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SOIL INVESTIGATION REPORT

Report No : **AY/JAN/2024/4**

NAME OF PROJECT :

Soil Investigation for the Construction of (S+3) Residential building at Plot No.A-43, Hindu Colony, 5th Cross Street, Nanganallur, Chennai-61.



BH I

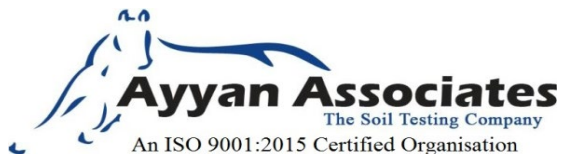


BH II

Client :

Seetha Kannan

Soil Investigation carried out by :



Soil Testing - Stability Certificate - Load Test - Ground Improvement - Construction

No.16/47, Buddhar Street, V.S.A Nagar (Near villivakkam), Chennai-82.

Mobile – 98418 32444.

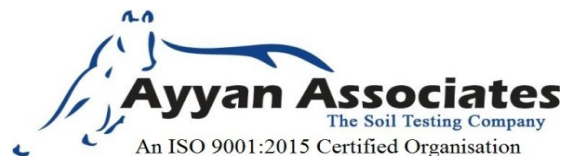
Email : ayyansoiltest@gmail.com

www.ayyanassociates.com

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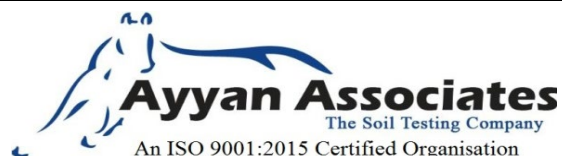
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Soil Investigation for the Construction of (S+3) Residential building at Plot No.A-43, Hindu Colony, 5th Cross Street, Nanganallur, Chennai-61.

CONTENTS

Sl.No	Description
1	Report
2	Bearing Capacity Calculation
3	Consolidated Soil Test Results
4	Bore log
5	Bore Hole Location
6	Photos



Soil Testing - Stability Certificate - Load Test - Ground Improvement - Construction

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REPORT

SOIL EXPLORATION REPORT

Name of Project: Soil Investigation for the Construction of (S+3) Residential building at Plot No. A-43, Hindu Colony, 5th Cross Street, Nanganallur, Chennai-61.

Period of test: 09-01-2024 to 10-01-2024

1. INTRODUCTION

"Seetha kannan" has proposed to Construct S+3 Residential buildings at Plot No. A-43, Hindu Colony, 5th Cross Street, Nanganallur, Chennai-61. For the construction of any structure a detailed soil investigation is essential for collecting the relevant data required for preparing the design. The sub surface investigation reveals the presence and the extent of soil and rock stratum in the region likely to be affected by the proposed work and determines the nature of each stratum and engineering properties of soil which may affect the design.

In this context the client required to have Preliminary soil investigations to understand the soil conditions for construction of S+3 Residential buildings with the proposed Plot area of 6000sft. The data collected provides reliable, specific and detailed information to facilitate a safe and economic design for the estimation of the proposed structure.

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 100mm diameter up to a depth of 10.00m below the existing ground level or where the SPT value is >100 or 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.
- ❖ Conducting relevant laboratory test results as instructed.

- ❖ Assessing Safe bearing capacity and allowable bearing pressure based on the field and laboratory test carried out in the soil stratum encountered.
- ❖ The type and depth of foundation for the proposed structure has to be recommended for estimation.

1.2 Structure of the Report

1. Introduction
2. Field Investigation Methodology & Lab Test
3. Sub-Surface Stratification
4. Foundation Systems
5. Recommendations

Annexure

- ❖ Design Computations
- ❖ Laboratory Test Results
- ❖ Bore Logs
- ❖ Field Test Location Drawing
- ❖ Photos

2. Field Investigation Methodology & Lab Test

2.1 Field Testing:

Penetration and sounding tests are the generally adopted field Tests. The Standard Penetration Test is performed as per I.S. 2131-1981 as an in-situ test especially for cohesion less soils. The resistance is empirically correlated with some of the Engineering properties of soil such as density index, consistency, bearing capacity, etc. These tests are useful for general exploration of erratic soil profiles for finding depth to bedrock or hard stratum and to have an approximate indication of the strength and other properties of soils, particularly for cohesion less soil where it is difficult to obtain U.D.S.

The proposed site is situated in the developing area. The exploration was carried out during the Post rainfalls in the city. Two boreholes were made at the locations specified by the client.

The locations of the boreholes are shown in the site plan attached. 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 Calyx Rotary Drill Rig using cutting augers with circulating bentonite slurry.

2.2.2 Methodology of drilling

Calyx rotary drilling with auger of 100mm dia has been used for making bore holes duly circulating bentonite slurry. In this method, the advancement of boring is made by the cutting action of a rotating bit that is kept in firm contact with the bottom of the hole. The bit is attached to the lower end of hollow drill rod, which is rotated by a suitable chuck. Drilling mud, (viz) bentonite is continuously forced down the hollow drill rods. The mud returning upward through the annular space between the drill rods and side of the hole brings the soil particles to the surface.

The soil exploration consists of three stages i.e., boring, sampling and testing which includes both field and lab tests. Samples were collected at every 1.00 m up to 5m depth and at every 1.5m up to 10m depth of the bore hole. Samples were properly labeled for Lab tests. Bore log particulars and location of bore holes are annexed with this report.

2.3 In-Situ Strength Tests:

2.3.1 Standard Penetration Test:

In the field test the Standard Penetration Test sampler is driven by the free fall of a hammer weighing 63.50kg dropped from a height of 76cm. The sampler is initially driven through 15cm as a seating drive. It is further driven through 30cm. The number of blows required to drive the sampler 30cm below the seating drive is termed the penetration resistance 'N'. Standard penetration tests were conducted at the borehole locations, in accordance with IS: 2131. The Samples were collected at every 1.00 m up to 5m depth and at every 1.5m up to 8m depth of the bore holes 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.

2.5 Summary of Field Work

- Two boreholes were made up to 10.0m or N value > 100.
- Standard Penetration Test (SPT) at regular intervals was conducted and Disturbed Soil Samples were collected.
- The locations of the boreholes are shown in site plan attached.
- The soil profiles obtained at each location is shown in the tables attached.

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 Laboratory Test Results.

2.6.2 Fine Grained Samples:

2.6.2.1 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 types of strata encountered at the investigation locations, such tests were conducted and the test results are presented in tables.

3. SUB-SURFACE STRATIFICATION

3.0 Preamble

The details of soil conditions encountered at the Bore Hole locations are presented in this chapter based on visual identification, laboratory testing and other engineering characteristics derived from SPT-value which are having correlation with strength parameters.

The stratigraphy of the soil in BH1 is comprised of Silty Sand layer in the top 2.0m and from 3.0m to 5.0m. Clayey Sand layer is present from 2.0m to 3.0m. Sandy Gravel layer is present from 5.0m to 6.50m. Below 6.5m, there is Weathered Rock layer.

The stratigraphy of the soil in BH2 is comprised of Clayey Sand layer in the top 3.0m. Sandy Gravel layer is present from 3.0m to 4.0m. Below 4m, there is Weathered Rock layer.

The top soil is having differential free swell of 25% based on the free swell index carried out according to IS: 2720 (Part. XL)-1977. As per the appendix A under clause 3.1(b) of IS 2911 (Part III) -1980, the qualitative indication of the degree of expansiveness of the soil is Moderate. The relative compaction of the Sandy Stratum is Medium Dense to Very Dense.

3.1 Water Table

Water level was met with during the borehole operations at the depth of about 0.50m from existing ground level. The water level might be due to the influence of Bentonite slurry. Actual water level has to be confirmed before foundation excavation.

4. FOUNDATION SYSTEM

4.0 Preamble

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, suitable type of foundation system with respect to the sub soil conditions encountered at the borehole locations is presented in the subsequent sections.

4.1 Bearing Strata Characteristics

At the investigation locations, it can be observed that the sub-soil strata are non- uniformly stratified with some variation. The sub-soil stratum at the location of borehole is clayey at the shallow depths.

4.2 Proposed Foundation System

Considering the sub soil conditions encountered at the investigation locations, the foundation system discussed below is technically viable solution and depending upon the relative economics and construction feasibility the foundation system discussed below can be adopted. The top layer up to 3.00 m is considered for shallow foundation. The water table is considered to be at the ground level in worst conditions.

The bearing capacity has been assessed as per the IS 6403: 1981 based on the field test (SPT) conducted at site as per IS 2131:1981. The allowable bearing pressure is calculated as per IS 8009(Part I)-1976 (Reaffirmed 1998). A factor of safety of 3 has been adopted to arrive at the safe bearing capacity.

Since the structural design is not yet done for the proposed building, the maximum column load is not known. Therefore, the bearing capacity for different type of foundation is calculated.

The calculated allowable bearing pressure for isolated footing is listed in the table for the maximum footing size of 3.0m x 3.0m at the depth of 2.0m and 3.0m from the existing ground level.

BH No	ISOLATED FOOTING		Calculated Safe allowable bearing pressure in kN/m ²	Total settlement in mm
	Assumed Size	Depth		
BH 1	3.0m x 3.0m	2.0m	180 kN/m ²	23 mm
		3.0m	250 kN/m ²	20 mm
BH 2	3.0m x 3.0m	2.0m	180 kN/m ²	14 mm
		3.0m	250 kN/m ²	17 mm

The calculated allowable bearing pressure for strip raft foundation is listed in the table for the maximum footing size of 1.5 m x 10.0m at the depth of 2.0m and 3.0m from the existing ground level.

BH No	STRIP RAFT FOUNDATION		Calculated Safe allowable bearing pressure in kN/m ²	Total settlement in mm
	Assumed Size	Depth		
BH 1	1.5m x 10.0m	2.0m	140 kN/m ²	13 mm
		3.0m	200 kN/m ²	11 mm
BH 2	1.5m x 10.0m	2.0m	140 kN/m ²	6 mm
		3.0m	200 kN/m ²	7 mm

Based on the above assessment the conclusion and recommendation are furnished below

5. CONCLUSIONS & RECOMMENDATIONS

5.1 Foundation Type – I :(Isolated footing)

- The recommended safe bearing capacity considering Isolated Foundation for a foundation size of 3.0m X 3.0m is **180 kN/m²** at the depth of about **2.00m** from the existing lowest ground level.
- Under the recommended bearing pressure, the settlements of the bearing strata based on Schmertzmann method is within the permissible limits for isolated column footing as per I.S: 1904.

5.2 Foundation Type – II: (Strip Foundation)

- For higher load carrying capacity requirement Strip Raft may be adopted. The recommended safe bearing capacity considering Strip Foundation for a foundation size of 1.50m X 10.0m is **140 kN/m²** at the depth of about **2.00m** from the existing lowest ground level.
- Under the recommended bearing pressure, the settlements of the bearing strata based on Schmertzmann method is within the permissible limits for Strip footing.

5.3 General Recommendations:

1. The calculations are theoretical and have to be confirmed by conducting Plate load test on foundation soil as per relevant standards.
2. For back filling the foundation trench, non-swelling soil may be used with proper layer by layer compaction. The floor may also be raised using non-cohesive material.
3. **Trial pit has to be done in the proposed site to check the feasibility for foundation excavation.**
4. Since the ground water table is at shallow depth the excavation for shallow foundation may be difficult. If the dewatering is found difficult, the excavation may be planned during post rainfall season when the water table is below the excavation level.

5. Proper shuttering arrangements are required during foundation construction work for the stability of excavation cut and the nearby structure.
6. The grade beam may be placed over a minimum 150mm thickness of Compacted CNS soil layer (Cohesive non swelling) spreading at least 150mm in excess on all sides.
7. During the foundation construction, If the ground water level is raised higher than the foundation level due to rain, then continuous dewatering has to be done with proper design to keep the water level 2m below the foundation level.
8. Care shall be taken in locating the foundation system such that the ultimate bearing strata are with "N value" more than 19.
9. The maximum flood level data of the nearby area has to be collected to decide the floor level.
10. The load carrying capacity should not be increased than the recommended values. For higher load carrying capacity requirement, alternate foundation has to be adopted after deep and detailed soil investigation.

This recommendation is based on the stratum available at the borehole locations. When excavations or drilling for foundation are made during execution, it may be verified whether the same stratum is available almost at all the locations. If any change in stratum is observed, it may be brought to our notice for further suggestion or modification of report.



P. ARUN PERUMAL, M.E.(Soil), MIE.
Chartered Engineer (INDIA)
Geo Technical Consultant, Ayyan Associates
16/47, Buddhar Street, V.S.A. Nagar, Chennai-82.

BEARING CAPACITY CALCULATION

BEARING CAPACITY OF SHALLOW FOUNDATIONS

Model Bearing capacity calculations based on IS : 6403-1981 & Settlement by Schmertmann method

Report No : **AY/JAN/2024/4**

Design particulars

Assumed Foundation size and depth

Isolated Column Square Footing

Depth of foundation (D) =	2.00 m	3.00 m
Foundation width (B) =	3.00 m	3.00 m
Foundation Length (L) =	3.00 m	3.00 m
Foundation Shape =	Square	Square

Shear strength parameters

Data from BH: **1**

angle of internal friction correlated/measured (Φ) =	34 ° (deg)	35 ° (deg)
Cohesion correlated/measured =	kPa	kPa
Density of soil (γ) =	16.4 kN/m ³	16.1 kN/m ³
Depth of water table from EGL (D_w) =	0.00 m	0.00 m
Shear failure criterion	Interpolation	Interpolation
Bearing capacity factors Nc and Dc	33.10 1.25	36.89 1.39
Nq and Dq	21.58 1.13	25.09 1.19
Ny and Dy	28.57 1.13	34.60 1.19

Sc/Sq/Sy

1.30
1.20
0.80

UBC = $CNcScDc + q(Nq-1)Dq + 0.5ByNyDyRW'$ (General) or **$(2/3)CN'cScDc + q(N'q-1)Dq + 0.5ByN'yDyRW'$** (Local) or **interpolating both**

Ultimate bearing capacity	538 kPa	808 kPa
Factor of Safety	3.00	3.00

Result

Safe bearing capacity assessed	179 kPa	269 kPa
Allowable bearing pressure	180 kPa	250 kPa
Anticipated Total settlement in 25 years =	23 mm	20 mm

Depending upon anticipated load intensity the foundation may be adopted at suitable depth as recommended below

Depth of foundation (m):	Safe bearing capacity (kPa):
2.00 m	180 kPa 23 mm
3.00 m	250 kPa 20 mm

BEARING CAPACITY OF SHALLOW FOUNDATIONS

Model Bearing capacity calculations based on IS : 6403-1981 & Settlement by Schmertmann method

Report No : **AY/JAN/2024/4**

Design particulars

Assumed Foundation size and depth

Depth of foundation (D) =

Foundation width (B) =

Foundation Length (L) =

Foundation Shape =

Isolated Column Square Footing

2.00 m

3.00 m

3.00 m

3.00 m

3.00 m

3.00 m

Square

Square

Shear strength parameters

Data from BH: **2**

angle of internal friction correlated/measured (Φ) =

37 ° (deg)

37 ° (deg)

Cohesion correlated/measured =

kPa

kPa

Density of soil (γ) =

18.1 kN/m³

18.7 kN/m³

Depth of water table from EGL (D_w) =

0.00 m

0.00 m

Shear failure criterion

General

General

Sc/Sq/Sy

Bearing capacity factors **Nc** and Dc

53.52

1.27

56.52

1.40

1.30

Nq and Dq

40.74

1.13

43.84

1.20

1.20

Ny and Dy

61.99

1.13

67.99

1.20

0.80

UBC = CNcScDc+q(Nq-1)Dq+0.5ByNyDyRW' (General) or **(2/3)CN'cScDc+q(N'q-1)Dq+0.5ByN'yDyRW'** (Local) or **interpolating both**

Ultimate bearing capacity

1217 kPa

1726 kPa

Factor of Safety

3.00

3.00

Result

Safe bearing capacity assessed

406 kPa

575 kPa

Allowable bearing pressure

180 kPa

250 kPa

Anticipated Total settlement in **25** years =

14 mm

17 mm

Depending upon anticipated load intensity the foundation may be adopted at suitable depth as recommended below

Depth of foundation (m):	Safe bearing capacity (kPa):
2.00 m	180 kPa 14 mm
3.00 m	250 kPa 17 mm

BEARING CAPACITY OF SHALLOW FOUNDATIONS

Model Bearing capacity calculations based on IS : 6403-1981 & Settlement by Schmertmann method

Report No : **AY/JAN/2024/4**

Design particulars

Assumed Foundation size and depth

Depth of foundation (D) =

Foundation width (B) =

Foundation Length (L) =

Foundation Shape =

Strip Raft Footing

2.00 m

3.00 m

1.50 m

1.50 m

10.00 m

10.00 m

Rectangle

Rectangle

Shear strength parameters

Data from BH: **1**

angle of internal friction correlated/measured (Φ) =

34 ° (deg)

35 ° (deg)

Cohesion correlated/measured =

kPa

kPa

Density of soil (γ) =

16.4 kN/m³

16.1 kN/m³

Depth of water table from EGL (D_w) =

0.00 m

0.00 m

Shear failure criterion

Interpolation

Interpolation

Sc/Sq/Sy

Bearing capacity factors **Nc** and Dc

33.10 1.50

36.89 1.77

1.00

Nq and Dq

21.58 1.25

25.09 1.39

1.00

Ny and Dy

28.57 1.25

34.60 1.39

1.00

UBC = CNcScDc+q(Nq-1)Dq+0.5ByNyDyRW' (General) or **(2/3)CN'cScDc+q(N'q-1)Dq+0.5ByN'yDyRW'** (Local) or **interpolating both**

Ultimate bearing capacity

423 kPa

689 kPa

Factor of Safety

3.00

3.00

Result

Safe bearing capacity assessed

141 kPa

230 kPa

Allowable bearing pressure

140 kPa

200 kPa

Anticipated Total settlement in **25** years =

13 mm

11 mm

Depending upon anticipated load intensity the foundation may be adopted at suitable depth as recommended below

Depth of foundation (m):	Safe bearing capacity (kPa):	
2.00 m	140 kPa	13 mm
3.00 m	200 kPa	11 mm

BEARING CAPACITY OF SHALLOW FOUNDATIONS

Model Bearing capacity calculations based on IS : 6403-1981 & Settlement by Schmertmann method

Report No : **AY/JAN/2024/4**

Design particulars

Assumed Foundation size and depth

Depth of foundation (D) =

Foundation width (B) =

Foundation Length (L) =

Foundation Shape =

Strip Raft Footing

2.00 m

3.00 m

1.50 m

1.50 m

10.00 m

10.00 m

Rectangle

Rectangle

Shear strength parameters

Data from BH: **2**

angle of internal friction correlated/measured (Φ) =

37 ° (deg)

37 ° (deg)

Cohesion correlated/measured =

kPa

kPa

Density of soil (γ) =

18.1 kN/m³

18.7 kN/m³

Depth of water table from EGL (D_w) =

0.00 m

0.00 m

Shear failure criterion

General

General

Sc/Sq/Sy

Bearing capacity factors **Nc** and Dc

53.52 1.53

56.52 1.81

1.00

Nq and Dq

40.74 1.27

43.84 1.40

1.00

Ny and Dy

61.99 1.27

67.99 1.40

1.00

UBC = CNcScDc+q(Nq-1)Dq+0.5ByNyDyRW' (General) or **(2/3)CN'cScDc+q(N'q-1)Dq+0.5ByN'yDyRW'** (Local) or **interpolating both**

Ultimate bearing capacity

962 kPa

1456 kPa

Factor of Safety

3.00

3.00

Result

Safe bearing capacity assessed

321 kPa

485 kPa

Allowable bearing pressure

140 kPa

200 kPa

Anticipated Total settlement in **25** years =

6 mm

7 mm

Depending upon anticipated load intensity the foundation may be adopted at suitable depth as recommended below

Depth of foundation (m):	Safe bearing capacity (kPa):
2.00 m	140 kPa 6 mm
3.00 m	200 kPa 7 mm

TEST RESULTS

Table of Laboratory Test Results

Report No : AY/JAN/2024/4

Bore Hole No	Depth (m)		SPT Depth (m)	N Value	Type of Soil	Grain Size Analysis (Particle Retained in IS Sieve) %					Atterberg Limits			IS Classification	Natural Moisture Content %	Free swell (%)	Liquidity Index (NMC-PL)/PI	Remarks
	From	To				Gravel (4.75 mm)	Coarse Sand (2.00 mm)	Medium Sand (0.425 mm)	Fine Sand (0.075 mm)	Silt & Clay (<0.075mm)	LL	PL	PI					
BH 1	0.00	2.00	1.00	11	Silty Sand	5.95	11.71	50.52	23.63	8.19				SM	18.16			
	2.00	3.00	2.00	19	Clayey Sand	27.14	16.70	15.32	10.59	30.24				SC	16.33			
	3.00	4.00	3.00	17	Silty Sand	21.71	22.81	23.11	14.44	17.93				SM	17.90			
	4.00	5.00	4.00	100	Silty Sand	7.74	22.80	33.31	18.33	17.81				SM	12.18			
	5.00	6.50	5.00	100	Sandy gravel	21.21	20.47	34.90	15.17	8.25					10.31			
	6.50	8.00	6.50	100	No Sample													
	8.00	8.00	8.00	100	No Sample													
BH 2	0.00	2.00	1.00	16	Clayey Sand	0.16	9.23	27.78	24.34	38.49				SC	16.93	24.14		
	2.00	3.00	2.00	41	Clayey Sand	21.62	16.93	24.14	16.26	21.05				SC	8.53			
	3.00	4.00	3.00	34	Sandy gravel	37.57	17.85	21.96	12.29	10.33					8.98			
	4.00	5.00	4.00	100	No Sample													
	5.00	6.00	5.00	100	No Sample													
	6.00	6.00	6.00	100	No Sample													

AS - Augur Sample

BORE LOG

Report No : **AY/JAN/2024/4**

BH No	1	RL of the EGL	m		Water level				0.50 m below ground level						
Date of commencement			09-01-2024			Type of Drilling				Calyx Rotary drilling					
Date of completion			09-01-2024			Dia of Bore hole				100 mm					
Depth from RL (m)	Description of soil stratum	Soil profile	Thickness of layer	Standard Penetration Test					Relative density / consistency	Graphical representation of penetration resistance					
				Depth	Number of blows										
					I	II	III	N		0 20 40 60 80 100					
0.00	Existing ground level														
2.00	Brown Silty Sand (Filled up soil)		2.00												
				1.00	6	5	6	11	Medium Dense						
3.00	Brown Clayey Sand with Stones		1.00	2.00	6	9	10	19	Medium Dense						
5.00	Brown Silty Sand (Weathered Stones)		2.00	3.00	4	5	12	17	Medium Dense						
				4.00	46	50 [#]		>100	Very dense						
					#50 blows for 5cm penetration										
6.50	Brown Sandy gravel (Weathered Stones)		1.50	5.00	50 [#]			>100	Very dense						
					#50 blows for 10cm penetration										
8.00	Weathered Rock		1.50	6.50	50 [#]			>100	Very dense						
					#50 blows for 4cm penetration										
				8.00	50 [#]			>100	Very dense						
				#50 blows for no penetration											
Bore Hole terminated at 8 m															

BORE LOG

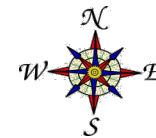
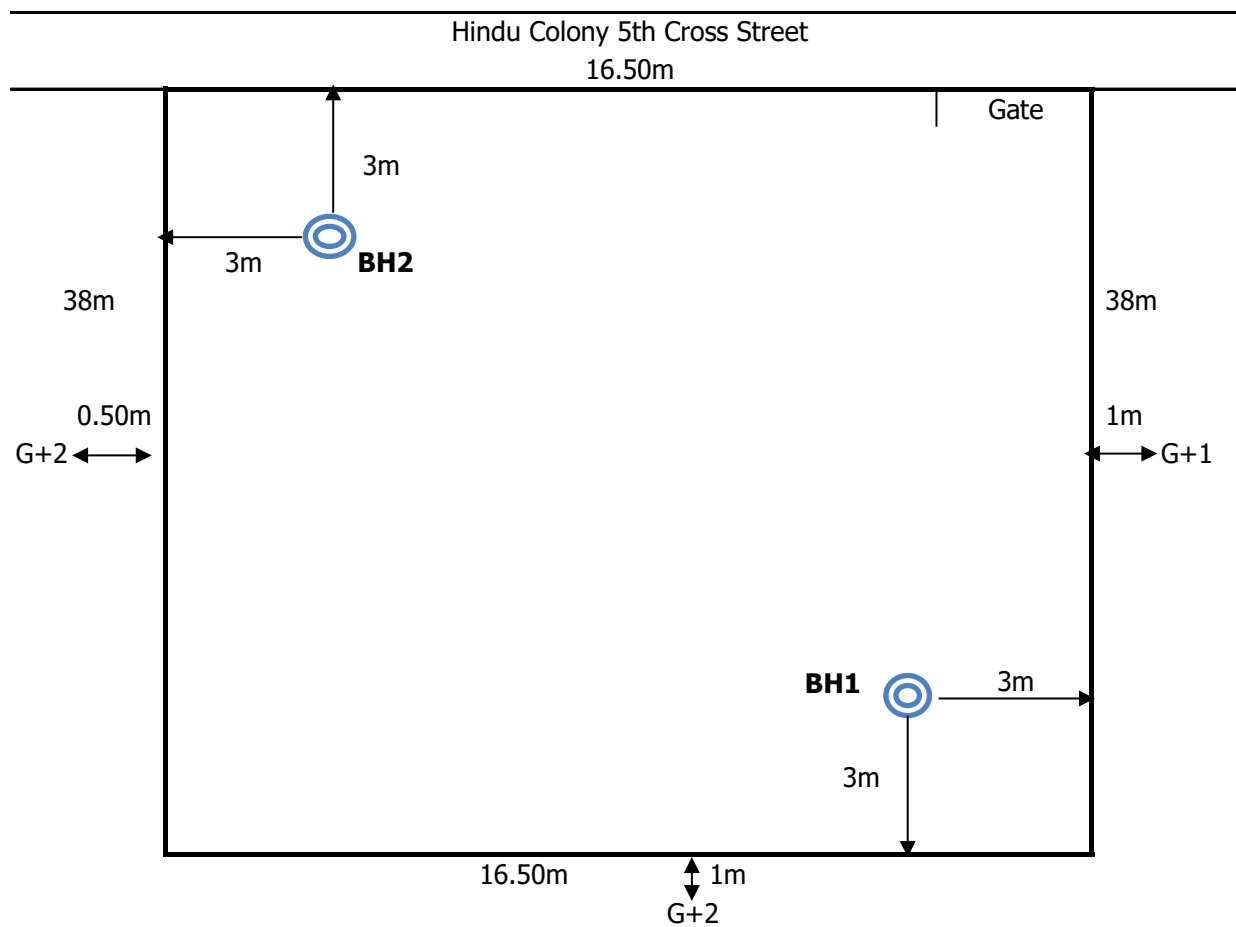
Report No : **AY/JAN/2024/4**

BH No	2	RL of the EGL	m		Water level				0.50 m below ground level					
Date of commencement			10-01-2024			Type of Drilling				Calyx Rotary drilling				
Date of completion			10-01-2024			Dia of Bore hole				100 mm				
Depth from RL (m)	Description of soil stratum	Soil profile	Thickness of layer	Standard Penetration Test					Relative density / consistency	Graphical representation of penetration resistance				
				Depth	Number of blows									
					I	II	III	N		0 20 40 60 80 100				
0.00	Existing ground level													
1.45	Filled up soil		1.45											
				1.00	5	7	9	16	Medium Dense					
2.00	Brown Clayey Sand		0.55											
				2.00	17	19	22	41	Dense					
3.00	Brown Clayey Sand (Weathered Stones)		1.00											
				3.00	21	15	19	34	Dense					
4.00	Brown Sandy gravel (Weathered Stones)		1.00											
				4.00	41	50 [#]		>100	Very dense					
6.00	Weathered Rock		2.00		#50 blows for 6cm penetration									
				5.00	50 [#]			>100	Very dense					
					#50 blows for 4cm penetration									
				6.00	50 [#]			>100	Very dense					
					#50 blows for no penetration									
Bore Hole terminated at 6 m														

BOREHOLE LOCATION

BORE HOLE LOCATION

Report No : AY/JAN/2024/4



Not to scale

PHOTOS

Photo

Report No : AY/JAN/2024/4



BH 1



BH1 - 3m Sample

Photo

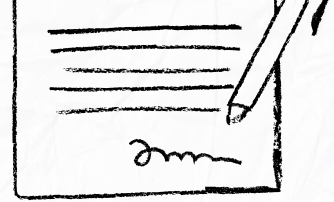
Report No : AY/JAN/2024/4



BH 2



BH2 - 3m Sample



our services doesn't just end there



Buying & Selling Services

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



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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.



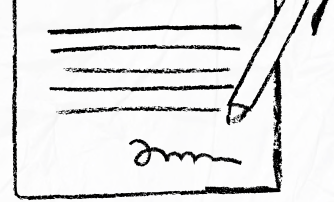
NRI & Investment Services

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



Compliance & Special Services

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



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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



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

hello@verified.realestate
[+91 9996 12 9996](tel:+919996129996)
www.verified.realestate