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CLIENT	**M/s. GT PROPERTIES, CHENNAI**
PROJECT	**PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING(STILT+05) AT SURVEY NO:45/2A2, GERUGAMBAKKAM VILLAGE, KUNDRATHUR TALUK, KANCHIPURAM DISTRICT.**
TITLE	**GEOTECHNICAL INVESTIGATION REPORT**

0	**29-01-2022**	**CTRL/ M/s. GT PROPERTIES /118/2021-22**	
REV.	**DATE**	**REPORT NUMBER**	**PREP. BY**

For GT HOUSING PVT. LTD.

Authorised Signatory

For CON-TECH RESEARCH LAB

A. Nivedhitha M.Tech
Geotechnical Engineer

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CHAPTER-1

INTRODUCTION

1.0 Preamble

M/s. GT properties, Chennai proposed to construct a **Residential Building (Stilt+05) at Survey No: 45/2A2, Gerugambakkam Village, Kundrathur Taluk, Kanchipuram District.**

For the purpose of designing the foundations, the responsibility of carrying out suitable soil investigations was entrusted to **M/s. Con-Tech Research Lab, Chennai.**

This report contains the field and laboratory test results along with Design computations and recommendations for suitable foundation systems.

1.1 Scope of Work

- Sinking Two Standard Soil investigation bore holes of 150mm diameter up to a depth of 23.00m below existing ground level as directed by the engineer-in-charge.
- Conducting Standard Penetration Test (SPT) at regular depth intervals.
- Collection of Split Spoon Samples or Disturbed Soil Samples
- Collection of water samples from each bore hole.
- Conducting relevant laboratory test results.

1.2 Structure of the Report

- Contents
- Introduction
- Investigation Methodology & Test Results
- Figures & Tables
- Sub-Surface Stratification
- Foundation Systems
- Recommendations
- Annexure (Design Computations)

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CHAPTER-2

INVESTIGATION METHODOLOGY & TEST RESULTS

2.0 Field Testing:

2.1 Preamble:

Two standard soil investigation boreholes were put. The equipment used and the methodology adopted to carry out the fieldwork is described below.

2.2 Equipment Used and Method of Drilling:

2.2.1 Equipment Used

The equipment used for performing the drilling operations is a Manual Rotary Drill Rig with direct mud circulation technique. The drill mud used was made out of Sodium Bentonite.

2.2.2 Methodology of drilling

In the soil strata, the drilling operations have been carried out using special drill bits with direct mud circulation.

2.3 In-Situ Strength Tests:

2.3.1 Standard Penetration Test:

Standard penetration tests were conducted at the borehole location, 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.

2.4. Collection of Samples:

2.4.1 Disturbed Soil Samples

The SPT-samples collected were used as disturbed soil samples. These samples were used for visual and physical identification and for conducting laboratory classification tests as per I.S.1498-1970.

2.4.2 Ground Water

For conducting suitable chemical tests, the ground water sample was collected from the respective boreholes.

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2.5 Summary of Field Work

The locations of the boreholes are shown in site plan given in Fig.2.0. The soil profiles obtained at each location is shown in Figs.2.1 & 2.2.

2.6 Laboratory Testing:

2.6.1 Coarse Grained Samples:

2.6.1.1 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 2.1 & 2.2.

2.6.2 Fine Grained Samples:

2.6.2.1 Index Property – Free Swell Tests:

Atterberg 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 soil strata were encountered at the investigation locations, such tests were conducted and the test results are presented in Tables 2.1 & 2.2.

2.6.3 Chemical Analysis Tests:

2.6.3.1 Soil Samples:

On representative soil samples, chemical analysis tests were conducted to estimate pH, Chlorides and Sulphates. These results are presented in Table-2.3.

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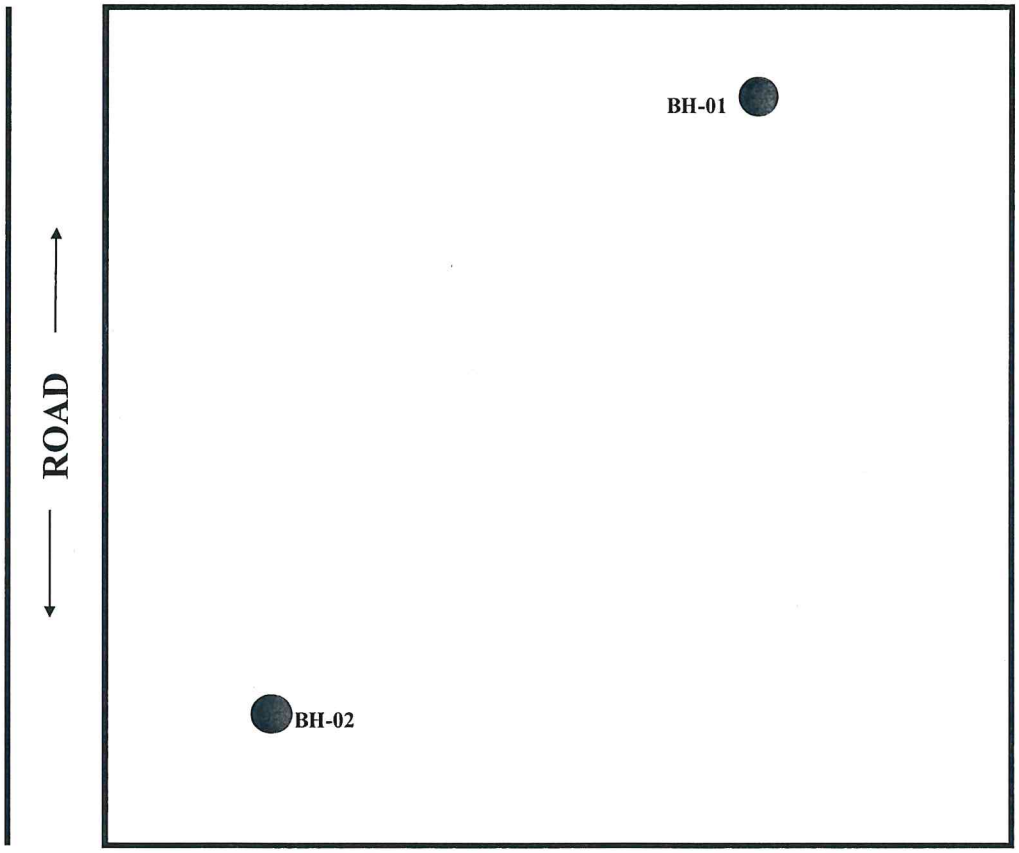


Fig. 2.0: Site Plan Representing the locations of Field Investigation Points

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Location: BH-01

Started On : /01/2022; Ended On : /01/2022 G.W.T: Not met within investigation depths

	G.W.T. (m)	Soil Profile	Engineering Description of Soil	SPT - Details: Depth of SPT below E.G.L (m)	0-15 cm	15-30 cm	30-45 cm	Graphical Representation of SPT: N-Value (0 10 20 30 40 50 60 70 80 90)	Relative Density/Consistency	Type of Sample
			Brownish Stiff Silty Clay	1.00	3	6	7	13	Stiff	SS
1.50										
				2.00	5	8	11	19	M.Dense	SS
				3.00	5	7	9	16	M.Dense	SS
			Brownish Medium Dense Silty Fine Sand	4.50	4	9	10	19	M.Dense	SS
				6.00	6	10	14	24	M.Dense	SS
6.50										
			Brownish Loose Silty Fine Sand	7.50	10	6	2	8	Loose	SS
8.00										
				9.00	5	6	6	12	Stiff	SS
			Blackish Stiff Silty Clay	10.50	5	7	8	15	Stiff	SS
				12.00	4	4	5	9	Stiff	SS
13.00										
				13.50	3	3	5	8	M.Stiff	SS
			Blackish Medium Stiff Silty Clay	15.00	2	2	4	6	M.Stiff	SS
16.00										
			Blackish Stiff Silty Clay	16.50	4	5	7	12	Stiff	SS

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18.00			18.00	3	3	4	7	M.Stiff	SS
		Blackish Medium Stiff Silty Clay							
19.50									
		Blackish Stiff Silty Clay	20.00	4	4	5	9	Stiff	SS
21.00									
		Greenish Very Dense Silty Fine Sand	22.00	12	27	30	57	V.Dense	SS
23.00			23.00	14	29	33	62	V.Dense	SS

Bore Hole Terminated at a depth of 23.00m below the existing ground level

Fig. 2.1 Soil Profile at BH-01 Location

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Project : Proposed Construction of Residential Building (Stilt+05) at Survey No: 45/2A2, Gerugambakkam Village, Kundrathur Taluk, Kanchipuram District.

Location: BH-02

Started On : /01/2022; Ended On : /01/2022 G.W.T: Not met within investigation depths

	G.W.T. (m)	Soil Profile	Engineering Description of Soil	SPT - Details				Graphical Representation of SPT		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	0 10 20 30 40 50 60 70 80 90		
1.50			Brownish Stiff Silty Clay	1.00	3	5	7	12		Stiff	SS
4.00			Brownish Loose Silty Fine Sand	2.00	4	6	8	14		Loose	SS
				3.00	5	7	7	14		Loose	SS
8.00			Brownish Medium Dense Silty Fine Sand	4.50	6	8	9	17		M.Dense	SS
				6.00	5	7	9	16		M.Dense	SS
				7.50	6	11	11	22		M.Dense	SS
10.00			Blackish Very Stiff Silty Clay	9.00	6	8	9	17		V.Stiff	SS
11.50			Blackish Stiff Silty Clay	10.50	5	7	8	15		Stiff	SS
13.00			Blackish Very Stiff Silty Clay	12.00	12	6	10	16		V.Stiff	SS
15.00			Blackish Stiff Silty Clay	13.50	6	8	6	14		Stiff	SS
				15.00	5	5	2	7		M.Stiff	SS
			Blackish Medium Stiff	16.50	2	3	4	7		M.Stiff	SS

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19.50		Silty Clay	18.00	2	3	4	7	M.Stiff	SS
21.00		Blackish Very Stiff Silty Clay	20.00	8	10	11	21	V.Stiff	SS
22.20		Greenish Very Dense Silty Fine Sand	22.00	18	18	33	51	V.Dense	SS

Bore Hole Terminated at a depth of 22.20m below the existing ground level

Fig. 2.2 Soil Profile at BH-02 Location

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Table 2.1: Laboratory Test Result on the Soil Sample Collected from BH-01

Depth of Sample below E.G.L. (m)	SPT of Sample	Type of Sample	Engineering Description of Soil	NMC(%)	Natural Density (g/cc)	Clay					Relative Density/ Consistency	Sieve Analysis						IS-Classification
						LL (%)	PL (%)	PI	I_c	FS		Gravel (%)	Coarse (%)	Medium (%)	Fine (%)	Silt (%)	Clay (%)	
0.00 to 1.50	13	SS	Silty Clay	28	1.7	66	22	44	0.86	50	Stiff	0	0	0	0	20	80	CH
1.50 to 6.50	19	SS	Silty Fine Sand	-	1.6	-	-	-	-	-	M.Dense	0	0	0	77	23	0	SM
6.50 to 8.00	8	SS	Silty Fine Sand	-	1.5	-	-	-	-	-	Loose	0	0	0	75	25	0	SM
8.00 to 13.00	12	SS	Silty Clay	29	1.7	69	24	45	0.89	-	Stiff	0	0	0	0	19	81	CH
13.00 to 16.00	7	SS	Silty Clay	38	1.6	79	21	58	0.71	-	M.Stiff	0	0	0	0	18	82	CH
16.00 to 18.00	12	SS	Silty Clay	30	1.7	68	25	43	0.88	-	Stiff	0	0	0	0	21	79	CH
18.00 to 19.50	7	SS	Silty Clay	36	1.6	78	22	56	0.75	-	M.Stiff	0	0	0	0	19	81	CH
19.50 to 21.00	9	SS	Silty Clay	31	1.7	65	25	40	0.85	-	Stiff	0	0	0	0	20	80	CH
21.00 to 23.00	57	SS	Silty Fine Sand	-	2.0	-	-	-	-	-	V.Dense	0	0	0	85	15	0	SM

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Table 2.2: Laboratory Test Result on the Soil Sample Collected from BH-02

Depth of Sample below E.G.L. (m)	SPT of Sample	Type of Sample	Engineering Description of Soil	NMC(%)	Natural Density (g/cc)	Clay					Relative Density/ Consistency	Sieve Analysis						IS-Classification
						LL (%)	PL (%)	PI	I_c	FS		Gravel (%)	Coarse (%)	Medium (%)	Fine (%)	Silt (%)	Clay (%)	
0.00 to 1.50	12	SS	Silty Clay	30	1.7	70	21	49	0.82	60	Stiff	0	0	0	0	19	81	CH
1.50 to 4.00	14	SS	Silty Fine Sand	-	1.5	-	-	-	-	-	Loose	0	0	0	76	24	0	SM
4.00 to 8.00	18	SS	Silty Fine Sand	-	1.6	-	-	-	-	-	M.Dense	0	0	0	77	23	0	SM
8.00 to 10.00	17	SS	Silty Clay	27	1.8	66	22	44	0.89	-	V.Stiff	0	0	0	0	21	79	CI
10.00 to 11.50	15	SS	Silty Clay	28	1.7	69	24	45	0.91	-	Stiff	0	0	0	0	20	80	CH
11.50 to 13.00	16	SS	Silty Clay	26	1.8	65	25	40	0.98	-	V.Stiff	0	0	0	0	21	79	CI
13.00 to 15.00	14	SS	Silty Clay	29	1.7	68	28	40	0.98	-	Stiff	0	0	0	0	20	80	CH
15.00 to 19.50	7	SS	Silty Clay	38	1.6	79	21	58	0.71	-	M.Stiff	0	0	0	0	19	81	CH
19.50 to 21.00	21	SS	Silty Clay	25	1.9	59	28	31	1.10	-	V.Stiff	0	0	0	0	22	78	CI
21.00 to 22.20	51	SS	Silty Fine Sand	-	2.0	-	-	-	-	-	V.Dense	0	0	0	84	16	0	SM

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Table 2.3: Chemical Analysis Results conducted on Soil Samples collected from BH-01 & BH-02

Location	Depth of Sample below E.G.L. (m)	pH	Chlorides (ppm)	Sulphates (ppm)
BH-01	3.00	6.60	388.45	437.00
BH-02	3.00	6.61	393.65	442.85

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