GEO TECHNICAL INVESTIGATION REPORT

REPORT No.: **GT / 3355 – 2 / 2024-25**

PROJECT: **Proposed Building "Tamanna Paradise" in MES Colony, Alwal, Hyderabad**

CLIENT: **M/s AVISON Properties**

DURATION: **April 2024**

GEOTECHNICAL CONSULTANTS:

GEO TECHNOLOGIES

ISO 9001:2015 COMPANY

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1. INTRODUCTION

M/s Avison Properties LLP have engaged M/s Geo Technologies as Consultant to carryout geotechnical investigation work for the proposed building “Tamanna Paradise” in MES Colony, Alwal, Hyderabad.

Soil investigation was conducted by drilling one (1) borehole.

This report presents the results and recommendations for foundations.

2. FIELD INVESTIGATIONS

DRILLING:

The bore hole was drilled at the location specified by the client (Fig.1).

Rotary Drilling was performed as per IS: 1892. The size of the casing used was 150 / 90 mm.

The following information was collected during the drilling operations:

- Nature of strata
- Details of soil samples
- Colour of Return Water
- Rate of drilling

STANDARD PENETRATION TEST (SPT):

Standard Penetration Tests were conducted at 1.5 m depth intervals in soil, in accordance with IS: 2131-1981. Soil samples were carefully extracted from the split-spoon sampler and preserved in polythene bags.

SAMPLES:

Soil samples were collected as per IS: 2132. All the samples collected from the bore hole were properly packed, labeled and transported to Geo Technologies Soil Testing Laboratory at Hyderabad.

FIELD BORE LOGS:

All the details collected from the field operations are presented in Log of Bore hole in Annexure-1 at the end of this Report. These logs contain depth wise strata details, depth and type of soil samples collected, results of Standard Penetration Tests and color of return water etc.

3. LABORATORY TESTING

The following tests were performed on the Soil samples:

- Specific gravity
- Density
- Grain size distribution
- Shear tests

All the tests were conducted in accordance with IS: 2720 (Methods of Tests for Soils).

No cores were recovered in SDR strata.

4. RESULTS

Fig. 1 gives the site plan showing the location of the borehole.

Fig. 2 gives the bore log.

Table 1 gives the results of lab tests of soil samples.

Appendix gives the typical calculations for SBC.

Annexure-1 gives the field bore log chart.

Annexure-2 gives the BIS Codes.

5. SUBSOIL PROFILE

The subsoil profile in lthe borehole is as follows:

Depth below NGL, m	Strata	N value
0.0 – 1.5	Filling	-
1.5 – 4.5	Silty gravel	16 – 19
4.5 – 10.0	Soft Disintegrated Rock (SDR)	>50

At the time of drilling, no water table was seen in the borehole.

6. RECOMMENDATIONS

The following recommendations are made for the proposed building "Tamanna Paradise" in MES Colony, Alwal, Hyderabad. These are based on drilling of a single bore hole.

Subsoil Profile:

1. The subsoil profile in the borehole is as follows:

Depth below NGL, m	Strata	N value
0.0 – 1.5	Filling	-
1.5 – 4.5	Silty gravel	16 – 19
4.5 – 10.0	Soft Disintegrated Rock (SDR)	>50

2. At the time of drilling, no water table was seen in the borehole.

Foundations and SBC:

3. Open foundations (Isolated footings) are recommended at 2.5 m depth below EGL, to be rested in silty gravel.
4. SBC for foundations is recommended as 20 t/m^2.
5. All Foundations should be back-filled with well-compacted gravelly morum.

For ***GEO TECHNOLOGIES***

GEO TECHNOLOGIES

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TABLE-1: RESULTS OF TESTS ON SOIL SAMPLES

BH No.	D, m	Soil	Sp. Gr.	γ	Grain Size, %			Shear Parameters	
					Gr	Sa	Si+ Cl	C	Φ
				kN / m^3	%	%	%	kN/m^2	deg
BH-1	1.5	Silty gravel	-	18.5	32	37	31	14	30
	3.0	Silty gravel	-	18.7	38	32	30	12	32

Appendix: Typical Calculation of SBC

Foundations in* Silty gravel *at 2.0 m depth:

Based on 'N' Values:

a) Shear criterion:

Allowable bearing pressure is estimated (with F.S. = 3.0) using the equation

q (Allowable) = 1/18 [2 x N x N B Rw + 6 (100 + N x N) D Rq] where,

N = Corrected SPT Value is taken as 14. B = 2 m; D = 2.0 m

Substituting these values in the above equation; q (Allowable) = 240 kN / m^2.

b) Settlement Criterion:

For a settlement of 40 mm (N = 14, B = 2.0 m),

Allowable bearing capacity = 12.25 N [(B + 0.3)/B] = 197 kN / m^2.

***Taking the lower of the two, Recommended* SBC for foundations resting at 2.0 m depth is 20 t / m^2.**

For foundations in gravel at 3.0 m depth, SBC is recommended as 25t / m^2.

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FIG:1 SITE PLAN SHOWING THE LOCATIONS OF BORE HOLES

Project: Proposed Building "Tamanna Paradise"
in MES Colony, Alwal, Hyderabad

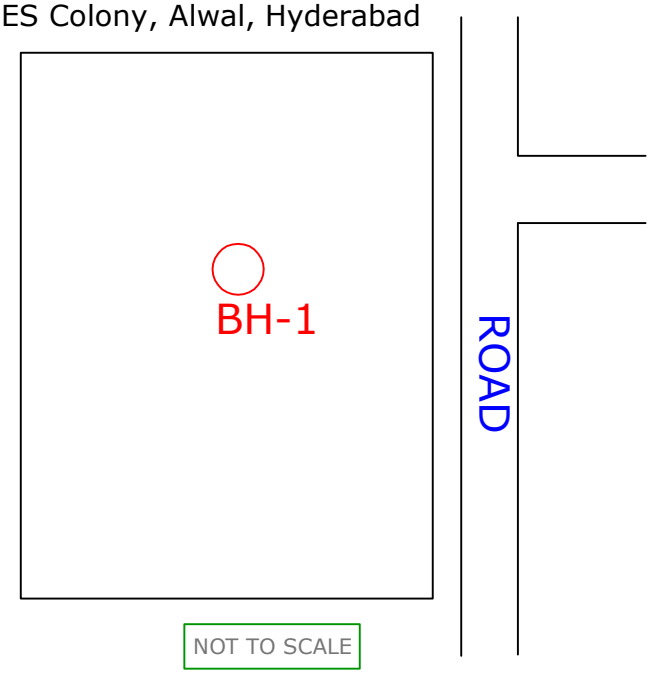

FIG:2 LOG OF BORE HOLES

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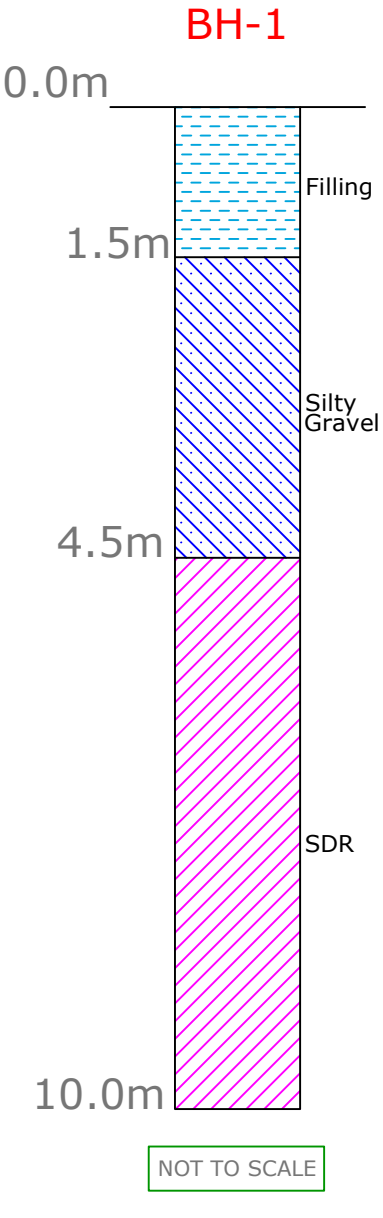
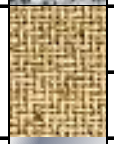
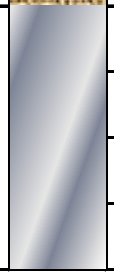


Annexure.1 - FIELD BORE LOG CHART

Project: Avisun Properties LLP - Tamanna Paradise, MES COLONY, Alwal	**BORE HOLE NO. 1**	**Ground Level:**
		Dia. Of Casing: NX
Date : 01-04-2024		**Water Table:**

Depth (m)		Length of Run (m)	Description	Log of Bore	Sampling		SPT		Details of Rock core				RQD Value %	Avg. RQD %	Water colour	Rate of Drill Min/m
From	To				Depth (m)	Type	No. blows for Penetration of (15-30-45)cm	N Value	>10cm core Pieces(cm)	Total Length (cm)	No. of Pieces	% of core Recovery				
0.0	1.5	1.5	Filling		1.50	SPT	7-6-10	16							Reddish	
1.5	3.0	1.5	Silty Gravel		2.50 3.00	D/S SPT	6-7-12	19							Reddish	
3.0	4.5	1.5			4.00 4.50	D/S SPT	18cm/50blows	>50							Reddish	
4.5	6.0	1.5	SDR		5.50 6.00	D/S SPT	16cm/50blows	>50							Brownish	
6.0	7.5	1.5			7.00 7.50	D/S SPT	14cm/50blows	>50							Brownish	
7.5	9.0	1.5			8.00 9.00	D/S SPT	12cm/50blows	>50							Brownish	
9.0	10.0	1.0			9.50	D/S									Brownish	

SDR=Soft Disintigrated Rock cm/50= no.of blows sp=Small pieces vsp=Very Small Pieces

ANNEXURE – 2: IS CODES

1. IS: 1892 – 1962: Code of Practice for Site Investigations for Foundations.
2. IS: 2131 – 1981: Method of Standard Penetration Test for Soils.
3. IS: 2132 – 1986: Code of Practice for thin walled tube sampling of Soils.
4. IS: 4464 – 1985: Code of Practice for presentation of drilling information and core description in foundation investigations.
5. IS: 3043 – 1987: Code of Practice for Earthing – Clause 37: Measurement of Soil Resistivity.
6. IS: 2720 Part 4 – 1985: Methods of Test for Soils – Part 4: Grain size analysis.
7. IS: 1498 – 1970: Classification and Identification of Soils for General Engineering Purpose.
8. IS: 2720 Part 29 – 1975: Methods of Test for Soils – Part 29: Determination of dry density of soils by core-cutter method.
9. IS: 2720 Part 2 – 1973: Methods of Test for Soils – Part 2: Determination of water content.
10. IS: 2720 Part 13 – 1986: Methods of Test for Soils – Part 13: Direct shear test.
11. IS: 2720 Part 2 – 1985: Methods of Test for Soils – Part 2: Determination of water content.
12. IS: 2720 Part 3 / section 2 – 1980: Methods of Test for Soils – Part 3: Determination of Specific gravity; Section 2: Fine, Medium and Coarse Grained Soils.
13. IS: 2720 Part 7 – 1980: Methods of Test for Soils – Part 7: Determination of water content – Dry density relation using light compaction .
14. IS: 2720 Part 16 – 1979: Methods of Test for Soils – Part 16: Laboratory Determination of CBR.
15. IS: 9143 – 1979: Method for determination of unconfined compressive strength of rock materials.
16. IS: 8764 – 1998 Reaffirmed 2008: Method for determination of Point Load Strength Index of rocks.
17. IS: 11315 (Part 2) – 1987: Method for Quantitative Description of Discontinuities in Rock Mass – Part 2: Spacing.
18. IS: 11315 (Part 11) – 1985: Method for Quantitative Descriptions of Discontinuities in Rock Masses – Part 11: Core Recovery and Rock Quality Designation.
19. IS: 11315 (Part 12) – 1992: Quantitative Description of Discontinuities in Rock Mass – Methods – Part 12: Drill Core study.
20. IS: 12070 – 1987: Code of Practice for Design and Construction of Shallow Foundations on Rocks.
21. IS: 6403 – 1981: Code of Practice for determination of Bearing Capacity of Shallow Foundations.
22. IS: 8009 – 1976 (Part I): Code of Practice for calculation of settlements of Foundations.