GEO TECHNICAL INVESTIGATION REPORT

REPORT No.: **GT / 3145-2 / 2022-23**

PROJECT: **Proposed construction of (S+5 Floors) Building in 360 sq. yd. Plot at Yapral, Hyderabad**

CLIENT: **M/s Avisun Properties LLP**

W. O. Ref: **GT/QUO/Soil/2022-23/298 Dated: 1st February 2023**

DURATION: **February 2023**

GEOTECHNICAL CONSULTANTS:

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ISO 9001:2015 COMPANY

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1. INTRODUCTION

M/s Avisun Properties LLP have engaged M/s Geo Technologies as Consultant to carryout soil investigation work for the proposed construction of S+5 Building in 360 sq yds Plot at Yapral, Hyderabad.

Soil investigation was carried out by drilling one (1) bore hole.

The results of these investigations and recommendations are presented in this Report.

2. FIELD INVESTIGATIONS

DRILLING:

150 mm / NX size rotary core drilling was performed. The size of the casing used was 150 mm / 90 mm.

All the field operations were conducted as per IS: 1892.

The borehole was drilled at the location shown in the site plan (Fig.1).

Standard Penetration Tests (SPT):

Standard Penetration Tests were conducted in accordance with IS: 2131-1981, in soil and completely weathered rock (SDR) layers, and SPT samples were collected.

Field Bore Logs:

All the details collected from the field operations are recorded in Field Bore Log Chart (devised by combining the Record of Boring of IS: 1892 and Drilling Log of IS: 4464).The field bore log charts are given in Annexure-1.

Collection of soil samples

Split-spoon samples and disturbed soil samples were collected from boreholes at frequent intervals.

All the soil samples collected were properly packed, labeled and transported to Geo Technologies Soil Testing Laboratory at Hyderabad.

3. LABORATORY TESTING

The samples were tested at Soil Testing Laboratory of GEO TECHNOLOGIES at Hyderabad.

The following tests were performed on the Soil samples:

- Specific gravity (IS: 2720: part3 – 1980)
- Grain size distribution (IS 2720 part 4 – 1985)
- Unit weight (IS 2720 : 1974)
- Shear test (IS 2720 – part 13 – 1986)

No cores were recovered in SDR strata.

4. RESULTS

Fig. 2 gives the Log of bore hole.

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

Appendix gives the calculations for SBC for foundations.

Annexure-1 gives the Field Bore Log Chart.

5. SUB SOIL PROFILE

Based on the bore log data, the subsoil profile in the site is as follows:

BH No.	Depth, m	Strata	N value
BH-3	0.00 – 1.50	Silty gravel	–
	1.50 – 3.50	Chalky gravel	9 – 37
	3.50 – 6.00	Silty gravel	50
	6.00 – 8.00	Gravel / Gravel with clay	50
	8.00 – 12.00	Soft Disintegrated Rock (SDR)	> 50

At the time of drilling, water table was observed at 3.0 m depth in the bore hole. The site is situated close to Yapral Lake.

6. RECOMMENDATIONS

The following recommendations are made for the proposed construction of S+5 Building in 360 sq yds Plot at Yapral, Hyderabad. These are based on one (1) bore hole.

1) The subsoil profile in the site is as follows:

BH No.	Depth, m	Strata	N value
BH-3	0.00 – 1.50	Silty gravel	–
	1.50 – 3.50	Chalky gravel	9
	3.50 – 6.00	Silty gravel	37
	6.00 – 8.00	Gravel / Gravel with clay	50
	8.00 – 12.00	Soft Disintegrated Rock (SDR)	> 50

2) At the time of drilling, water table was observed at 3.0 m depth in the bore hole.
3) Open foundations are recommended.
4) Safe Bearing Capacity is recommended as follows:

Depth of foundation, m	Foundations resting in	Recommended SBC, t / m^2
2.5	Chalky gravel	15
3.0	Chalky gravel	20

5) All Foundations should be backfilled with well-compacted gravel.
6) As the site is situated close to Yapral Lake, seepage into the site will be there continuously. It may become severe during heavy rains. Shallow water table should be taken into account in designing foundations and grade slabs.
7) All concreting must be done in dry conditions.

For ***GEO TECHNOLOGIES***

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TABLE-1: Results of Lab testing of Soil samples

BH No.	Depth, m	Soil	Sp. Gr.	Grain size, Percentage			γ KN/ Cum	Direct Shear Test	
				Gr >4.75mm	Sa 4.75 to 0.075 mm	Fines (Si+Cl) <0.075 mm		C	Ø
BH-3	1.5	Chalky gravel	2.66	30	30	33	17.8	14	30
	3.0	Chalky gravel	-	43	22	35	18.4	12	33

Appendix: Calculation of SBC for Open foundations

I. Foundations resting in Silty gravel at 2.5 m depth

Assumed depth of foundation D = 2.0 m; (Effective) Assumed Width of foundation B = 2.0 m

Unit wt. r= 18.4 kN / m^3; Unit wt. r' = 8.2 kN / m^3; Cohesion = 12 kN / m^2 (Neglected) Φ = 31°.

Using IS Code 6403 -1981 formula for Isolated footings:

Nc = 33.34 Nq = 21.38 Nr = 27.52

Net ult B.C. = 1.3 c Nc + r' D (Nq - 1) + 0.4 r' B Nr = 539.87 kN/ m^2.

With a FS of 3, SBC = 179.96 kN / sq m

Recommended SBC for foundations resting in Chalky gravel at 2.5 m depth is 15 t / m^2.

II. Foundations resting in Chalky gravel at 3.0 m depth

Assumed depth of foundation D = 2.0 m (Effective);

Assumed Width of foundation B = 2.0 m

Unit wt. r= 18.4 kN / m^3; Unit wt. r' = 8.6 kN / m^3; Cohesion = 10 kN / m^2 (Neglected) Φ = 32°.

Using IS Code 6403 -1981 formula for Isolated footings:

Nc' = 39.72 Nq' = 27.34 Nr' = 37.70

Net ult B.C. = 1.3 c Nc + r' D (Nq - 1) + 0.4 r' B Nr = 712.42 kN/ sq m

With a FS of 3, SBC = 237.47 kN / sq m

Recommended SBC for foundations resting in Chalky gravel at 3 m depth is 20 t / m^2.

Annexure-1

FIELD BORE CHARTS