GEO TECHNICAL INVESTIGATION REPORT

REPORT No.: **GT / 1936-2 / 2021-22**

PROJECT: **Proposed Construction of (S+5 Floors) Building at Eshwaripuri Colony, Sainikpuri**

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

DURATION: **May 2021**

GEOTECHNICAL CONSULTANTS:

GEO TECHNOLOGIES

ISO 9001:2015 COMPANY

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CONTENTS

1. INTRODUCTION

M/s Avisun Properties LLP has engaged M/s Geo Technologies as Consultant to carryout soil investigation work for the proposed (S+5 Floors) building at Eshwaripuri Colony, Sainikpuri.

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

The results of this investigation and recommendations are presented in this Report. All the investigations are conducted in accordance with the relevant IS Codes.

2. FIELD INVESTIGATIONS

DRILLING:

The bore hole was drilled at the location specified by the client. Table-1 gives details of the bore hole drilled.

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 collected
- SPT results

STANDARD PENETRATION TEST (SPT):

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

FIELD BORE LOGS:

All the details collected from the field operations are presented in Logs of Bore holes in Annexure-1 at the end of this Report. These logs contain depth wise strata details, depth and type of samples collected and results of Standard Penetration Tests.

Collection of soil samples

Split-spoon samples and disturbed soil samples were collected from borehole 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 the Soil Testing Laboratory of M/s GEO TECHNOLOGIES at Hyderabad.

The following tests were performed on the Soil samples from the borehole:

- Natural Moisture Content
- Atterberg Limits (LL, PL, PI, SL)
- Grain size analysis
- In situ Dry Density
- Shear test

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

4. RESULTS

Fig. 1 gives the combined Log of bore hole.

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

Appendix gives the calculations for SBC for foundations.

5. SUB-SOIL PROFILE

Based on the single Bore log, the subsoil profile in the site is as follows:

Depth, m	Strata	N value
0.00 – 3.00	Silty sand	16
3.00 – 4.00	Clayey Sand with gravel	21
4.00 – 4.30	Boulder	-
4.30 – 6.00	Clayey Sand with gravel	50
6.00 – 9.00	Silty sand	50
9.00 – 10.00	SDR	>50

The Site is located beside Kapra Lake. Water table is seen in boreholes at a depth of 7.2 m at the time of drilling.

Considering the loose / soft soil conditions, open foundations (combined / strip) are recommended.

6. RECOMMENDATIONS

The following recommendations are made for the proposed Construction of S+5 building at Eshwaripuri Colony, Kapra. These are based on core drilling of one (1) borehole.

a) The sub-soil profile in the site is quite non-uniform depth-wise, as detailed in the previous section.

b) The site is situated close to a Lake. At the time of drilling, water table is seen in the borehole at a depth of 7.2 m.

c) It is given to understand that the proposed building comprises of S+5 upper floors.

d) The soil up to 9.0 m is soft, comprising silty sand / clayey sand.

e) Open foundations (Combined or strip footings) are recommended.

f) SBC for foundations is recommended as follows:

Foundation depth, m	Foundations resting in	SBC, t/ sq m
3.0	Clayey sand with gravel	15 with sand bed
4.5	Clayey sand with gravel	20 with sand bed

g) Foundations should be backfilled with well-compacted gravelly morum. The excavated soil from the site is not suitable for this purpose.

h) Due to Presence of Lake adjacent to the site and possible rise of water level during rainy season, care should be taken against seepage of water into foundations.

For ***GEO TECHNOLOGIES***

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Name of Work: Proposed Construction of S+5 Building at Eashwaripuri colony, Kapra

TABLE – 1: RESULTS OF LAB TESTS ON SOIL SAMPLES

S. No.	BH No.	Depth, m	Soil	M.C.	γ_b	Grain Size, %			Shear Parameters	
						Gr	Sa	Si+Cl	C	Φ deg
1	BH-1	1.5	Silty Sand	1.7	18.0	0	63	37	10	28
2		3.0	Clayey sand with gravel	2.4	18.1	10	54	36	20	28
3		4.5	Clayey sand with gravel	2.2	-	11	56	33	22	30

NOTATION : MC: Moisture Content; Gr … Gravel Sa … Sand Si … Silt Cl… Clay
γ_b : Insitu density C: Cohesion kN/m^2 ; UCC: Unconfined Compressive Strength kN/m^2

Name of Work: Proposed Construction of S+5 Building at Eashwaripuri colony, Kapra

APPENDIX: TYPICAL CALCULATION OF SBC

Open (Combined / Strip) Foundations in Clayey sand with gravel:

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

Assumed width of foundation B = 2.0 m

γ = 18.1 KN/m^3; c = 20 KN/m^2; c' = 13.4 KN/m^2; $\phi = 28^o$.

Nc' = 14.2 Nq' = 6.45 Nr' = 5.50

Net, Ult B.C. = 1.3 c' Nc' + r D (Nq' – 1) + 0.4 r B Nr' = 5249 KN per sq m

With a F.S. of 3.0, SBC = 174 KN per sq m

Recommended Safe Bearing Capacity is 15 t per sq m

Sand bed is recommended.

ANNEXURE - 1

FIELD BORE LOGS