

**GEO-TECHNICAL INVESTIGATIONS REPORT FOR ARMY COLLEGE OF DENTAL
SCIENCE SECUNDRABAD MADCHEL- MALKAJGIRI –HYDERABAD-TELAGANA STATE.**

APRIL 02th, 2025



CLIENT : ARMY COLLEGE OF DENTAL SCIENCE-SECUNDRABAD

**PROJECT CONSULTANTS: M/S SATYAVANI PROJECTS&CONSULTANTS
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1. PROJECT DETAILS

1.1 The Site

1.1.1 FOR PROPOSED CONSTRUCTION OF TWO STORIED BUILDING
AT ACDS - Gabbilalpet Main Rd, Rajiv Swagruha ABHIMAAN Project,

1.1.2 The weather was clear and dry during field investigations, which were carried out between 01/04/2025

1.2 Seismic Zone

1.2.1 The proposed project site is situated near Secundrabad which falls under Seismic Zone II as per IS 1893 (Part I) - 2002.

2.0 SCOPE OF INVESTIGATIONS

2.1 In order to achieve the above objectives, the scope of investigations given by the client includes the following:

- a) Collection of Disturbed and Undisturbed soil samples
- b) Conducting relevant laboratory tests on soil samples .
- e) Preparation and submission of a technical report containing the details of the tests carried out their analysis

3.0 FIELD INVESTIGATIONS

Ground Water Table: Observation of ground water table is important since it influences the bearing capacity of soil in different seasons.

TRAIL PIT NO	EXCAVATED DEPTH	WATER TABLE FROM G.L.IN M
PIT-1	1.20M	NOT MET
PIT-2	1.20M	NOT MET
PIT-3	1.20M	NOT MET

4.0 LABORATORY INVESTIGATIONS

6.1 The soil samples brought to the laboratory were tested to evaluate the following properties

- a) Type of soil and its gradation
- b) Specific gravity
- c) Consistency limits
- d) Natural density
- e) Natural water content
- f) Shear strength properties

5.0 RESULTS OF INVESTIGATIONS

5.1. The results of field investigations and laboratory tests conducted on the soil Samples..

5.2 The soil profile tables indicate the following:

- c) Direct Shear test results

6.0 ANALYSIS OF RESULTS

6.1 Subsoil Profile

Pit-1-----Stratum I : Hard murraum up to depth—1.20m

Pit-2-----Stratum I : Hard murraum up to depth- 1.20m

Pit-3-----Stratum I : Hard murraum up to depth- 1.20m

7. Design methodology

The safe bearing capacity of the soil can be calculated on shear failure criteria. The shear strength and bearing capacity equation suggested by IS 6403 as follows the net bearing capacity

is given by

Safe bearing capacity (under submerged conditions)

$$q_s = 1/3 [2/3 C N_c s_c d_c i_c + \gamma_b D_f (N_q - 1) S_q d_q i_q + 0.5 \gamma_b B N_\gamma S_\gamma d_\gamma i_\gamma W]$$

8.FOUNDATION RECOMMENDATIONS:-

Based on the sub soil conditions and possible loads on foundations following recommendations for geotechnical investigation for the proposed construction of building in Army College of Dental Science- Gabbilalpet Main Rd, Rajiv Swagraha ABHIMAAN Project,

9.RECOMMENDATIONS

1.The isolated footing will be recommended for the proposed structure.

2. Open foundation

3.The recommended SBC of 27t/m² at 1.20m depth and allowable settlement is 25mm

Its calculated based on shear strength Parameters.

We observed soil strata is Hard Murrum,so that Excavate the soil from

0.00m to 1.20 meter depth

		CALCULATION OF SBC BASED ON SHEAR FAILURE BASED ON DISTURBED SOIL SAMPLES																						
		DS		TYPE OF FOUNDATION=ISOLATED FOOTING/COMBIND FOOTING										Water table correction=0.5										
Samples	Depth of Foundation, cm	Length of Bund, Cm	Width of Footing, cm	submerged Density of Soil/g/cc	Cohesion c, kg/cm ²	Angle of Shearing Resistance ϕ°	Bearing Capacity Factors			Depth Factors			Shape Factors				inclination factors	Bearing Capacity	Bearing Capacity	Bearing Capacity	Total Bearing Capacity	Net Safe Bearing Capacity	Net Safe Bearing Capacity	
							N _c	N _q	N _{\gamma}	d _c	d _q	d _{\gamma}	s _c	s _q	s _{\gamma}	i _c								i _q
NO	D	L	B	\gamma _b	C'	\phi'	N _c	N _q	N _{\gamma}	d _c	d _q	d _{\gamma}	s _c	s _q	s _{\gamma}	i _c	i _q	i _{\gamma}	B ₁	B ₂	B ₃	2 cm/kg	2 cm/kg	t/m ²
DS-1	150	200	200	0.001	0	34	42.9	31.81	45.47	1.15	1.14	1.14	1	1.2	1	1	1	1	0	6.32	1.819	8.14	2.71	27.1336
DS-2	150	200	200	0.001	0	35	46.1	33.3	48.03	1.15	1.14	1.14	1	1.2	1	1	1	1	0	6.63	1.921	8.55	2.85	28.4944
DS-3	150	200	200	0.001	0	35	46.1	33.3	48.03	1.15	1.14	1.14	1	1.2	1	1	1	1	0	6.63	1.921	8.55	2.85	28.4944

10. Summary of soil prosperities

Trail pit	sample	depth(M)	level of Water Table	Sample Description	Grain size analysis													
					Bulk Density/gm/cc	Dry Density/gm/cc	Specific Gravity	Moisture Content	Atter limits			IS Classification	Grain size					
									void ratio	LL%	PL%		PI%	gravel (>4.75mm)	Coarse Sand (4.75mm-2mm)	Medium Sand (2mm-0.425mm)	Fine Sand (0.425mm-0.075mm)	Silt/Clay (<0.075mm)
collectionpit	DS-01	1.2	notmet	Hard murrum	2.26	1.91	2.62	14.88%	0.423	NP	NP	NP	graded gravel	37.4	32.6	23.8	4.4	1.8
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LIST OF IS CODES

LABORATORY TESTS

1. IS 2720 (Part 1) - 1983 : Preparation of soil samples
2. IS 2720 (Part 2) - 1973 : Determination of water content
3. IS 2720 (Part 4) - 1985 : Grain Size Analysis
4. IS 2720 (Part 5) - 1985 : Atterberg Limits
5. IS 2720 (Part 11) - 1973 : Determination of shear Strength parameters using Direct shear apparatus.

FIELD INVESTIGATIONS

1. IS 1498 : 1970 : Classification and Identification of soils for general engineering purposes.
2. IS 1892 : 1979 : Code of practice for sub surface investigations for foundations
3. IS 2131 : 1981 : Method of standard penetration test for soils.
4. IS 2132 : 1986 : Code of practice for thin walled tube sampling of soil.