31	42	51	93				
				46.0	46.0-46.45	51	23	41	64				
				48.0	48.0-48.45	21	30	43	73				
				50.0	50.0-50.45	19	24	37	61				
				52.0	52.0-52.45	17	29	38	67				
				54.0	54.0-54.45	19	30	46	76				
	7.90	Sandy Silty Clay with Gravel (Grey)	CI	56.0	56.0-56.45	31	60	40	>100			40/45cm penetration	
		Sandy Silty Clay (Grey)		58.0	58.0-58.45	44	76	24	>100			32/45cm penetration	
				60.0	60.0-60.45	57	100	-	>100			30/45cm penetration	

Termination Depth : 60.0m

Note : UDS- Undisturbed Sample

SPT "N"-Standard Penetration Test "N"

Fig : 82

Geo Foundations Structures Pvt Ltd





**NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY**



T-1613



**Table No.16**

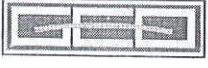

Hide Tide Water : 2.40 M  
 Low Tide water : 1.80 M  
 Date of Boring Started : 24.12.2012  
 Date of Boring Completed : 28.12.2012  
 Termination Depth : 60.00 M

N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAIN SIZE ANALYSIS (%) IS 2720(Part-5):1985				ATTERBERG'S LIMIT (%) IS 2720(Part-5): 1985			SFG (IS 2720(Part-3/Sec1):1980)	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS-IS 2720(Part-13):1986	
					GRA - VEL	SAND	SILT	CLAY	LL	PL	PI		WET	DRY		METHOD
<b>BOREHOLE BH/5</b>																
<1	1.50	SPT1	Clayey Silt with traces of Sand (Grey)	CH	0	2	70	28	138	146	37	109				
<1	3.00	SPT2	Clayey Silt with traces of Sand (Grey)	CH	0	5	65	30	135							
<1	4.50	SPT3	Clayey Silt with traces of Sand (Grey)	CH												
1	6.00	SPT4	Clayey Silt with traces of Sand (Grey)	CH	0	3	64	34	122							
1	7.50	SPT5	Clayey Silt with traces of Sand (Grey)	CH												
1	9.00	SPT6	Clayey Silt with traces of Sand (Grey)	CH	0	5	65	30	115	128	35	93				
-	10.0	VST1	Clayey Silt with traces of Sand (Grey)	CH										VST	0.024	-
1	10.5	SPT7	Clayey Silt with traces of Sand (Grey)	CH	0	4	60	36								
2	12.0	SPT8	Clayey Silt with traces of Sand (Grey)	CH												
-	13.0	VST2	Clayey Silt with traces of Sand (Grey)	CH											VST	0.04
1	13.5	SPT9	Clayey Silt with traces of Sand (Grey)	CH	0	3	64	33	118							
2	15.0	SPT10	Clayey Silt with traces of Sand (Grey)	CH	0	3	60	37	110	120	33	87				
-	16.5	UDS1	Clayey Silt with traces of Sand (Grey)-sample slipped	CH												
3	18.0	SPT11	Clayey Silt with traces of Sand (Y/Grey)	CH	0	4	57	39	108							
3	19.5	SPT12	Clayey Silt with traces of Sand (Y/Grey)	CH												

NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY		Date of Boring Started : 24.12.2012		Table No..17													
LOCATION: NAVAL BASE		Date of Boring Completed : 28.12.2012		T-1613													
SOIL DESCRIPTION		Termination Depth : 60.00 M		SHEAR PARAMETERS-IS													
N	DEPTH(M)	SAMPLE	I.S. CLASSIFICATION	GRAIN SIZE ANALYSIS(%) IS 2720(Part5):1985			UNIT WEIGHT (gm/cc)	DRY	METHOD								
				GRAVEL	SAND	SILT				CLAY							
			ATTENBERG'S LIMIT(%) IS 2720(Part-5):1985			2720(Part-13):1986	C	Ø (°)									
			LL	PL	PI												
			SL (%) IS 2720(Part-6):1972			2720(Part-14):1977	2720(Part-15):1980	UCS									
			FSI (%) IS 2720(Part-10):1977														
BOREHOLE BH/5																	
-	21.0	UDS2	CH	0	7	64	29	104	110	38	72	2.37	1.49	0.73	Triaxial	0.12	-
4	22.5	SPT13	CH														
3	24.0	SPT14	CH														
15	25.5	SPT15	CH	0	10	51	40	52									
18	27.0	SPT16	CH	0	8	50	42	50	78	35	43	2.40	1.61	1.07	UCS	0.60	-
21	28.5	SPT17	CH														
21	30.0	SPT18	CH	0	12	50	38	56									
23	32.0	SPT19	CH	0	10	50	40	55	74	32	42						
>100	34.0	SPT20	CH														
50	36.0	SPT21	SM	1	62	37	0	18	No Limit								
39	38.0	SPT22	SC	13	61	11	16	17	38	NP							
>100	40.0	SPT23	SP-SM	0	91	9	0	12	No Limit			2.64	2.06	1.84	DST	0	38
>100	42.0	SPT24	SP-SM														
93	44.0	SPT25	SP-SM	0	92	8	0	15	No Limit								
64	46.0	SPT26	SP-SM														
73	48.0	SPT27	CI	5	38	25	32	30	39	23	16	2.43	1.88	1.45	UCS	1.65	-

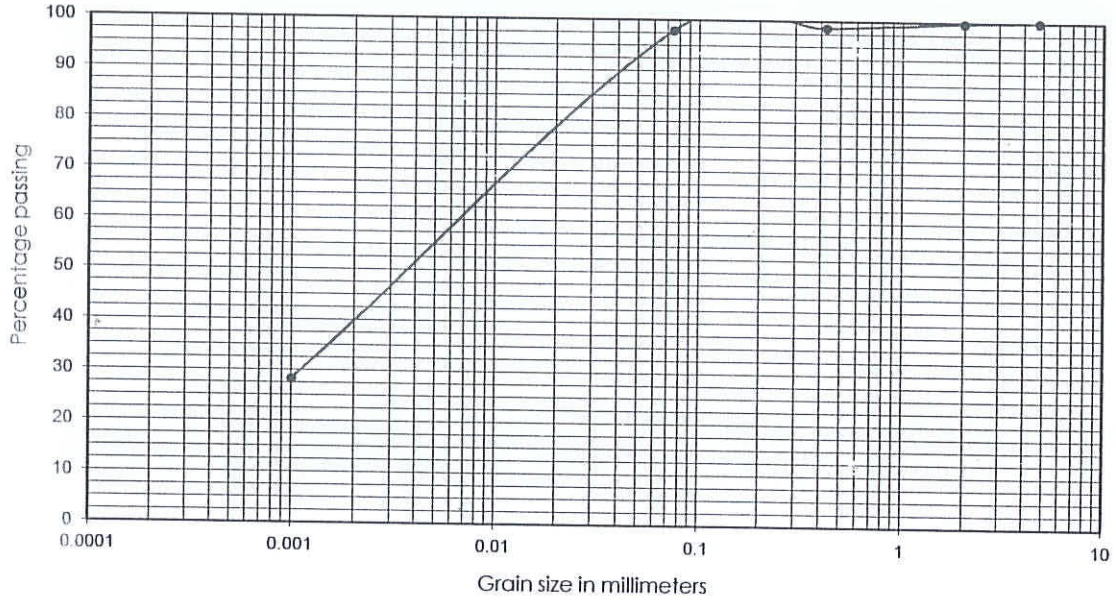


																						
NAME OF WORK: SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY																						
LOCATION: NAVAL BASE		Hide Tide Water : 2.40 M	Date of Boring Started : 24.12.2012																			
		Low Tide water : 1.80 M	Date of Boring Completed : 28.12.2012																			
			Termination Depth : 60.00 M																			
N	DEPTH (M)	SAMPLE	SOIL DESCRIPTION	I.S. CLASSIFICATION	GRAVEL	GRAIN SIZE ANALYSIS IS 2720(Part 5):1985			SILT	CLAY	NMC (%) IS 2720 (Part 2):1973	ATTERBERG'S LIMIT (%) IS 2720(Part 5): 1985			SL (%) IS 2720(Part 6): 1972	FSI (%) IS 2720 (Part 40):1977	SPG(S 2720(Part 3/sec 1):1980	UNIT WEIGHT (gm/cc)		SHEAR PARAMETERS- IS 2720(Part-13):1986		
						SAND	SILT	CLAY				LL	PL	PI				WET	DRY		METHOD	C
<b>BOREHOLE BH/5</b>																						
61	50.0	SPT28	Sandy Silty Clay (Grey)	CI	0	39	41	21	36													
67	52.0	SPT29	Sandy Silty Clay (Grey)	CI																		
76	54.0	SPT30	Sandy Silty Clay (Grey)	CI	0	40	40	20														
>100	56.0	SPT31	Silty Sand (Grey)	SM	0	85	15	0	15	No Limit												
>100	58.0	SPT32	Silty Sand (Grey)	SM																		
>100	60.0	SPT33	Silty Sand (Grey)	SM	0	88	12	0	16	No Limit								2.11	1.82	DST	0	39

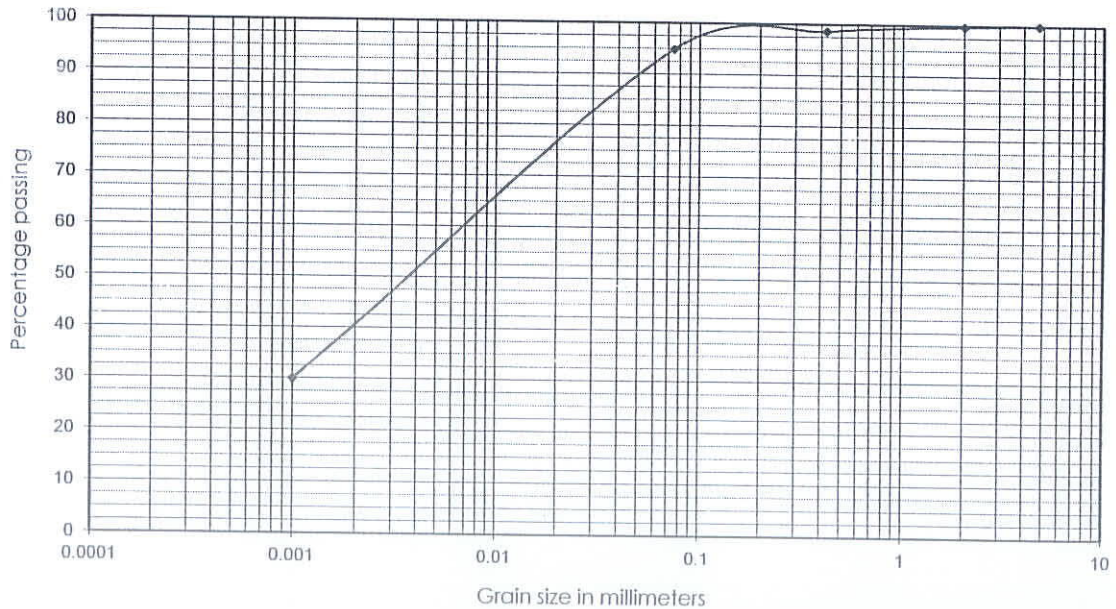
	<p><b>GEO FOUNDATIONS AND STRUCTURES PVT. LTD</b></p>	 <p><b>T-1613</b></p>
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**PROJECT : SOIL INVESTIGATION WORK FOR THE PROPOSED NORTH JETTY AT NAVAL BASE**

**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	1.50	CH	0	2	70	28			





BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	3.00	CH	0	5	65	30			

FIG. 3

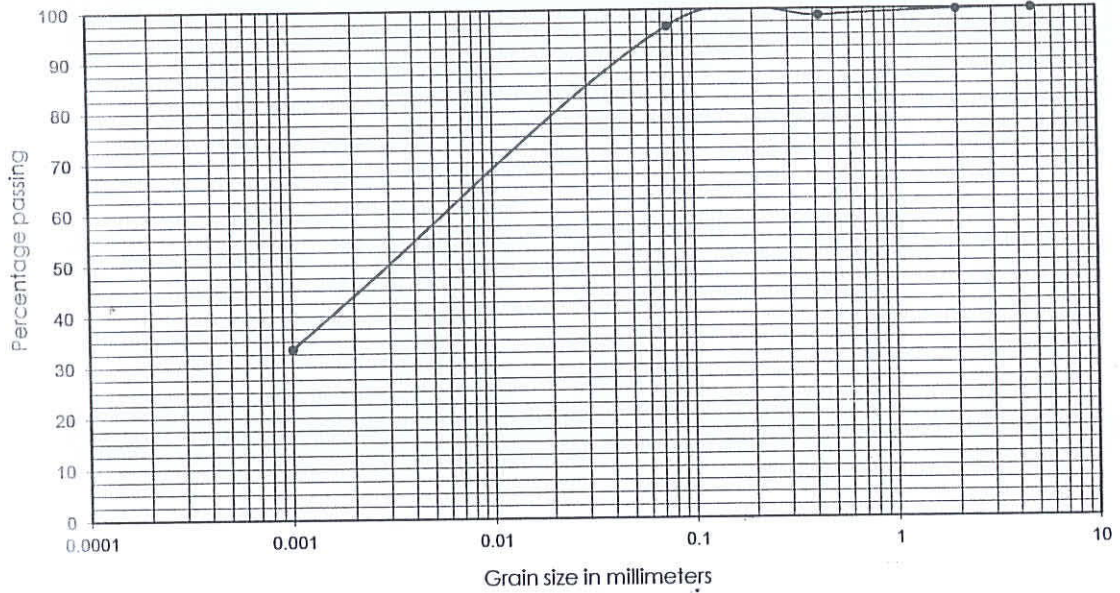
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**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	6.00	CH	0	3	63	34			

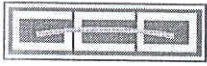


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	9.00	CH	0	5	65	30			

FIG. 94

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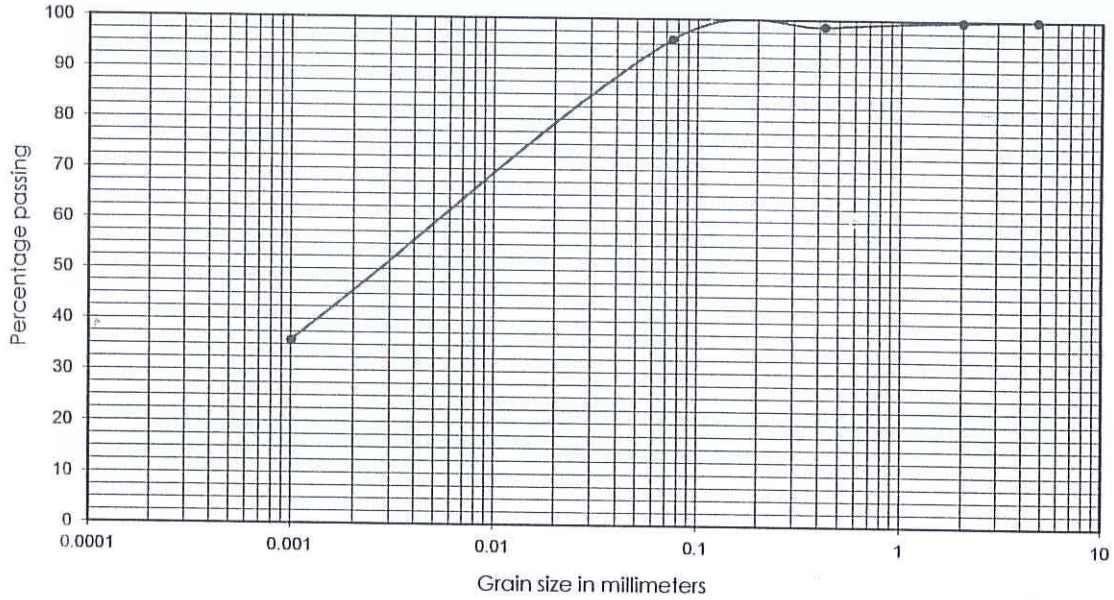
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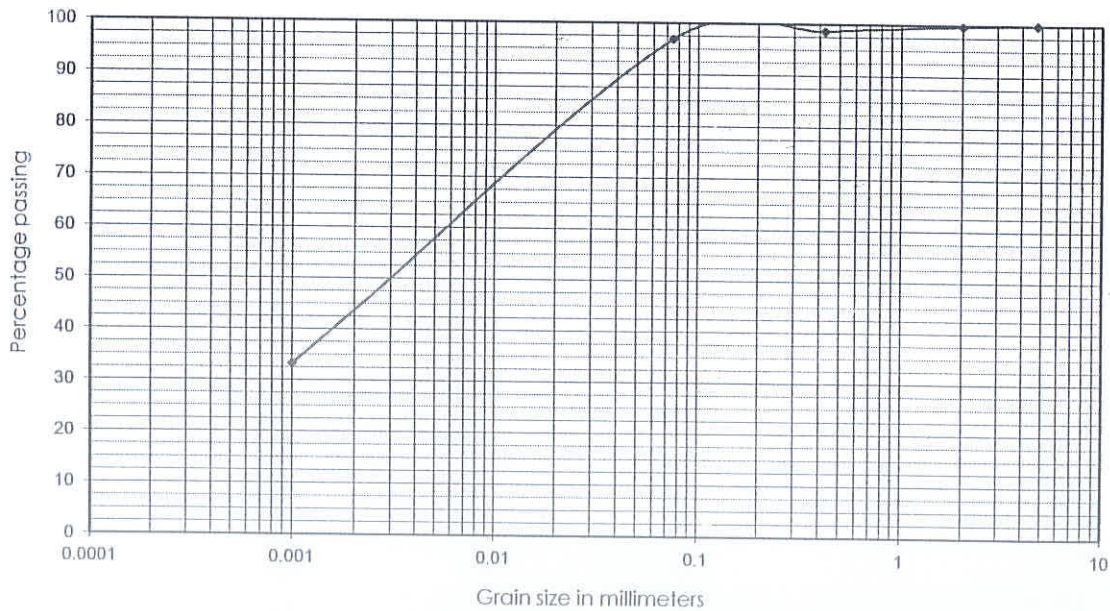
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BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	10.50	CH	0	4	60	36			

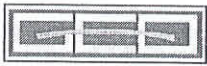


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	13.50	CH	0	3	64	33			

FIG.95

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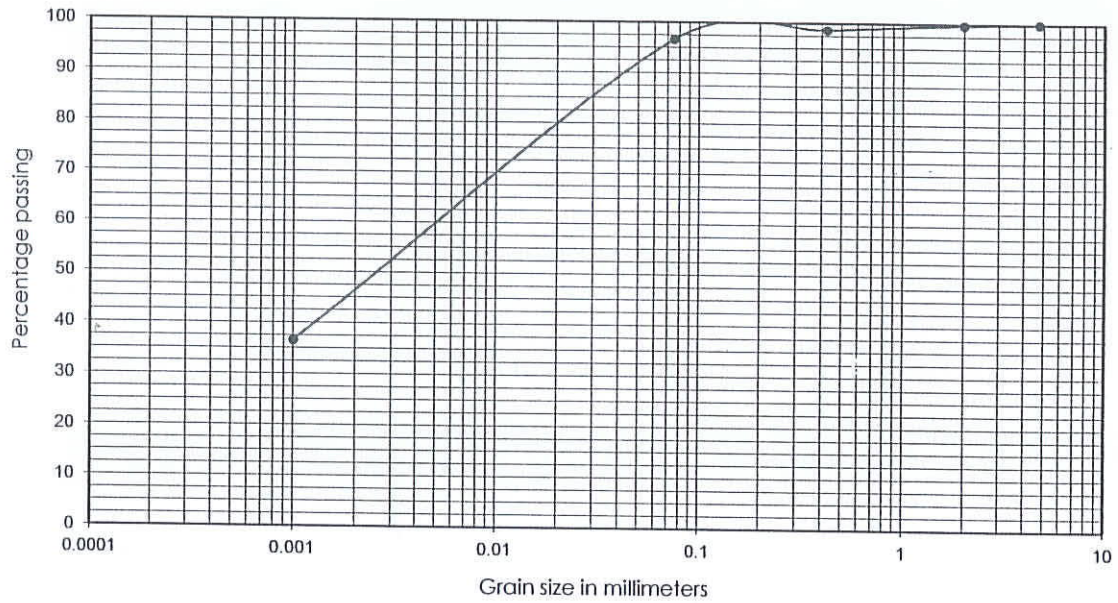
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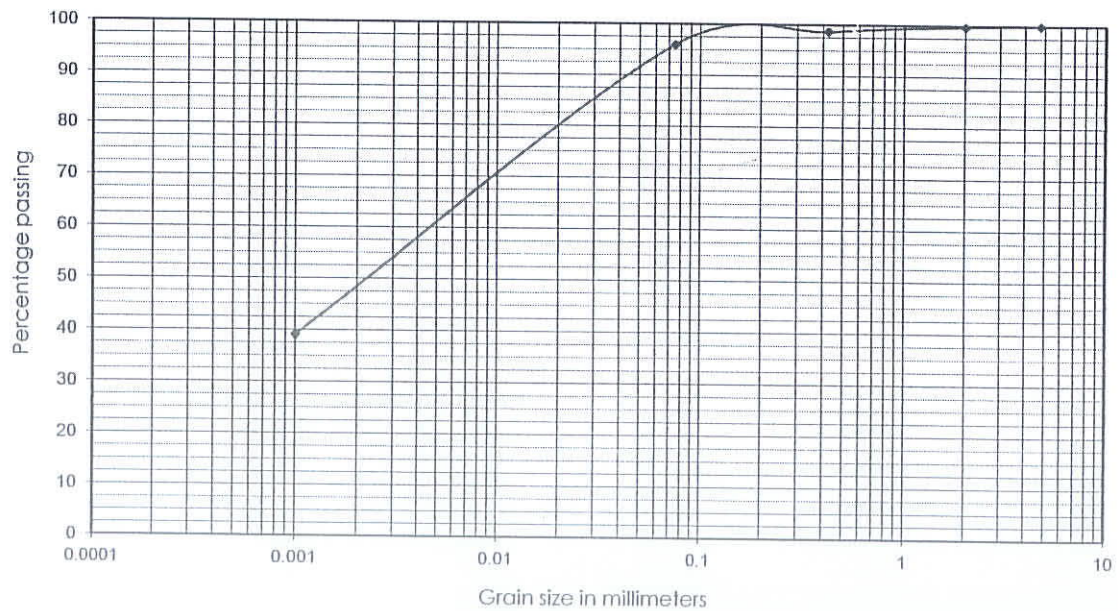
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GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	15.00	CH	0	3	60	37			

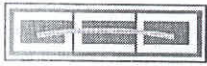


BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	18.00	CH	0	4	57	39			

FIG. 96

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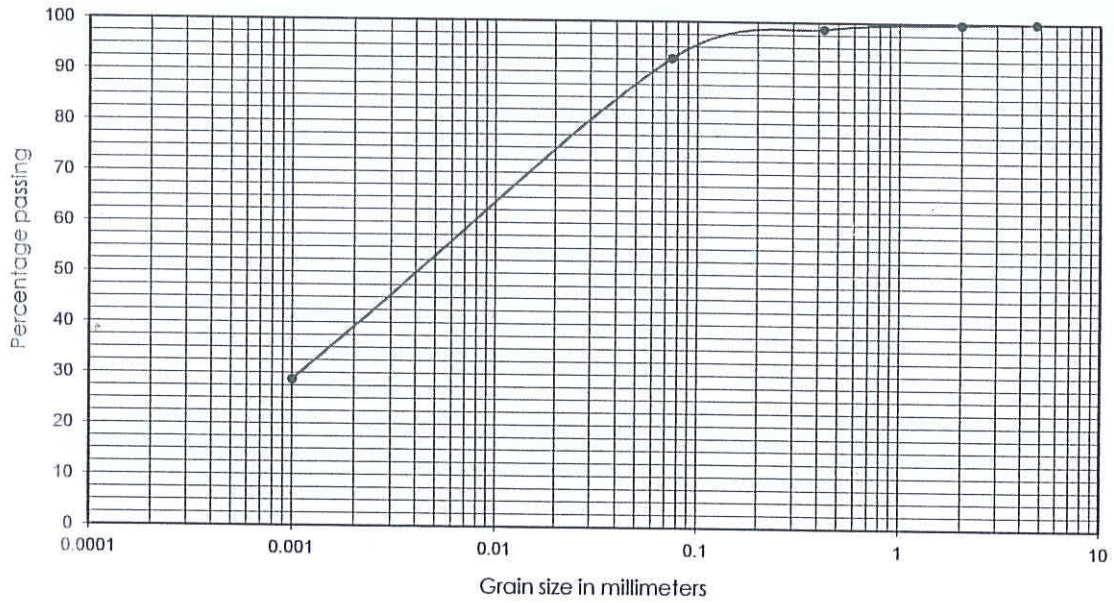
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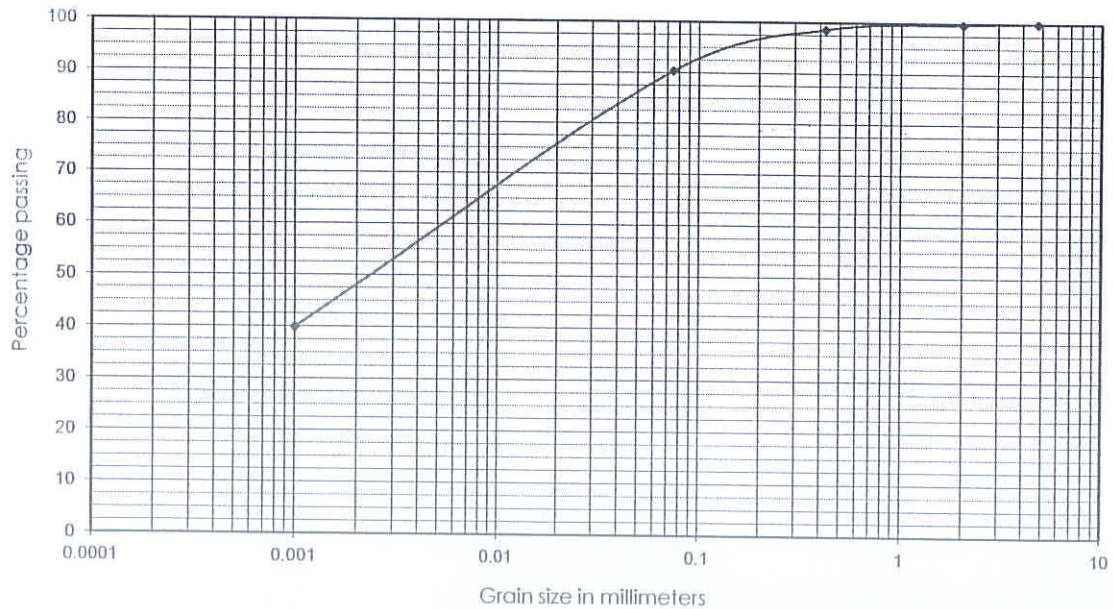
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GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	21.00	CH	0	7	64	29			





BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	25.50	CH	0	10	50	40			

FIG. 97

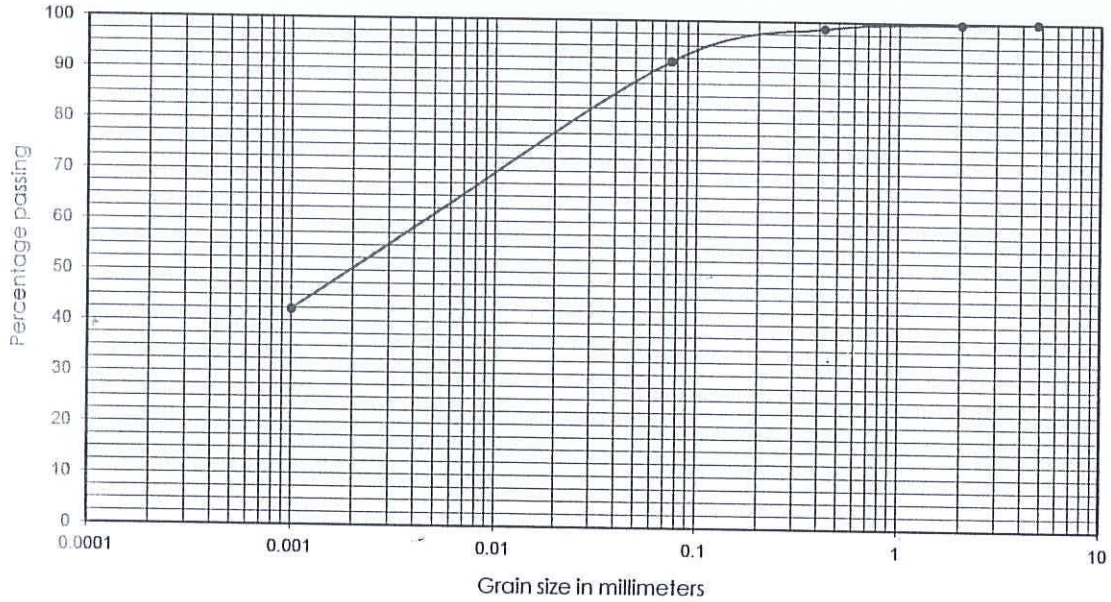
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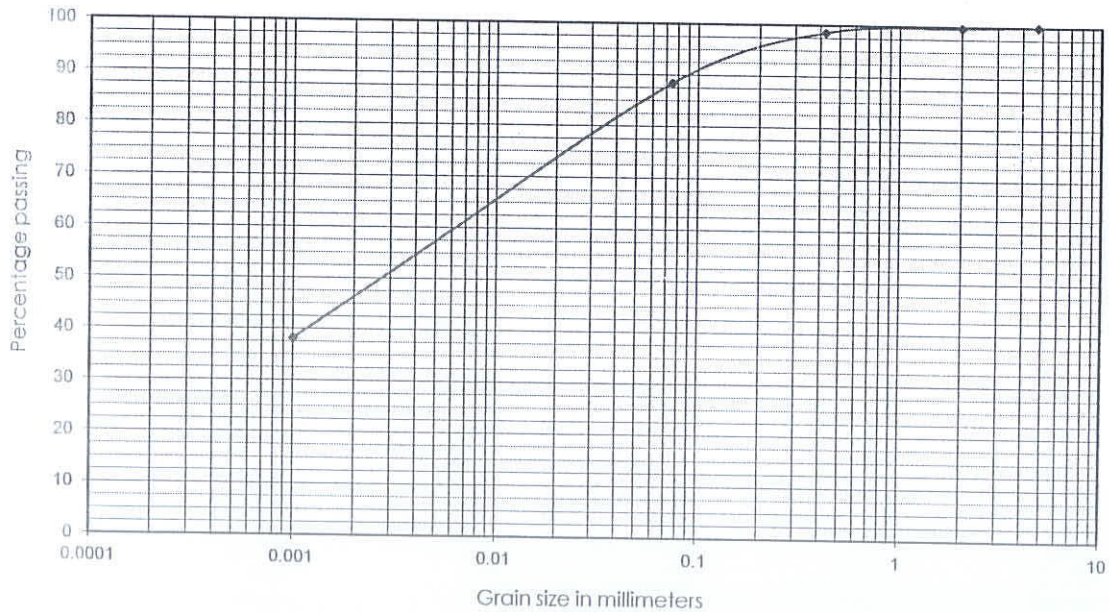
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**GRAINSIZE ANALYSIS TEST**



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	27.00	CH	0	8	50	42			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	30.00	CH	0	12	50	38			

FIG.98

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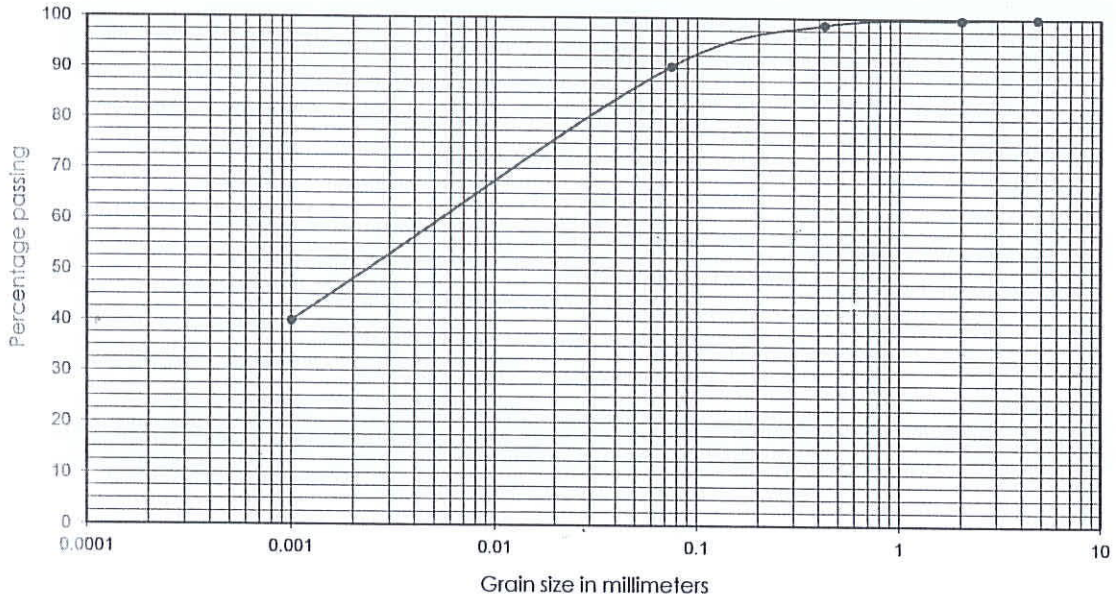
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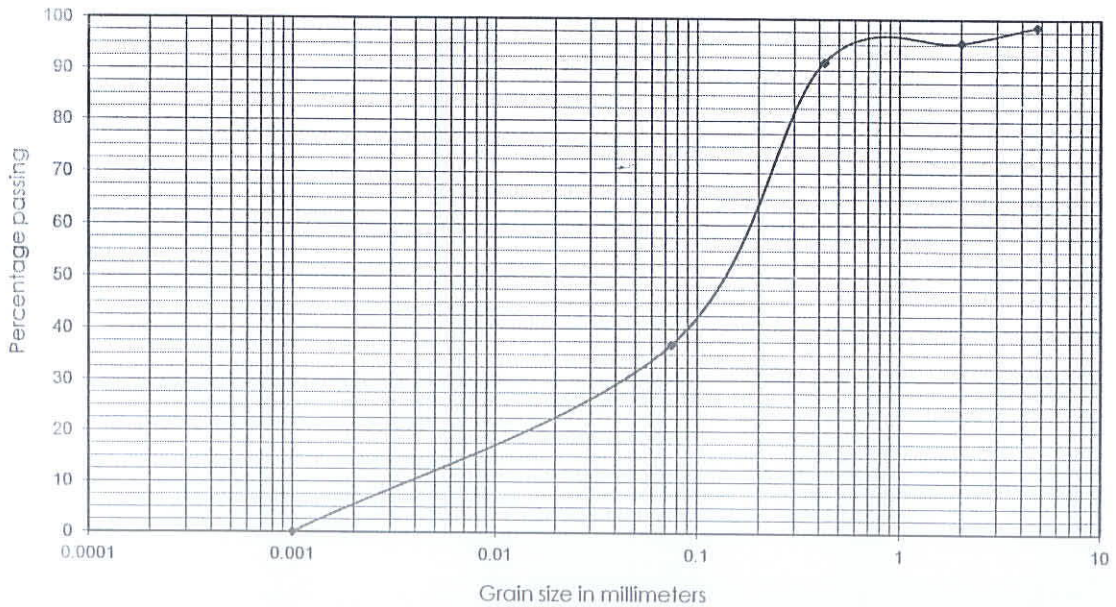
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GRAINSIZE ANALYSIS TEST



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	Cu
BH-05	32.00	CH	0	10	50	40			



BH No.	Depth	IS Class	Gravel(%)	Sand(%)	Silt(%)	Clay(%)	D60	D10	D0
BH-05	36.00	SM	1	62	37	0			

FIG.99

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