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SHANMUGHA GEOTECH

No.32/11, Govindaraju Street,
Rangarajapuram Main Road,
(Near Indian Bank), Kodambakkam,
Chennai - 600024
Cell No. 9444042316

Project: (G+3) Residential Building

M/S.K.L.Builders,
NO.17/1, Desigar Street,
Vadapalani Chennai – 6000026.

SHANMUGHA GEOTECH

Report No: SGT/01/2025

REPORT ON GEOTECHNICAL INVESTIGATION

06.01.2025

To

M/S.K.L.Builders,
NO.17/1, Desigar Street,
Vadapalani Chennai – 6000026.

NAME OF WORK: PROPOSED CONSTRUCTION OF (G+3) RESIDENTIAL BUILDING IN VADAPALANI, CHENNAI.

SUB: SUBMISSION OF GEOTECHNICAL INVESTIGATION REPORT

Dear Sir,

We are pleased to hereby transmit as original hard copy and soft copy sent to your address, our final geotechnical investigation report for the above-mentioned project.

If you have any questions, please contact this office.

It has been a pleasure being of service to you on this project. Assuring you of our continued co-operation and we remain.

Thank you,

Yours Truly,

P.KALPANA,M.E.,
GEOTECHNICAL ENGINEER,
Regn No.GTE / 19/03/009
M/s. SHANMUGHA GEOTECH

For Shanmugha Geotech
P.Kalpana M.E.,
Geotechnical Engineer

Er.K.Shanmugam.B.E. (Civil) M.S. (Engg)
Managing Director
M/s.Shanmugha Geotech/SM Associates
Chennai - 600024

GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED CONSTRUCTION OF (G+3) RESIDENTIAL BUILDING IN VADAPALANI, CHENNAI

1. INTRODUCTION

M/s.K.L.Builders, has proposed to construct a (G+3) Residential Building, at No. 17/1, Desigar Street, Vadapalani, Chennai - 600026. A detailed soil investigation was suggested by the client for obtaining the soil profile and recommendation of the most suitable foundation system for the proposed construction of (G+3) Residential Building. Accordingly, the soil exploration in the field was carried out by an SPT engaged by M/s. Shanmugha Geotech, Chennai at the site on 22nd to 24th December 2024 and suggests the most suitable foundation system along with recommendations. This report comprises the details laboratory test results of given soil samples, analysis of field bore-log, and recommendation of the most suitable foundation system.

2. SCOPE OF WORK

A. We are submitting GT-Report of 1 No. of Standard Soil Investigation borehole depths of 12.0m in BH-1 & 28.0m in BH-2.The detail of the Borehole location is mentioned in TABLE 1 below.

Table 1: Details of Borehole Location

Sl.No.	Bore Hole ID.	Location	Terminated Depth (m)
1	BH-1	Vadapalani	12.00
2	BH-2	Vadapalani	28.00

B. Conducting SPT's at regular depth intervals.

C. Conducting relevant laboratory tests.

D. The bore holes were terminated at a depth where the N Value reaches from more than 50 or the hammer gets rebound.

E. Collecting disturbed and Undisturbed Soil Samples.

F. Submitting report with Field observations, laboratory test results along with recommendations for foundations.

3. DETAILS OF STRUCTURES

The Structure is (G+3) Residential Building.

The objective of the proposed GT Investigations is to obtain

a. Specific data regarding the sub-soil stratum at the proposed site and
b. To obtain the foundation design parameters.

4. SITE CONDITION AND STANDARD PENETRATION TEST

The proposed site is located at Vadapalani, Chennai. The total number of borehole location has been decided as '2', as agreed by the client. The nature of field tests includes standard penetration tests, disturbed soil sampling through split spoon sampler, identification of different soil layers, retrieving of rock core samples, location of ground water table, complete logging of the borehole etc,. Laboratory investigation consists of classification tests such as grain size distribution, Atterberg limits, specific gravity and free swell index of soil samples.

The boreholes were advanced from the existing ground level using rotary boring technique supplemented by bentonite mud circulation. Mud circulation was used to stabilize the sides and bottom of the boreholes and then to bring the soil cuts to the surface. Bentonite slurry would also help to minimize the disturbance of the soil at the bottom of the borehole while drilling operation is in progress. In general, rotary boring technique with bentonite mud circulation is found most suitable to make exploratory boreholes of diameter 150 mm (IS 1892: 1979). During boring operation, borehole was always kept full with the drilling mud so as to prevent any disturbance to the soil within the test zone. Standard penetration tests were conducted at every 1.0 m interval up to 3.0 m depth, thereafter 1.5 m interval up to termination depth in BH-1 & BH-2.

These SPT tests were carried out using Winch and Rope device for which the expected energy level is approximately 55% to 60%. The 'N' value resulting from this procedure may be considered as N60. Disturbed soil samples collected through the split spoon sampler were preserved and transported to the soil testing laboratory for detailed identification tests. All field and laboratory tests were conducted as per the Indian Standard Testing procedure. All the field

test results recorded in the bore logs are illustrated. The field 'N' values at different depths and samples collected at these depths are mentioned in the bore logs. Laboratory test results (index and engineering properties) of soil samples collected through split spoon sampler are summarized in Table -1of this report.

5. VARIATIONOF SPT-NVALUEWITHRESPECTTODEPTH

Figure (1) shows the variation of SPT 'N' value of different soil layers with respect to depth in BH-1 & BH 2. The presence of the ground water table was identified at 4.00m depth from the SPT bore at the time of soil investigation work.

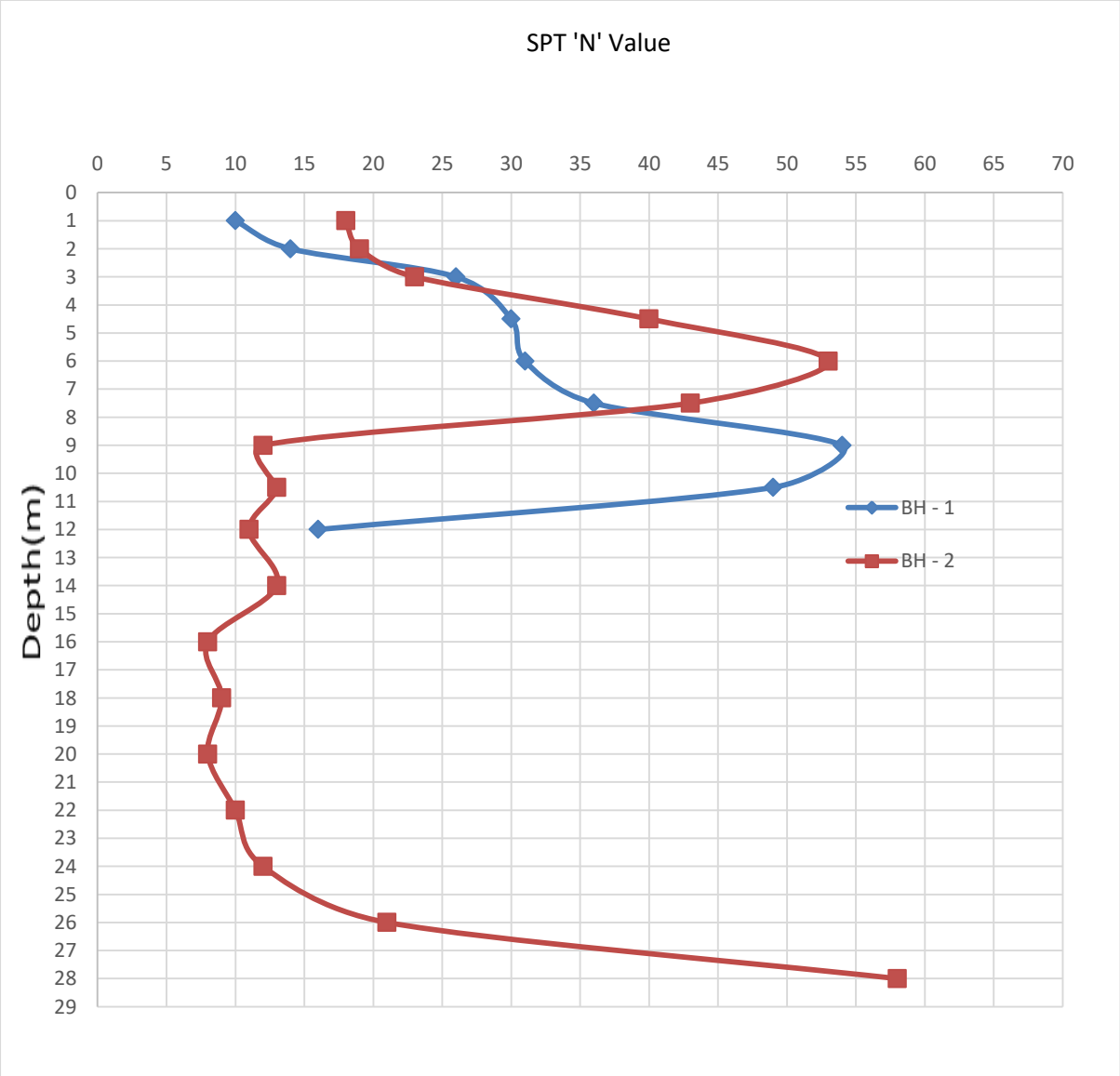


Figure (1) Variation of SPT 'N' value of different soil layers with respect to depth in BH-1 & BH-2

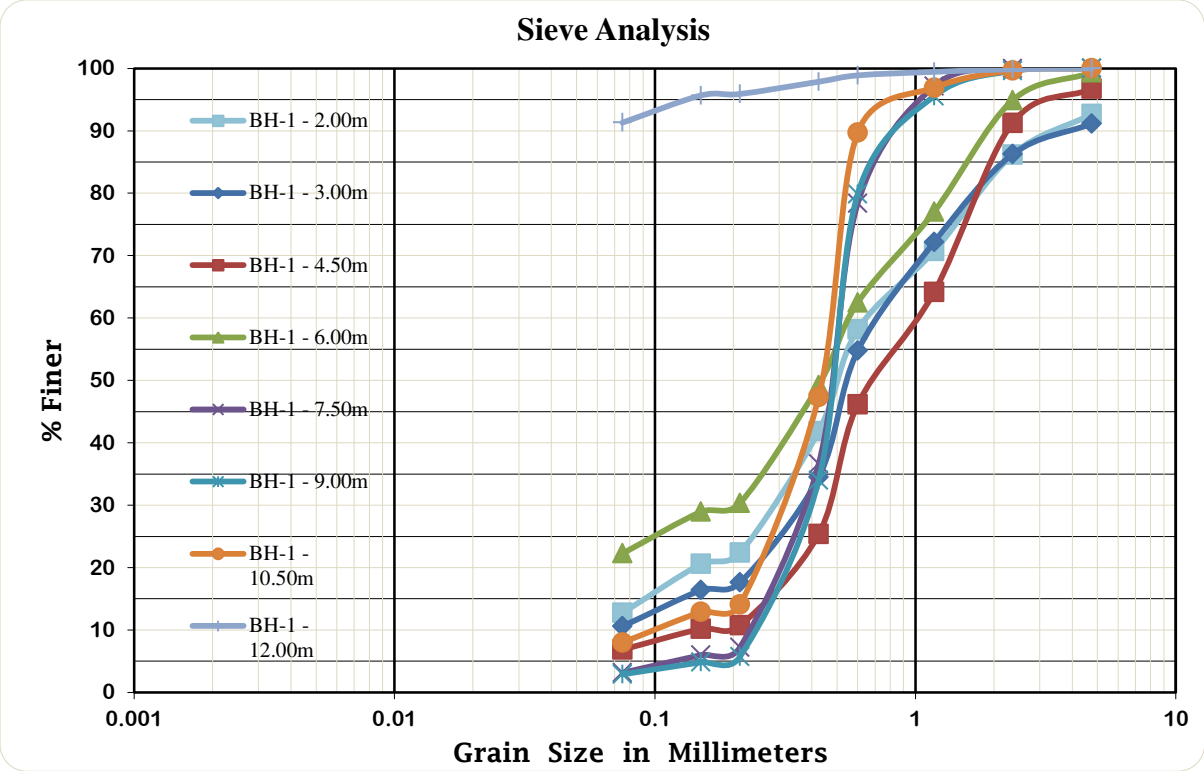


Figure 2 Grain Size Distribution of Soil Samples collected in BH-1 Location

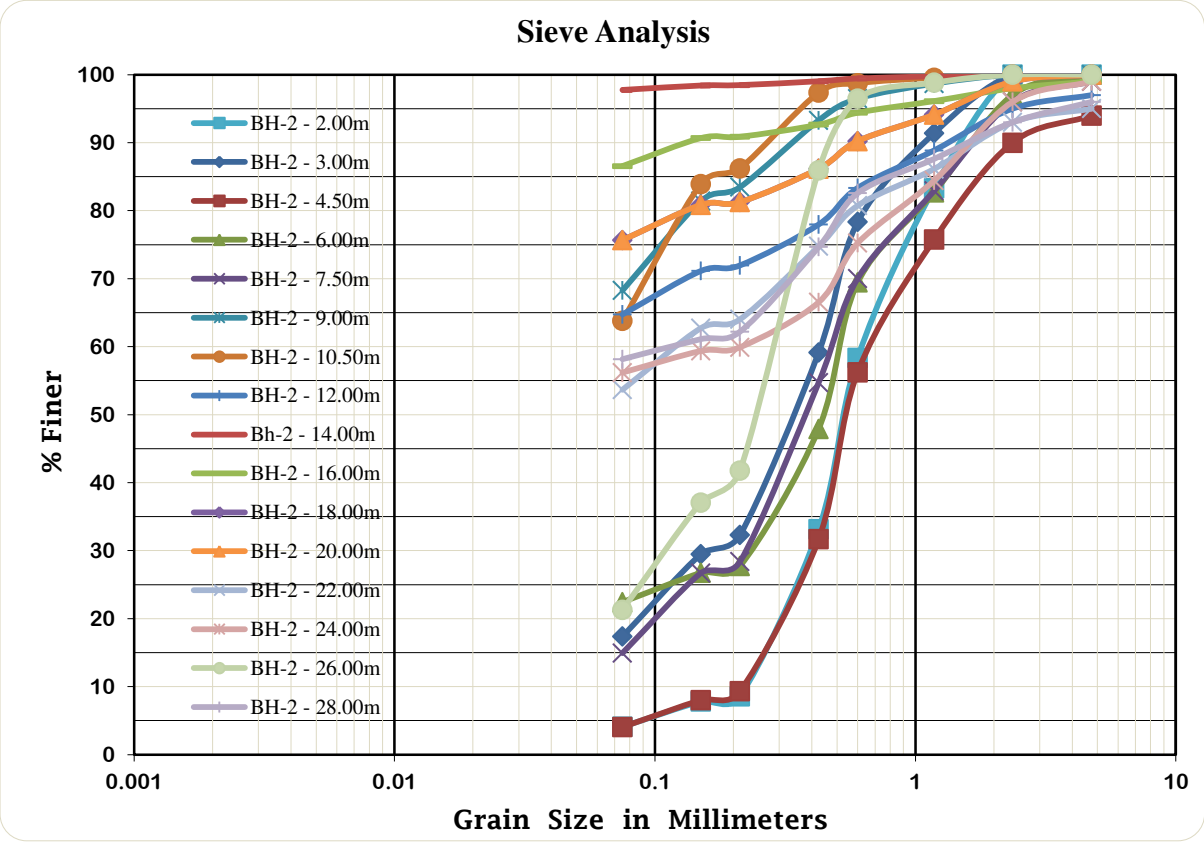


Figure 2 Grain Size Distribution of Soil Samples collected in BH-2 Location

Correlations of SPT N values with Common properties of soils

Granular Soil (Sand)

Standard Penetration No., SPT N Value	Relative Density
< 4	Very loose
4 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
> 50	Very Dense

Cohesive Soil (Clay)

Standard Penetration No., SPT N Value	Relative Density
< 2	Very Soft
2 - 4	Soft
4 - 8	Firm (Medium)
8 - 15	Stiff
15 - 30	Very Stiff
> 30	Hard

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.

Field Test

Laboratory Tests:

All the extracted soil samples were brought to the M/s. Shanmugha Geotech for further examination in accordance with IS: 1498-1970. Selected samples were subjected to the following physical tests.

1. Excavation of bore holes (IS:1892-1979, RA 2002)
2. Standard Penetration Test (IS:2131-1981, RA 2002)
3. Moisture Content (IS 2720 (Part 2):1973, RA 2015)
4. Specific Gravity of Soil (IS 2720(Part 3):1980, RA 2016)
5. Liquid limit (IS 27 20 (Part 5): 1985, RA 2015)
6. Plastic Limit (IS 27 20 (Part 5): 1985, RA 2015)

7. Grain Size Distribution in Soils (IS 2720 (Part 4): 1985, RA 2015)
8. Free Swell Index (IS 2720 (Part 40): 1977, RA 2016)

The specific gravity of soil was found by the pycnometer procedure and results are listed in summary of Laboratory test results. All the strength properties confirmed based on well-known correlations between SPT values and strength parameters. The laboratory test results in graphical format are present in Table-1.

6. SUMMARY OF SOIL PROFILE IN BH 1 & BH 2 LOCATIONS

For BH-1,

Start Depth (m)	End Depth (m)	Profile	Symbol	Relative Density
0.00	1.00	Filling Soil		
1.00	10.50	Brownish Silty Sand /Sand	SM-SP	Medium Dense to Very Dense
10.50	12.00	Greyish Silty Clay	CH	Very Stiff

For BH-2,

Start Depth (m)	End Depth (m)	Profile	Symbol	Relative Density
0.00	1.00	Filling Soil		
1.00	7.50	Brownish Silty Sand /Sand	SM-SP	Medium Dense to Very Dense
7.50	24.00	Greyish Sandy Clayey Silt/Silty Clay	CI-CH	Stiff
24.00	26.00	Greyish Silty Sand	SM	Medium Dense
26.00	28.00	Greyish Sandy Clayey Silt	CI	Hard

7. BEARING CAPACITY AND SETTLEMENT

In order to determine the bearing capacity and settlement of the shallow open foundation system, the geotechnical engineer has assumed the depth of foundation as 2.00m and presences of ground water table was identified at 4.00m depth from the SPT Bore. The Safe

Bearing Capacity is computed using Bureau of Indian Standard IS 6403-1981 equation. The Settlement of foundation is arrived based on IS 8009 (Part I) 1976 (Sec. 9.2.3.2).

The top soil was filling soil at 1.00m depth in BH-1 & BH-2 and below that, a clay and sand layer was found. Hence, it is recommended to replace the soil at 2.50m depth and the foundation is placed at 2.00m depth. The Plain lean Concrete admixture (1:1 ratio) is filled with 2.00m to 2.50m depth. An attempt is made to arrive at the safe bearing capacity and allowable settlement of the foundation soil improved with Plain lean Concrete.

8. ALLOWABLE BEARING CAPACITY

For the determination of Safe Bearing Capacity using IS 6403-1981 equation, the average 'N' value and shear strength parameters below foundation level up to the influence depth of 1B is considered (Varghese 2005) for a depth of foundation at 2.00m and width of foundation as 2.00m. The safe bearing capacity thus computed is shown in Table –1.

TABLE - 1Net Safe Bearing Capacity of the proposed Site with provision of Plain Lean Concrete bed (Depth of Foundation is 2.00m and width of Foundation is 2.00m)

Borehole Location	Design Shear Strength Parameters		Net Safe bearing Capacity (kN/m^2) IS:6403-1981 Equation
	'c' (kN/m^2)	'ϕ' in Degree	
BH-1	0	35.83°	564.80
BH-2	0	37.13°	702.90

9. SETTLEMENT OF SOIL LAYER

One of the important functions of any foundation systems is to satisfy the settlement criteria apart from bearing capacity criteria. The Table – 2 shows the immediate / elastic settlement of foundation computed based on IS 8009 (Part I) 1976 (Sec. 9.2.3.2) for 2.0m width of foundation at 2.00m depth. The total settlement has been computed up to the influence depth of "2B" below the foundation. The allowable settlement as per IS 1904 Table I 1986 is limited to 50 mm. The computed settlement for BH-1 & BH-2 location (least shear strength and 'N' values) is 22.25mm to 32.11mm for 2.0m width for Spread, which is lower than the allowable settlement of 50 mm for Sandy soil.

TABLE 2 Settlement calculations for the proposed Site with provision of Plain Lean Concrete bed (Depth of Foundation is 2.00 m)

Borehole Location	Size of Foundation (m)	SBC (kN/m^2)	Elastic Settlement (mm)	Consolidation Settlement (mm)	Total Settlement (mm)
BH-1	2.0 x 2.0	150	32.11	-	32.11
BH-2	2.0 x 2.0	150	22.25	-	22.25

***Safe Bearing Pressure for an allowable settlement of 50 mm for sand and 75mm for clay**

10. COMPUTATION OF SAFE PILE CARRYING CAPACITY

The pile foundation should be used for the proposed structure. The pile foundation helps to increase the factor of safety of heavy load structures or buildings. The pile foundation guarantees the vertical structures above with safety, security and reliability. The pile and pile cap arrangement in pile foundation help the load distribution to be performed in a uniform manner. Hence, attempts are made to suggest pile foundation for varying pile diameters and length. For computing the load carrying capacity of pile, Indian Standard IS 2911 (Part 1/Sec. 2) 2010 method is used. The diameters of piles are assumed as 450mm, 500mm, and 600mm and the length of the pile is taken as 10.00m. Safe pile carrying capacity computations were made for BH 1 & BH 2 borehole data.

For calculating the skin friction along the pile length of 10.00m, the design “N” values and shear strength parameters for the respective depths were used. The safe end bearing resistance and safe skin frictional resistance are together added for different pile diameter and the total safe load carrying capacity of pile thus computed. The safe uplift capacities of pile for varying diameter are given in Table 3.

TABLE 3 Safe Load carrying capacity of Bored Cast-In-Situ Pile (frictional) of 10.0m Length for varying Diameter

Borehole Location	Pile capacity (frictional) for Bored Cast-In-Situ Piles, (kN) IS 2911 Part-I 2010, Static Formula		
	Based on Shear Strength Parameters ('c' and 'Φ')		
	Diameter of Pile (mm)		
	450	500	600
BH-1	289	556	855
BH 2	206	235	297

TABLE 4 Safe capacities and uplift Capacity of Bored Cast In-Situ Pile (frictional) for a length of 10.0m from the existing ground level (Borehole level)

Diameter of Pile (mm)	Recommended Safe capacity of Bored Cast-In-Situ Piles (frictional), (kN)	Recommended Safe Uplift Capacity (frictional) (kN) IS 2911 (Part 1/Sec. 2) 2010
450	150	117
500	200	134
600	250	170

Note:

The above details are provided based on the soil exploration conducted over the site. Two boreholes has been requested by the Client and the N Value was reaches more than 50 at the termination depth of 12.0m in BH – 1 & 28.0m in BH-2.

11. RECOMMENDATIONS

The following recommendations are suggested for the proposed construction of (G+3) Residential Building at No.17/1, Desigar Nagar, Vadapalani, Chennai – 600026.

1. It is recommended to provide SHALLOW OPEN FOUNDATION
2. It is recommended to excavate 2.50m depth and provide 0.50m thick Plain Lean Concrete bed. The shallow foundation may be placed over the 0.50m thick Plain Lean Concrete.
3. The depth of foundation is 2.00m from the existing ground level over the Plain Lean Concrete at Site (0.50m thickness).
4. The recommended safe bearing capacity of the foundation lay over the 0.50m thick compacted quarry sand - gravel bed is 150kN/m^2 for 2.0m wide Spread/Isolated footing. The permissible settlement for individual footing is 50 mm.
5. The computed settlement of soil for 2.0m x 2.0m foundation with 150kN/m^2 at 2.00m depth with Plain Lean Concrete is 22.27mm to 32.11mm. The computed settlement values are lower than the permissible settlement values of 50 mm for sand and 75mm for clay as per Table I of IS 1904.
6. It is recommended to provide suitable supporting system.
7. All recommendations and design refer to only Indian Standards only.
8. This report is for approval purpose only.
9. Site-specific soil properties may vary depending on the location and environmental conditions. In case of any variations in the soil profile, the above SBC values need to be validated with further investigation.
10. The suggestions have been provided in this report based on the factual Condition of the site. However, the structural engineer may decide on the foundation design based on the above report.
11. Limitation for soils as per code IS: 1904-1988 (RA 1995) Table-1, the Permissible limits for clay and sand soil should be 75mm and 50mm.
12. It is mandatory to ensure the theoretical SBC by conducting a Plate Load

Test on the proposed foundation level. Kindly ensure the SBC by adopting proper test procedures as per IS 9214

13. Grade beams shall be adopted in order to minimize the differential settlements.
14. Compaction should be done properly for the Plain Lean Concrete.
15. Ground improvement needs to provide for a minimum of 3 times the breadth of the footing and corresponding 0.50m depth.
16. Ensure the ground improved soil beneath the foundation for a compaction percentage of more than 95% as per MORTH specification (Rev-5).
17. The TDS and chemical content of ground water may be checked and ensured that they are not exceeding the permissible limits prior to the use of same for construction activities.

The recommended type of pile foundation is "Bored Cast-In-Situ Pile (frictional)"

1. The recommended safe vertical and uplift pile carrying capacity (frictional) of the 10.0m length of 'bored cast in-situ pile' for a diameter is shown in Table 4. The required number of piles may be varied with respect to the varying column loads.
2. The bored cast in-situ pile (frictional) shall be terminated at 10.0m in Greyish Silty Clay Stratum.
3. With regard to execution of bored cast-in-situ pile (frictional), procedure outlined in IS 2911 Part 1 Section 2: 2010 may be referred and scrupulously followed.
4. Pile load test shall be conducted to ensure the designed pile carrying capacity. The minimum grade of concrete for pile foundation shall be M 30 to M 40.
5. Factor of safety considered for the deep foundation is 2.5 (IS:2911 Part 1 Sec-2 Clause 6.8.2).
6. For pile group spacing the centre to centre spacing should be more than 3 times the chosen diameter of the pile.

7. Group pile efficiency may vary based on the number of piles chosen for the construction.
8. Bored cast in situ pile construction requires temporary casing or bentonite stabilization during the construction; it may depend on the environment and water table.
9. Rotary drilling or augering may use for the bored cast in situ pile construction.
10. Initial load test should be conducted on a test pile or on a working pile ensure the design pile load carrying capacity (Axial and Lateral Capacities).
11. The TDS and chemical content of ground water may be checked and ensured that they are not exceeding the permissible limits prior to the use of same for construction activities.

For Shanmugha Geotech

P.Kalpana M.E.,

Geotechnical Engineer

Er.K.Shanmugam.B.E. (Civil) M.S. (Engg)

Managing Director

M/s.ShanmughaGeotech/SM Associates

Chennai - 600024

Annexure - A-1

Field Bore log Profile

FIELD BORE LOG PROFILE

Project: Proposed Construction of (G+3) Residential Building at Vadapalani, Chennai.

BH NO.	BH-1	DATE OF START	22.12.2024
SITE	vadapalani, Chennai	DATE OF COMPLETION	22.12.2024
DIA OF BORING	100 / 150 mm	GROUND WATER LEVEL (m)	4.0(SPT)
TYPE OF BORING	Rotary	RL with respect to bed level (m)	0

Depth below EGL (m)	Soil / Rock Profile	Description / Classification of Soil and Rock	Standard Penetration Test (SPT)/UDS/Core Drilling				Relative Density or Consistency of soil / Strength of rock
			15	30	45	N	
1.0		Filling Soil	4	5	5	10	
2.0		Brownish Silty Sand (SM)	6	6	8	14	Medium Dense
3.0		Brownish Sand (SP)	6	11	15	26	Medium Dense
4.5		Brownish Sand (SP)	8	12	18	30	Dense
6.0		Brownish Sand (SP)	10	19	22	41	Dense
7.5		Brownish Sand (SP)	n Test (SP	16	20	36	Dense
9.0		Brownish Sand (SP)	8	14	40	54	Dense
10.5		Brownish Sand (SP)	12	18	31	49	Dense
12.0		Greyish Silty Clay (CH)	5	7	9	16	Very Stiff

Bore hole has been terminated at 12.0m from the existing ground level (EGL)

FIELD BORE LOG PROFILE

Project: Proposed Construction of (G+3) Residential Building at Vadapalani, Chennai.

BH NO.	BH-2	DATE OF START	23.12.2024
SITE	vadapalani, Chennai	DATE OF COMPLETION	24.12.2024
DIA OF BORING	100 / 150 mm	GROUND WATER LEVEL (m)	4.0(SPT)
TYPE OF BORING	Rotary	RL with respect to bed level (m)	0

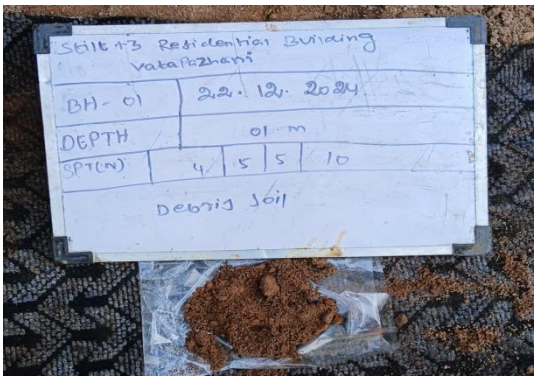
Depth below EGL (m)	Soil / Rock Profile	Description / Classification of Soil and Rock	Standard Penetration Test (SPT)/UDS/Core Drilling				Relative Density or Consistency of soil / Strength of rock
			15	30	45	N	
1.0		Filling Soil	3	4	4	8	
2.0		Brownish Sand (SP)	6	8	11	19	Medium Dense
3.0		Brownish Silty Sand (SM)	8	9	14	23	Medium Dense
4.5		Brownish Sand (SP)	20	22	28	50	Very Dense
6.0		Brownish Sand (SP)	18	24	29	53	Firm (Medium)
7.5		Brownish Silty Sand (SM)	16	20	23	43	Firm (Medium)
9.0		Greyish Sandy Clayey Silt (CI)	4	5	7	12	Stiff
10.5		Greyish Sandy Clayey Silt (CI)	5	6	7	13	Stiff
12.0		Greyish Sandy Clayey Silt (CI)	3	4	7	11	Firm (Medium)
14.0		Greyish Silty Clay (CH)	4	6	7	13	Dense
16.0		Greyish Silty Clay (CH)	3	4	4	8	Very Stiff
18.0		Greyish Silty Clay (CH)	4	4	5	9	Very Stiff
20.0		Greyish Sandy Clayey Silt (CI)	3	4	4	8	Hard
22.0		Greyish Sandy Clayey Silt (CI)	3	4	6	10	Hard
24.0		Greyish Sandy Clayey Silt (CI)	6	6	6	12	Hard
26.0		Greyish Silty Sand (SM)	8	10	11	21	
28.0		Greyish Sandy Clayey Silt (CI)	17	28	30	58	Very Dense

Bore hole has been terminated at 28.0m from the existing ground level (EGL)

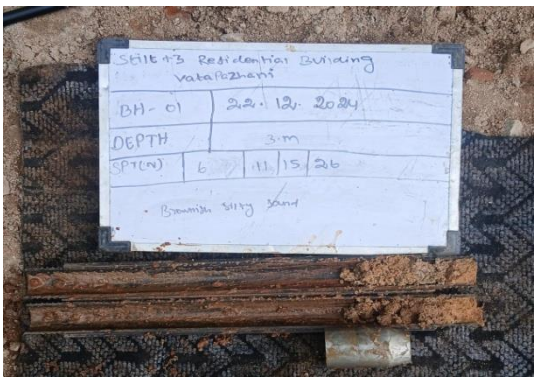
SPT test in progress at BH 1 in the proposed construction site.

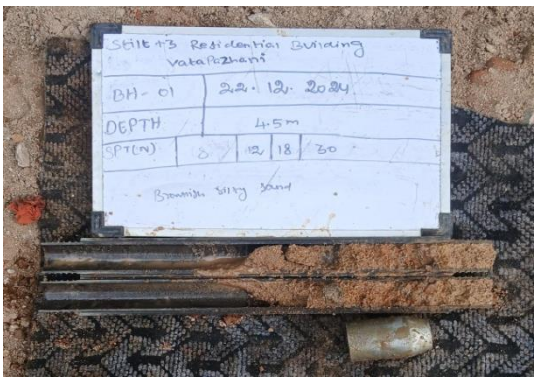


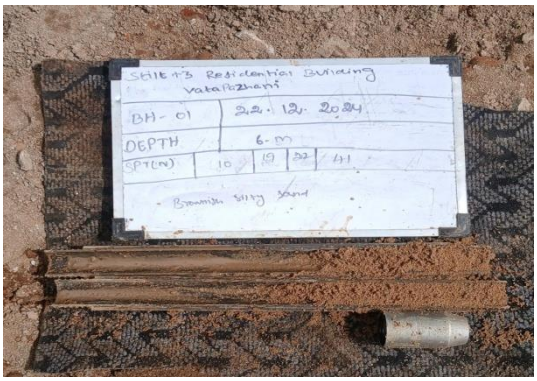
Soil Sample Collected by conducting SPT – BH 1





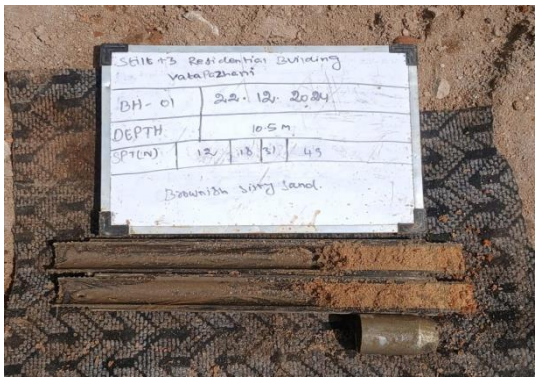









Stilt+3 Residential Building
Vatakkemeni
BH-01
22.12.2024
DEPTH
9.0m
SPT(N)
8
14
40
54
Brownish silty sand.

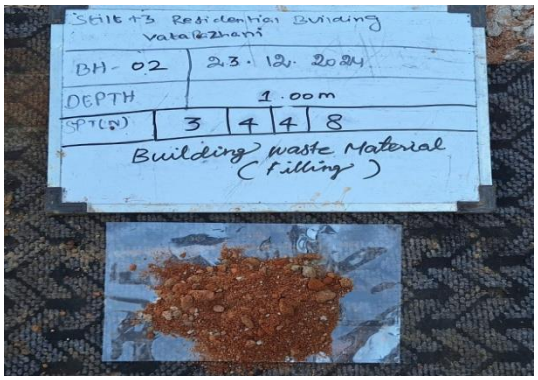

Stilt+3 Residential Building
Vatakkemeni
BH-01
22.12.2024
DEPTH
10.5m
SPT(N)
12
18
21
49
Brownish silty sand.

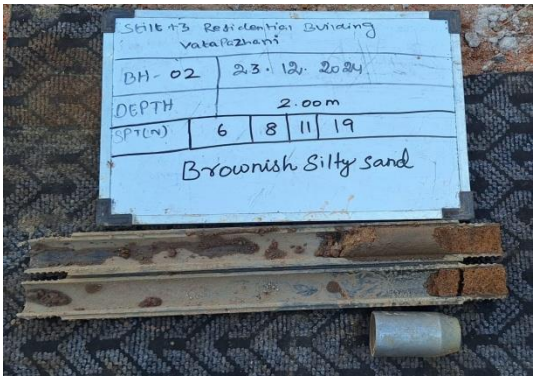

Stilt+3 Residential Building
Vatakkemeni
BH-01
22.12.2024
DEPTH
12.00m
SPT(N)
5
7
9
16
Brownish clayey silty sand

SPT test in progress at BH 2 in the proposed construction site.

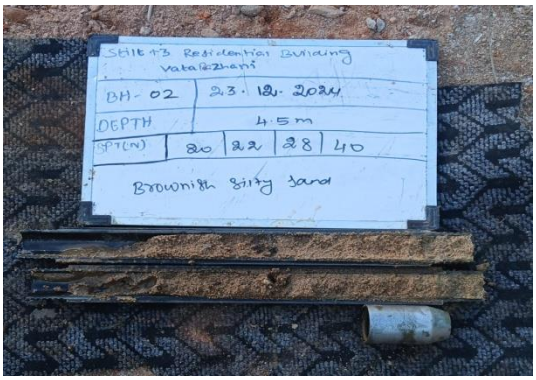


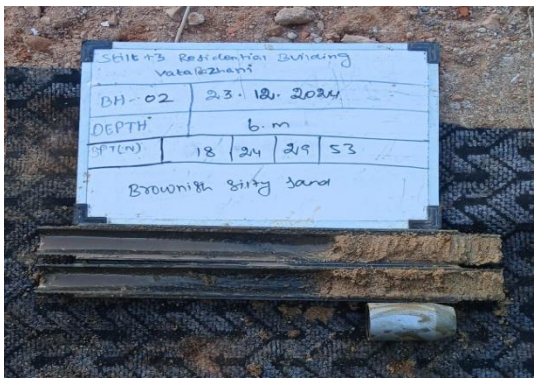
Soil Sample Collected by conducting SPT – BH 2


















Stilt+3 Residential Building
Vatakkenchery
BH-02 23.12.2024
DEPTH 12.00m
SPT(N) 3 4 7 11
Blackish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH-02 23.12.2024
DEPTH 14.00m
SPT(N) 4 6 7 13
Blackish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 16.00m
SPT(N) 3 4 4 8
Greyish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 18.00m
SPT(N) 4 4 5 9
Greyish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 20.00m
SPT(N) 3 4 4 8
Greyish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 22.00m
SPT(N) 3 4 6 10
Greyish silty clay


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 24.00m
SPT(N) 6 6 6 12
Greyish clayey silty sand...


Stilt+3 Residential Building
Vatakkenchery
BH- 24.12.2024
DEPTH 26.00m
SPT(N) 8 10 11 21
Greyish clayey silty sand...


SHILP-3 Residential Building
Vakalpudi
BH-
24. 12. 2024
DEPTH
28.00m
SPT(N)
17
28
30
58

Annexure - A-2

Laboratory Test Results

TABLE - 1

PROJECT: Proposed Construction of (G+3) Residential Building at Vadapalani, Chennai.

BH No:	1		Ground Water Level (m)	4.00 (SPT Bore)

LABORATORY TEST RESULTS

Depth (m)	SPT 'N' Value	Description/Classification of Soil	Index Properties						Specific Gravity	Grain Size Analysis (%)						*Direct Shear/Terzaghi and Peck (1974) - Shear Strength Parameters	
			Natural Moisture Content (NMC), (%)	Bulk Density (kN/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Free Swell Index		Gravel	Coarse Sand	Medium Sand	Fine Sand	Fines		Cohesion (c) kN/m^2	Angle of Friction (ϕ) in Degrees
														Silt	Clay		
1.0	10	Filling Soil															
2.0	14	Brownish Silty Sand (SM)	14	18.40	NP	NP	NP	NP	2.653	7	6	44	29	13		-	31.2
3.0	26	Brownish Sand (SP)	15	19.60	NP	NP	NP	NP	2.654	9	5	52	24	11		-	34.8
4.5	30	Brownish Sand (SP)	15	20.00	NP	NP	NP	NP	2.654	3	5	66	18	7		-	36
6.0	31	Brownish Sand (SP)	13	20.10	NP	NP	NP	NP	2.653	1	4	66	27	2		-	36.2
7.5	36	Brownish Sand (SP)	20	20.60	NP	NP	NP	NP	2.657	0	0	63	33	3		-	37.2
9.0	54	Brownish Sand (SP)	21	22.00	NP	NP	NP	NP	2.658	0	0	66	31	3		-	40
10.5	49	Brownish Sand (SP)	17	21.90	NP	NP	NP	NP	2.655	0	0	52	39	8		-	39.8
12.0	16	Greyish Silty Clay (CH)	21	20.91	53	31	22	57	2.686	0	0	2	7	91		106.5	-

Note: * Shear strength parameters were derived as per Terzaghi and Peck Correlation (1974). NP - Non Plastic

TABLE - 2

PROJECT: Proposed Construction of (G+3) Residential Building at Vadapalani, Chennai.

BH No:	2		Ground Water Level (m)	4.00 (SPT Bore)

LABORATORY TEST RESULTS

Depth (m)	SPT 'N' Value	Description/Classification of Soil	Index Properties						Specific Gravity	Grain Size Analysis (%)						*Direct Shear/Terzaghi and Peck (1974) - Shear Strength Parameters	
			Natural Moisture Content (NMC), (%)	Bulk Density (kN/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Free Swell Index		Gravel	Coarse Sand	Medium Sand	Fine Sand	Fines		Cohesion (c) kN/m^2	Angle of Friction (ϕ) in Degrees
														Silt	Clay		
1.0	8	Filling Soil															
2.0	19	Brownish Sand (SP)	13	18.90	NP	NP	NP	NP	2.653	0	0	67	29	4		-	32.7
3.0	23	Brownish Silty Sand (SM)	13	19.30	NP	NP	NP	NP	2.653	0	0	41	42	17		-	33.9
4.5	50	Brownish Sand (SP)	19	21.00	NP	NP	NP	NP	2.659	6	4	58	28	4		-	38
6.0	53	Brownish Sand (SP)	18	22.00	NP	NP	NP	NP	2.658	0	3	70	25	2		-	40
7.5	43	Brownish Silty Sand (SM)	13	21.30	NP	NP	NP	NP	2.653	1	3	41	40	15		-	38.6
9.0	12	Greyish Sandy Clayey Silt (CI)	26	20.11	41	31	10	45	2.687	0	0	7	25	68		78.5	-
10.5	13	Greyish Sandy Clayey Silt (CI)	25	20.34	38	29	9	44	2.686	0	0	3	34	63		85.5	-
12.0	11	Greyish Sandy Clayey Silt (CI)	31	19.89	43	30	13	42	2.691	3	2	17	13	65		71.5	-
14.0	13	Greyish Silty Clay (CH)	32	20.34	57	32	25	68	2.692	0	0	1	1	98		85.5	-
16.0	8	Greyish Silty Clay (CH)	42	19.20	54	33	21	61	2.695	0	1	0	12	87		50	-
18.0	9	Greyish Silty Clay (CH)	31	19.43	54	33	21	61	2.692	1	1	5	6	87		57	-
20.0	8	Greyish Sandy Clayey Silt (CI)	44	19.20	44	33	11	47	2.696	0	1	13	11	75		50	-
22.0	10	Greyish Sandy Clayey Silt (CI)	30	19.66	36	22	14	40	2.690	5	2	18	21	54		64.5	-
24.0	12	Greyish Sandy Clayey Silt (CI)	26	20.11	36	22	14	41	2.687	1	3	29	10	57		78.5	-
26.0	21	Greyish Silty Sand (SM)	19	19.10	NP	NP	NP	NP	2.659	0	0	14	65	21		-	33.3
28.0	58	Greyish Sandy Clayey Silt (CI)	11	22.40	44	31	13	48	2.682	4	3	18	17	58		200	-

Note: * Shear strength parameters were derived as per Terzaghi and Peck Correlation (1974). NP - Non Plastic

THE LANDLENS SUITE

Eight ways to know a piece of land before you pay for it.

This report covers one part of the picture. These cover the rest, drawn from the same government records, for any property in Tamil Nadu.

LandLens One
Ask anything about a property and get an answer grounded in live government records, with the sources shown.
/landlens/one

Verify My Land
Every record check run on one property and returned as a single report.
/landlens/verify-my-land

Legal Opinion
An advocate's written opinion on the title, built on the records we pull for it.
/landlens

One Map
Every layer on one map: the parcel, its boundary, zoning, water bodies and what sits around it.
/landlens/one/map

PriceMap
What land actually changed hands for around this plot, taken from the registered deeds.
/landlens/pricemap

Build Scope
What you are allowed to build here: floor space, height, coverage and setbacks.
/landlens/build-scope

Property Tracker
Watch a property and hear about it when something new is registered against it.
/landlens/property-tracker

Deal Room
Run the transaction in one place: documents, stamping, signatures and the parties.
/landlens/deal-room

FREE TOOLS · NO ACCOUNT NEEDED

Twenty-four checks you can run yourself, at no cost.

Records and verification

The registers themselves, read for you.

- Encumbrance Certificate
- Patta and Chitta
- Field Measurement Sketch
- EC Analyzer
- Bank charge check
- Court case search
- Seller background check
- Approval check by survey

Value and duty

What it is worth and what it costs to register.

- Guideline value by street
- Guideline value by survey
- Stamp duty and registration fees
- Capital gains
- Floor space index
- Area unit converter

Zoning and land use

What the plan says can happen on this land.

- Land use zone finder
- CMDA land use check
- Coastal regulation zone
- Master plan check
- Water bodies finder
- Airport height clearance

Registers and directories

Who holds it, and which office keeps the record.

- Find your registering office
- Temple property check
- Waqf property check
- RERA register

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

Verified RealEstate™

Every claim in this document traces back to a government record.

- Legal opinions, due diligence and title verification
- Building plan, layout and sub-division approvals
- Completion and occupancy certificates, regularisation
- Escrow, negotiation and NRI property management
- Land survey, soil testing, architecture and construction

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Prepared from the registers named on the page each finding sits on. Where a register could not be read, this document says so in its place rather than leaving the gap to be read as a clean result.