Verified RealEstate™

Your trusted partner for buying, selling, and managing property, ensuring hassle-free service with 100% transparency.

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996

Official Property Record

Digitally Verified Record - Powered by Verified RealEstate™



GLOBE GEOTECHNIQUES

GEOTECHNICAL INVESTIGATION REPORT

PROJECT: GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30M HEIGHT) COMMERCIAL(OFFICE USE –248.10SQM) AND RESIDENTIAL BUILDING WITH 26 DWELLING UNITS 18.30 M HEIGHT AT PLOT NOS.A1, A2. A3 AND A4, J.K.AVENUE, RAVI MAIN ROAD, TAMBARAM, CHENNAI -600 100. COMPRISED IN AS PER PATTA S.NOS : 153/ 5, 155/ 1A2, 155/ 1A1C, 155/ 1A1B, 154/ 1A2 AND 155/ 1A1A, OF MEDAVAKKAM VILLAGE, TAMBARAM TAULK, CHENGALPATTU DISTRICK, WITHIN THE LIMITS OF ST.THOMAS MOUNT PANCHAYAT UNION.

CLIENT: Mrs. Anista Gomez and 2 Others.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

Soil Investigation carried out and Report prepared by:

GLOBE GEOTECHNIQUES

CMDA REG.NO.GTE/19/03/012

DTCP REG.NO.GTE/TVLR/01/2019

REPORT NO: GS_DEC22_CTN_013_MEDAVAKKAM

08/12/2022

Globe Geotechniques, No.44/71, Bajanai Koil Street, Choolaimedu, Chennai – 600 094. Mobile: 9445315710 / 6381663653. E-mail: globegeotechniques@gmail.com

CONTENTS

S.NO.	DESCRIPTION	PAGE NO.
1.	INTRODUCTION	1
2.	OBJECTIVE	1
3.	SCOPE OF WORK	2
4.	INVESTIGATION PROGRAM & TECHNIQUES	2 - 4
5.	LABORATARY TESTING PROGRAM	4 - 5
6.	DETAILS OF SUBSURFACE SOIL	6
7.	GROUND WATER	6
8.	SAFE BEARING CAPACITY	6 - 7
9.	FOUNDATION RECOMMENDATIONS	7 - 11
	Appendix – A **BOREHOLE LOG**	A
	Appendix – B **- LABORATARY TEST RESULTS** **-**	B
.	**Appendix – C** **- GENERAL COMMENTS**	C

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-GEDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

INTRODUCTION

This report presents the results of the geotechnical investigations carried out by **GLOBE GEOTECHNIQUES,** for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

This work was authorized by **Mrs. Anista Gomez and 2 Others.** This report contains the field and laboratory test results along with Design computations and recommendations for suitable foundation systems.

Two (02) Standard Penetration Testing bores were drilled at the proposed site up to maximum depth of 03.80 m and 04.50 m at Borehole locations BH-01 and BH-02 respectively below existing ground level as per the request of the client.

The investigation consists of drilling Two (02) boreholes, soil sampling, field and laboratory testing and preparation of a Geotechnical Report for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

OBJECTIVE

The objective of soil investigation is to ascertain the nature and characteristics of sub-soil below the ground level at the site and to establish relevant properties for determination of safe bearing capacity of soil.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

SCOPE OF WORK

The scope of this investigation is to: Mobilization of equipment to the site and demobilization of the same on completion of field work. Determine the soil profile at the site by conducting Standard Penetration tests at various depths, with ground water observation.

i) Collection of disturbed samples and undisturbed samples wherever possible.

ii) Laboratory tests for determination of Index and Engineering Properties of soil.

Recommend a suitable foundation system and safe bearing pressure at the founding levels for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

To achieve the above, Two (02) bores were drilled at the proposed site up to maximum depth of 03.80 m and 04.50 m at Borehole locations BH-01 and BH-02 respectively. The borehole location was selected by our geotechnical engineer in-charge. Soil samples were collected for visual identification, classification and laboratory testing.

The Borehole log is given in Appendix ~A~ and the laboratory test results is presented in Appendix ~B~.

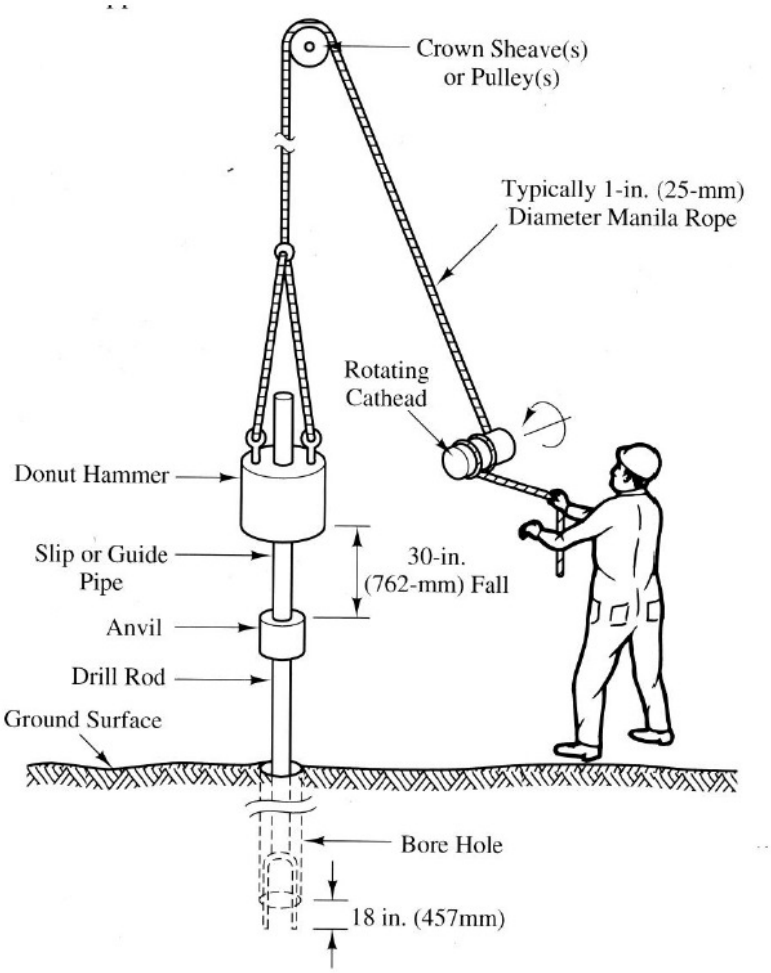
INVESTIGATION PROGRAM & TECHNIQUES

After the visual inspection of the site, the subsurface investigation was started on 30th November 2022 and completed on the same day of 30th November 2022.

Two (02) bores were drilled at the proposed site up to maximum depth of 03.80 m and 04.50 m at Borehole locations BH-01 and BH-02 respectively

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

selected by the geotechnical engineer in-charge. Rotary drilling was performed using water as drilling fluid in the sub soil with casing pipe to stabilize the boreholes up to the required depth. Field testing and sampling were conducted in accordance with IS: 2131-1981.



Standard penetration tests were conducted at the borehole locations, in accordance with IS: 2131. The tests were conducted at every change of strata up to the depth of termination of the borehole as directed by the engineer-in-charge. In this test, a standard split spoon of length about 460 mm and external/internal diameter of 51/35 mm initially penetrates the soil for 15cm to bypass the expected accumulated sludge at the bottom of the hole by means of a **63.5 kg (140 lb) hammer** falling freely along a guide from a height of 760 mm.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

The total number of blows (N) required, to advance the spoon into the bore, for another two successive 15cm (a total of 30 cm) is recorded as a measure of the soil relative density or consistency as given in Table # 1.0. The fieldwork was carried out under the close supervision of our engineer in accordance with Indian Standard mentioned earlier.

LABORATORY TESTING PROGRAM

All the extracted soil samples were brought to the Geotechnical & Materials Testing Laboratory of GLOBE GEOTECHNIQUES, for further examination in accordance with IS: 1498-1970. These samples were used for visual and physical identification and for conducting laboratory classification tests as per I.S.1498-1970.

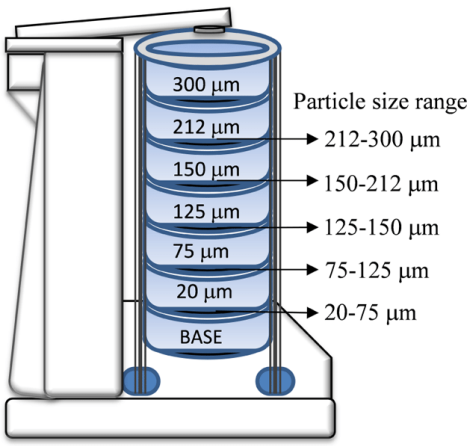
1. Moisture Content
2. Liquid limit (IS: 2720 Part V – 1985)
3. Plastic Limit and Plasticity Index (IS: 2720 Part VI – 1972)
4. Sieve Analysis (IS: 2720 Part IV – 1985)

The laboratory test results are given in Appendix "B".

Coarse Grained Samples:

Grain size Analysis Tests:

On the coarse-grained samples, grain size distribution tests were conducted as per I.S.2720 (Part 4)-1985, to know the gradation characteristics and to classify them. These results are presented in Tables.

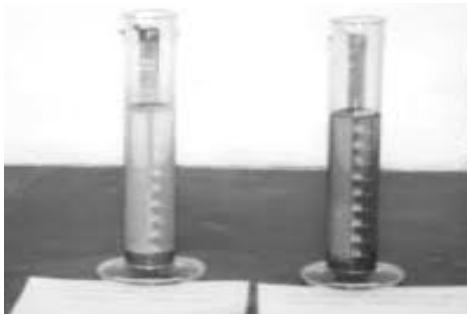


G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

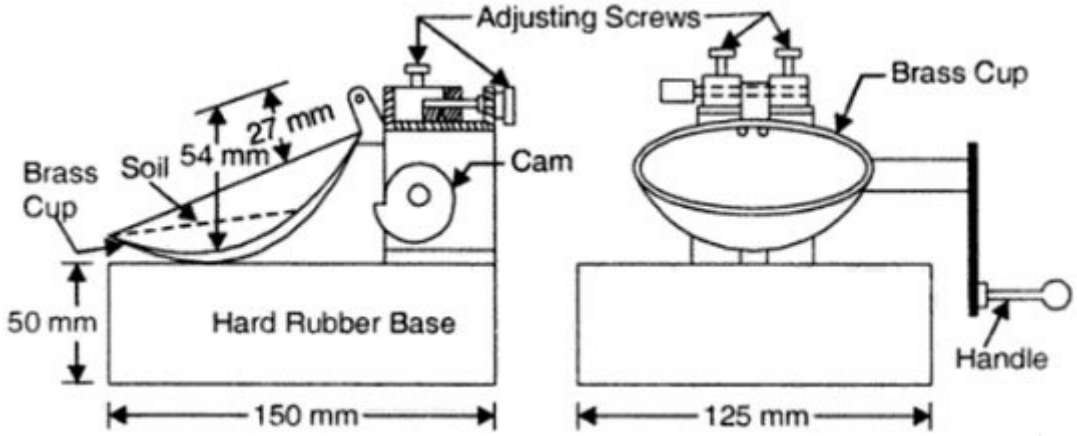
Fine Grained Samples:

Index Property – Free Swell Tests:

Atterberg's Limits were carried out on fine grained soil samples to evaluate the limits of different consistency states. Generally Liquid limits, Plastic limits and Shrinkage Limits tests were conducted as per I.S.2720 (Part-5)-1985 and I.S.2720 (Part 6)-1972. On such type of strata encountered at the investigation locations, such tests were conducted and the test results are presented in tables.

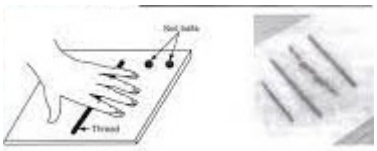












G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

SUBSURFACE SOIL DESCRIPTION

Based on the bore-hole information, the existing sub surface soil profile at the captioned site is illustrated below.

Borehole I	
Layers	**Description of Soil**
00.00 m - 01.00 m	Filled Up / Made Up Soil
01.00 m – 02.80 m	Brownish Sandy Clay
02.80 m – 03.80 m	Soft Weathered / Disintegrated Rock
Below 03.80 m	Soft Rock
Drilling stopped at 03.80 m below EGL	

Borehole II	
Layers	**Description of Soil**
00.00 m - 01.30 m	Filled Up / Made Up Soil
01.30 m – 02.90 m	Brownish Sandy Clay
02.90 m – 04.50 m	Soft Weathered / Disintegrated Rock
Below 04.50 m	Soft Rock
Drilling stopped at 04.50 m below EGL	

GROUND WATER

GROUND WATER TABLE	
Borehole Location	**Depth of Ground Water Table**
Borehole I-II	2.50 m below existing ground level

SAFE BEARING CAPACITY:

IS CODE (IS: 6403-1981) recommends a bearing capacity equation to take into account, the shape of the footing, inclination of loading, depth of embedment and effect of water table.

For General shear failure:

$q_{nf} = cN_c.s_c.d_c.i_c + \sigma (N_q-1)\, s_q.d_q.i_q + 0.5\, B.Y.N_Y.s_Y.d_Y.i_Y W'$

For Local shear failure:

$q_{nf} = 2/3\, cN_c'.s_c.d_c.i_c + \sigma (N_q'-1)s_q.d_q.i_q + 0.5\, B.Y.N_Y'.s_Y.d_Y.i_Y W'$

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-SGDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

SHAPE FACTORS (IS: 6403-1981)

Shape of base	Shape factors		
	s_c	s_q	s_Y
1.Continuous strip	1.0	1.0	1.0
2.Rectangle	(1+0.2B/L)	(1+0.2B/L)	(1-0.4B/L)
3.Square	1.3	1.2	0.8
4. Circle	1.3	1.2	0.6

PILE LOAD CAPACITY:

STATIC FORMULA:

PILE LOAD CAPACITY = POINT BEARING RESISTANCE + END BEARING RESISTANCE.

Rock Quality Designation: RQD is defined as the percentage of intact drill core pieces longer than 10cm recovered during a single core run. The general equation is expressed as shown in below.

RQD: (Σ Rock Pieces ≥10 cm / Core run total Length) x100 %

RQD (%)	Geotechnical Quality
<25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CODA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

FOUNDATION RECOMMENDATION:

The foundation system design is an interface between super structure and the sub soil bearing strata characteristics. A sound foundation system should be safe against bearing strata shear response under the super

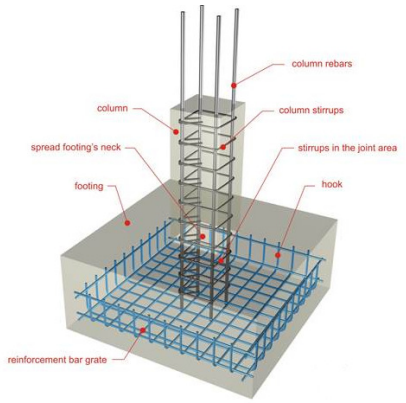
structure load intensity. Similarly, the stability of the foundation system is governed by the bearing strata deformation response under the super structure load intensity.

In addition, as a combined system of super structure and foundation, the overall stability is also governed by the super structure arrangement. Considering the above aspects of foundation design, the suitable type of foundation system with respect to the sub soil conditions encountered at the borehole locations is presented in the subsequent sections.

Based on the borehole information in addition to the nature of the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai, the following foundation recommendation shall be adopted.

OPTION I: ISOLATED FOUNDATION / COMBINED FOOTINGS:

In view of the observed subsoil strata conditions the proposed structure can be supported on **Isolated/Combined footings** at a depth of **3.00 m** below existing ground level. Safe bearing pressure of **30 t/m^2** or **3.00 kg/cm^2** (**300 kPa**) can be adopted for the design of foundation.



G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

OPTION II: PILE FOUNDATION:

Bored cast in–situ pile (End bearing cum friction) with Socketing shall be adopted by terminating pile length at 05.00 m from existing ground level.

Diameter of Pile (mm)	Pile Length (m)	Recommended Safe Load Carrying Capacity of Pile (Skin+End), Tonnes	Safe Allowable Pull out Capacity of Piles, Tonnes	Recommended Lateral Load Capacity for 5 mm Deflection, Tonnes	Depth of fixity from borehole level (m)
450	5	40	17.12	3.60	6.79
500	5	50	22.14	4.50	7.43
600	5	70	23.36	6.30	8.68

- *Actual pile capacities* shall be verified by pile load tests.

- **Socketing length shall be taken as 2.5 times Diameter of the pile and Cast-in-situ method & DMC (direct mud circulation method) using tripod rig shall be suggested.**

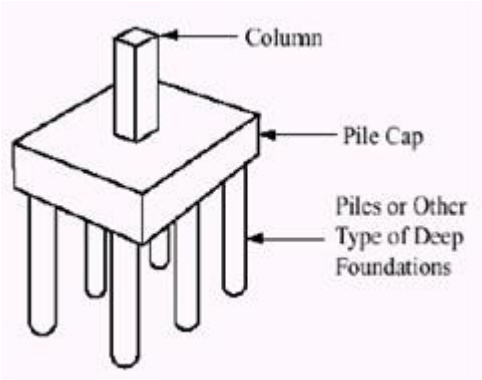
- During rock socketing process, heavy chiselling of high torque drilling may produce vibrations. These vibrations may cause destabilization of soft rock/soil strata over laying the rock layer. Thus the pile will lose friction component from these layers. Hence greater care should be taken to reduce the vibrations.

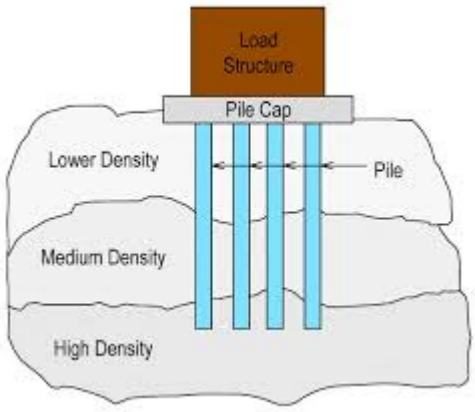
- In order to remove fine particles produced during socketing process and other cuttings, the borehole should be thoroughly washed with fresh bentonite slurry just before pouring concrete.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CEDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

- *Two/ Three Piles per column shall be designed in order to have lateral stability.*

- Since, the behavior of the pile not only depends upon the soil parameters (theoretical load carrying capacity estimates) but also on the execution skill and care, it is mandatory to construct prototype pile load tests as per the guide lines laid down in IS: 2911-Part IV to confirm the theoretical estimates, before proceeding with the execution work.





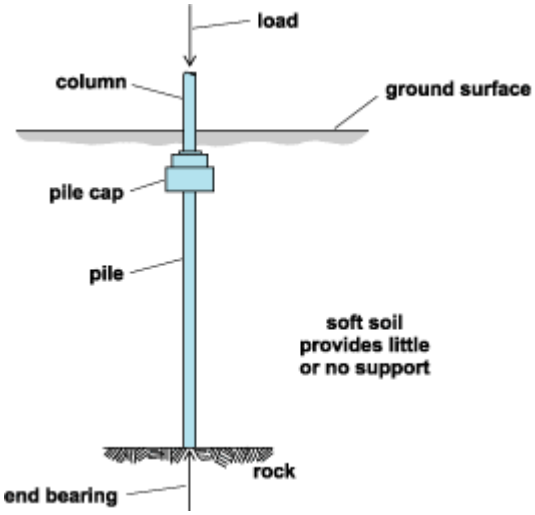
Design and construction of bored cast in situ piles are done in accordance with IS 2911 (part-1/Sec-2) – 2010. The work is basically making a borehole of designed diameter at the designated locations to the required depth, after providing temporary or permanent casing and stabilizing with bentonite slurry; and filling the borehole with concrete after placing reinforcement cage.

The boreholes are drilled using rotary or percussion type drilling rigs, using direct mud circulation (DMC) or reverse mud circulation (RMC) methods. Drilling can also be done using rope operated or hydraulically operated grabbing tools. Concreting is usually done using tremie pipes.

Direct mud circulation method is the less expensive method for doing the boring activity. In this method bentonite slurry is constantly circulated into the

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-C/DA&GTE/TVLR/01/2019-DTC
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

bore hole during the boring activity through the bailer pipes, and overflow is collected and redirected to the bentonite slurry tank. The density of bentonite slurry should be around 1.12. Bentonite has a property of becoming a jelly like substance once left undisturbed for a long time. This jelly acts as plastering on the walls of the bore holes, and thereby preventing the boreholes from caving. Direct mud circulation method is commonly used while boring with bailer and chisel, and reverse mud circulation is adopted for boring using auger. In reverse mud circulation method, the bentonite is directed into the borehole directly, and the return is collected through the drill pipe.



G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

APPENDIX A

BOREHOLE LOG

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CDA& GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

Client: Mrs. Anista Gomez and 2 Others.

Soil Investigation carried out and Report prepared by: GLOBE GEOTECHNIQUES

Project : Geotechnical investigation for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

Location: BH-01

Started On : 30/11/2022; Ended On : 30/11/2022 G.W.T: 2.50 m below existing ground level Final Depth: 03.80 m

R.L of Layer (m)	G.W.T. (m)	Soil Profile	Engineering Description of Soil	SPT - Details: Depth of SPT below E.G.L (m)	SPT - Details: 0-15 cm	SPT - Details: 15-30 cm	SPT - Details: 30-45 cm	SPT - Details: N-Value	Graphical Representation of SPT (10 20 30 40 50 60 70 85 100)	Relative Density/Consistency	Type of Sample
GL			Filled Up / Made Up Soil Filled Up / Made Up Soil Filled Up / Made Up Soil Filled Up / Made Up Soil								
1.00			Filled Up / Made Up Soil	1.00	2	3	4	7		Loose	DS
2.00			Brownish Sandy Clay Brownish Sandy Clay Brownish Sandy Clay Brownish Sandy Clay	2.00	3	4	4	8		Firm	DS
2.50	GWT		Brownish Sandy Clay								
2.80			Brownish Sandy Clay								
3.00			Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock	3.00	13	50 / 21 cm Bal				Very Dense	DS
3.80			Soft Weathered / Disintegrated Rock	3.80	Hammer Rebound					Very Dense	DS
			Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock								

Fig. 2.1 Soil Profile at BH-01 Location

BORE HOLE IS TERMINATED AT THE DEPTH OF 03.80 m FROM EXISTING GROUND LEVEL

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CODA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

Client: Mrs. Anista Gomez and 2 Others.

Soil Investigation carried out and Report prepared by: GLOBE GEOTECHNIQUES

Project : Geotechnical investigation for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

Location: BH-02

Started On : 30/11/2022; Ended On : 30/11/2022 G.W.T: 2.50 m below existing ground level Final Depth: 04.50 m

R.L of Layer (m)	G.W.T. (m)	Soil Profile	Engineering Description of Soil	SPT - Details					Graphical Representation of SPT (10 20 30 40 50 60 70 85 100)	Relative Density/Consistency	Type of Sample
				Depth of SPT below E.G.L (m)	0-15 cm	15-30 cm	30-45 cm	N-Value			
GL			Filled Up / Made Up Soil Filled Up / Made Up Soil Filled Up / Made Up Soil Filled Up / Made Up Soil								
1.30			Filled Up / Made Up Soil								
2.00	▽		Brownish Sandy Clay Brownish Sandy Clay Brownish Sandy Clay	2.00	3	4	5	9	o	Stiff	DS
2.50	GWT		Brownish Sandy Clay Brownish Sandy Clay								
2.90			Brownish Sandy Clay								
3.00			Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock Soft Weathered / Disintegrated Rock	3.00	11	50 / 19 cm Bal				Very Dense	DS
4.50			Soft Weathered / Disintegrated Rock	4.50	Hammer Rebound				o	Very Dense	DS
			Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock Soft Rock								

Fig. 2.2 Soil Profile at BH-02 Location

BORE HOLE IS TERMINATED AT THE DEPTH OF 04.50 m FROM EXISTING GROUND LEVEL

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/20[illegible]2-C &DA& GTE/TVLR/0 1/2019-D TCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

APPENDIX B

LABORATORY TEST RESULTS

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

TABLE – 1
Correlations of SPT N values with Common properties of soils

A) Granular Soil

S.NO.	Standard Penetration No., SPT N	Description	Relative Density, Dr %	Approx. Angle of Internal Friction, Φ°	Approx. Rang of Most. Unit Wt.,ע kN/m3
1	< 4	Very Loose	< 20	< 29	11 to 16
2	04 to 10	Loose	20 to 40	29 to 30	14 to 18
3	10 to 30	Medium	40 to 60	30 to 36	17 to 20
4	30 to 50	Dense	60 to 80	36 to 41	17 to 22
5	> 50	Very Dense	> 80	> 41	20 to 29

B) Cohesive Soil

S.NO.	Standard Penetration No., SPT N	Description	Unconfined Compressive Strength(q_u), kPa	Cohesive Stength (c), kPa	Approx. Rang of Most. Unit Wt.,ע kN/m3
1	< 02	Very Soft	0 to 25	0 to 12.50	14.40 to 16.00
2	02 to 04	Soft	25 to 50	12.50 to 25	16.00 to 17.74
3	04 to 08	Firm	50 to 100	25 to 50	17.60 to 19.20
4	08 to 15	Stiff	100 to 200	50 to 100	19.20 to 20.80
5	15 to 30	Very Stiff	200 to 400	100 to 200	20.80 to 22.40
6	> 30	Hard	> 400	> 200	> 20.00

Note: These values are most appropriate values in general. However, the soil properties vary between sites to site and hence it shall be used only for guidance

ABBREVIATION :

W_N	Natural Moisture content (%)
W_L	Liquid limit (%)
W_P	Plasticity Limit (%)
I_P	Plasticity Index (%)
F.S.I.	Free Swell Index (%)
IS	Indian Standard Classification
CL	Low Compressibility Clay of with WL < 35%
CI	Intermediate Compressibility Clay of with 35%<WL<50%
CH	High Compressibility Clay of with >50%

Table of Laboratory Test Results

Client: Mrs. Anista Gomez and 2 Others.

Soil Investigation carried out and Report prepared by: GLOBE GEOTECHNIQUES

Project : Geotechnical investigation for the proposed construction of Stilt+05 Floors RCC Framed Structure at Plot No: A1 to A4, S. No: 154/1A2, 155/1C1B, 154/2B3A2, 155/1C1A1 & 155/1C1A2, JK avenue, Medavakkam, Chennai.

Bore Hole No	Depth (m)		Type of Soil	Grain Size Analysis (Particle Retained in IS Sieve) %					Atterberg Limits			IS Classification	Natural Moisture Content %	Remarks
	From	To		4.75 mm	2.00 mm	0.425 mm	0.075 mm	Fines	LL	PL	PI			
BH 1	0.00	1.00	Filled Up / Made Up Soil	-	-	-	-	-	-	-	-	-	-	
	1.00	2.80	Sandy Clay	0	0.52	11.14	23.36	64.98	41.0	19.0	22.0	SP	12.25	
	2.80	3.80	SDR	TCR=0%		RQD=0%		Rock Quality = Highly Weathered / Disintegrated Rock						
	Below 3.80		SR	-	-	-	-	-	-	-	-	-	-	
BH 2	0.00	1.30	Filled Up / Made Up Soil	-	-	-	-	-	-	-	-	-	-	
	1.30	2.90	Sandy Clay	0.57	1.58	10.41	24.58	62.86	41.0	19.0	22.0	SP	12.25	
	2.90	4.50	SDR	TCR=0%		RQD=0%		Rock Quality = Highly Weathered / Disintegrated Rock						
	Below 4.50		SR	-	-	-	-	-	-	-	-	-	-	

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

APPENDIX C

GENERAL COMMENTS

GENERAL INSTRUCTIONS (FOR SHALLOW FOUNDATIONS)

STRUCTURAL FILL

It shall be made of compacted coarse gravel material and placed in layers of 50cm thickness with a minimum compaction of 95% of maximum dry density.

FOUNDATION CONSIDERATIONS

A PCC (Plain Cement Concrete) layer of 10cm thickness is recommended below the foundations.

Any over excavation in the foundation trenches should be re-filled by plain concrete and any disturbed and loose materials found in the foundation trenches should be removed before placement of P.C.C.

EXCAVATION

Excavation through the overburden soil can be carried out by conventional equipment such as dozers and Poclain Excavators.

BACKFILLING AND COMPACTION

Backfilling materials shall be granular with durable particles free of deleterious matter, meeting the gradation requirement. It shall not contain stones larger than 80 mm; more than 35% fines passing # 200 sieves and is free of any deleterious foreign matter. Backfilling materials shall be placed in horizontal layers not exceeding 25 cm thickness and each layer shall be compacted to atleast 95% of the maximum dry density. If there is any over excavations in the foundation trenches, which should be refilled with either structural fill or lean concrete and all the loose and disturbed materials, should be cleared from the foundation trenches.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/20[illegible]2-C & DA& GTE/TVLR/0 1/2019-D TCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

GENERAL INSTRUCTIONS (FOR DEEP FOUNDATIONS)

Pile foundations shall be designed in such a way that the load from the structure can be transmitted to the sub-surface with adequate factor of safety against shear failure of sub-surface and without causing such settlement (differential or total), which may result in structural damage and/or functional

distress under permanent/transient loading. The pile shaft should have adequate structural capacity to withstand all loads (vertical, axial or otherwise) and moments which are to be transmitted to the subsoil and shall be designed according to IS 456.

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CMDA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com

MATERIALS AND STRESSES

CEMENT:

The cement used shall be any of the following:

a) 33 Grade ordinary Portland cement conforming to IS 269,

b) 43 Grade ordinary Portland cement conforming to IS 8112,

c) 53 Grade ordinary Portland cement conforming to IS 12269,

d) Rapid hardening Portland cement conforming to IS 8041,

e) Portland slag cement conforming to IS 455,

f) Portland pozzolana cement (fly ash based) conforming to IS 1489 (Part 1),

g) Portland pozzolana cement (calcined clay based) conforming to IS 1489 (Part 2),

h) Hydrophobic cement conforming to IS 8043,

i) Low beat Portland cement conforming to IS 12600,and

j) Sulphate resisting Portland cement conforming to IS 12330.

STEEL REINFORCEMENT STEEL SHALL BE ANY OF THE FOLLOWING:

a) Mild steel and medium tensile steel bars conforming to IS 432 (Part 1), b) High strength deformed steel bars conforming to IS 1786, and c) Structural steel conforming to IS 2062.

CONCRETE:

Consistency of concrete to be used for driven cast in-situ piles shall be consistent with the method of installation of piles. Concrete shall be so designed or chosen as to have a homogeneous mix having a slump/workability consistent with the method of concreting under the given conditions of pile installation.The average compressive stress under working load should not exceed 25 percent of the specified works cube strength at 28 days calculated on the total cross-sectional area of the pile. Where the casing of the pile is

permanent, of adequate thickness and of suitable shape, the allowable compressive stress may be increased.

For the concrete, water and aggregates specifications laid down in IS 456 shall be followed in general. The slump should be 150 to 180 mm at the time of pouring. The minimum grade of concrete to be used for piling shall be M 25. For sub aqueous concrete, the requirements specified in IS 456 shall be followed. The minimum cement content shall be 400 kg/m^3. However, with proper mix design and use of proper admixtures the cement content may be reduced but in no case the cement content shall be less than 350 kg/m^3.

Piles shall be installed as accurately as possible according to the design and drawings either vertically or to the specified batter. Greater care should be exercised in respect of installation of single piles or piles in two pile groups. As a guide, for vertical piles, an angular deviation of 1.5 percent and for raker piles, a deviation of 4 percent should not be exceeded. Piles should not deviate more than 75 mm or D/6 whichever is less (75 mm or D/10 whichever is more in case of piles having diameter more than 600 mm) from their designed positions at the working level. In the case of single pile under a column the positional deviation should not be more than 50 mm or D/6 whichever is less (100 mm in case of piles having diameter more than 600 mm). Greater tolerance may be prescribed for piles cast over water and for raking piles. For piles to be cut-off at a substantial depth below the working level, the design shall provide for the worst combination of the above tolerances in position and inclination. In case of piles deviating beyond these limits and to such an extent that the resulting eccentricity cannot be taken care of by redesign of the pile cap or pile ties, the piles shall be replaced or supplemented by additional piles.

GENERAL COMMENTS

The recommendations for foundation design and construction are based on the information obtained from borehole drilled at location. When foundation

construction is underway, the recommendations of this report should be checked through field inspection, to validate the information for use during the construction stage. Any variation in underground

Conditions revealed by the borehole should be brought to our attention.

For GLOBE GEOTECHNIQUES

G.MANOJ KUMAR, B.E (CIVIL), M.E (GEO-TECH)
Mobile: 9445315710 / 9994712791.
E-mail: globegeotechniques@gmail.com

G. MANOJ KUMAR M.E.,
Registered Geotechnical Engineer
GTE/19/03/2012-CADA&GTE/TVLR/01/2019-DTCP
GLOBE GEOTECHNIQUES
9445315710 & 6381663653
globegeotechniques@gmail.com



our services doesn't just end there

Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.

Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

Verified RealEstate™

We're honored to be part of your real estate journey

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996
www.verified.realestate