



GEO TECHNICAL INVESTIGATION REPORT

REPORT No.: **GT / 1936-3 / 2021-22**

PROJECT: **Proposed Construction of (S+5 Floors) Building at
Dhruva Enclave, Registration Colony, Jawahar Nagar,
Yapral**

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

DURATION: **May 2021**

GEOTECHNICAL
CONSULTANTS:

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ISO 9001:2015 COMPANY

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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 Dhruva Enclave, Registration Colony, Jawahar Nagar, Yaprak.

Soil investigation was carried out by drilling two (2) bore holes.

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 boreholes were drilled at the locations shown in the site plan.

Standard Penetration Tests (SPT):

Standard Penetration Tests were conducted in accordance with IS: 2131-1981, in soil and 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 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 Soil Testing Laboratory of GEO TECHNOLOGIES at Hyderabad.

As the soil in the site is essentially coarse grained and cohesionless, the following tests were performed on the Soil samples:

- Specific gravity
- Grain size distribution
- Unit weight
- Direct Shear test

All the tests were conducted in accordance with IS Code: 2720 (various parts).

4. RESULTS

Fig. 1 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 Charts.

5. SUB SOIL PROFILE

Based on the two bore logs, the subsoil profile in the site can be generalized as follows:

Depth, m	Strata	N value
0.00 – 3.00	Silty clay / Silty sand / Silty gravel / Clayey Gravel	16 – 18
3.00 – 6.00	Gravel	44 – 50
6.00 – 10.00	SDR	>50

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

6. RECOMMENDATIONS

The following recommendations are made for the proposed (S+5 Floors) building at Dhruva Enclave, Registration Colony, Jawahar Nagar, Yaprul. These are based on two (2) boreholes only.

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

Depth, m	Strata	N value
0.00 – 3.00	Silty clay / Silty sand / Silty gravel / Clayey Gravel	16 – 18
3.00 – 6.00	Gravel	44 – 50
6.00 – 10.00	SDR	>50

2) At the time of drilling, no water table was observed in the boreholes.

3) Based on soil conditions, Open foundations are recommended.

4) Safe Bearing Capacity is recommended as follows:

Depth of foundation below EGL, m	Foundations resting in	SBC, t / sq m
2.0	Silty gravel / Clayey gravel	20
3.0	Gravel	30

5) This is based on the assumption of footings of width 2 m. The actual shape and size would be based on loads from the super structure.

6) Foundations should be backfilled with well-compacted gravelly morum.

7) These recommendations are based on two boreholes only. In other locations, the soil conditions may be different, and hence all the foundation pits should be carefully examined by the structural designer to confirm SBC.

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	ϕ
BH-1	1.5	Silty gravel	2.67	41	29	30	18.4	11	30
	3.0	Gravel	2.68	55	30	15	-	10	33
BH-2	1.5	Clayey gravel	2.66	44	21	35	18.2	14	30
	3.0	Gravel	-	58	26	16	18.7	10	33

Appendix: Calculation of SBC for Open foundations

Foundations at 2.0 m depth:

Assumed depth of foundation $D = 2.0$ m;

Assumed Width of foundation $B = 2.0$ m

Unit wt. $r = 18.4$ kN / cu m; Cohesion = 11 kN / sq m (Neglected); $\Phi = 30$ degrees

Using IS Code 6403 -1981 formula for Isolated footings:

$$Nc' = 23.15 \quad Nq' = 12.75 \quad Nr' = 14.52$$

$$\text{Net ult B.C.} = 1.3 c' Nc' + r D (Nq' - 1) + 0.4 r B Nr' = 646 \text{ kN/ sq m}$$

$$\text{With a FS of 3, SBC} = 215 \text{ kN / sq m}$$

Recommended SBC for foundations resting at 2.0 m depth is 20 tonnes per sq m.

Foundations at 3.0 m depth:

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

Assumed Width of foundation $B = 2.0$ m

Unit wt. $r = 18.7$ kN / cu m; Cohesion = 10 kN / sq m (Neglected); $\Phi = 33$ degrees

Using IS Code 6403 -1981 formula for Isolated footings:

$$Nc' = 29.37 \quad Nq' = 18.39 \quad Nr' = 23.55$$

$$\text{Net ult B.C.} = 1.3 c' Nc' + r D (Nq' - 1) + 0.4 r B Nr' = 981 \text{ kN/ sq m}$$

$$\text{With a FS of 3, SBC} = 327 \text{ kN / sq m}$$

Recommended SBC for foundations resting at 3.0 m depth is 30 tonnes per sq m.



Annexure-1

FIELD BORE CHARTS