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DEPARTMENT OF TECHNICAL EDUCATION
GOVERNMENT COLLEGE OF ENGINEERING,
DHARMAPURI – 636704.

REPORT NO: GCE/CIVIL-SOIL/C- 83/2024 dated: 21.05.2024

PROJECT: PROPOSED CONSTRUCTION OF NEW RESIDENTIAL BUILDING(Stilt+5) AT SF NO.200/B Part, T.S No:24/1A,Block-17,WARD-C,HOSUR TOWN,HOSUR CITY MUNICIPAL CORPORATION AND TALUK,KRISHNAGIRI DISTRICT

TITLE: BOREHOLE SOIL INVESTIGATION FOR CONSTRUCTION OF Stilt+5 RESIDENTIAL BUILDING AT HOSUR TOWN,HOSUR CITY MUNICIPAL CORPORATION AND TALUK,KRISHNAGIRI DISTRICT.

CLIENT: M/S CITY GARDEN PROMOTERS
1.MR.N.NALLAPAN,S/O MR.NACHIAPPAN
2.MR.K.RAVIKUMAR S/O MR.T.KANNIAPPPAN
D.NO.1227,18TH MAIN ROAD
KAMBAR COLONY
ANNANAGAR WEST
CHENNAI-600040

DEPARTMENT OF CIVIL ENGINEERING

GCE, DHARMAPURI

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REPORT ON BOREHOLE SOIL INVESTIGATION REPORT FOR THE PROPOSED CONSTRUCTION OF NEW RESIDENTIAL BUILDING (Stilt+5) AT SF NO.200/B PART, T.S NO:24 /1A,BLOCK-17, WARD-C, HOSUR TOWN, HOSUR CITY MUNICIPAL CORPORATION AND TALUK, KRISHNAGIRI DISTRICT

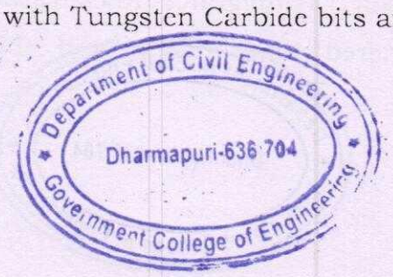
GENERAL:

M/S City Garden Promoters, in their letter sent on, dated: 06.05.2024, requested for borehole soil investigation for the proposed construction of new residential building (Stilt+5) at SF No.200/B Part, T.S No:24 /1A,Block-17, Ward-C, Hosur town, Hosur City Municipal Corporation and Taluk, Krishnagiri District. The borehole soil investigation was carried out during May 2024 through YUBE Prime Infra, Suramangalam Post, Salem-5 under the supervision of the Department of Civil Engineering, Government College of Engineering, Dharmapuri. Based on client's request, it was decided to explore the subsurface by drilling 2 boreholes covering the proposed area of construction. The scope of work includes drilling of 2 boreholes up to depth of 10m with SPT and DS sampling at every 1.0m. The details required to decide on the depth of foundation, type of foundation and the foundation design parameters are to be obtained from the borehole data.

1.0 FIELD INVESTIGATION:

It was decided to make a total of 2 numbers of Boreholes based on client's request. The 2 boreholes BH01 and BH02 of diameter 150mm were investigated upto a depth of 10m. Boreholes were advanced from the existing ground level using rotary drilling technique supplemented with bentonite mud circulation.

Standard Penetration Tests (SPT) was conducted at every 1.0m and at every change of strata. N – value is defined as the number of blows required for the penetration of a Split Spoon Sampler for the last two 15cm penetrations. Coring was done in hard formations using Nx size coring tools fitted with Tungsten Carbide bits and diamond drill bits.



Standard Penetration Test which is universally known as SPT was conducted at the desired levels. N value is the output of SPT. N value is defined as the number of blows required for the penetration of a Split Spoon Sampler for the last two 15cm penetrations. It indicates the relative density of sand or gravel and the consistency of other soils such as silts or clays. The test was carried out as per IS 2131 – 1981.

The split spoon sampler is attached to drill rod and lowered to the bottom of the bore hole. A standard blow consists of dropping a mass of 63.5kg at a free fall of 750mm on to an anvil at the top of the rods was given and ensuring that this amount of dynamic energy is transferred to the sampler as much as possible.

The number of blows required to achieve each 150mm penetration is recorded until a total penetration of 450mm is achieved. The initial 150mm penetration is referred to as seating drive and the blows required for this penetration are not considered as soil in this zone is in disturbed condition. The next 300mm of penetration is referred to as the test drive and the number of blows required to achieve this fully is termed as penetration resistance or N-value.

2.0 LABORATORY INVESTIGATION:

The soil samples obtained using Split Spoon Sampler and core recoveries were analysed in the Geotechnical Engineering laboratory for its classification and the results are shown in the borehole logs as given in Fig 1 and Fig 2.

3.0 SOIL PROFILE:

BH01:

The soil profile consists of filled up soil at the top for a thickness of 1.00 m followed by Poorly Graded Sand (SP) up to a depth of 4.0 m which is underlain by Soft Disintegrated Rock (SDR) upto 7m and then by Completely Weathered Rock (CWR) and then by highly weathered

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rock(HWR) up to the depth of exploration of 10.0m. The core recovery ranges from 10% to 50% and RQD value ranges from 17% to 50%.

BH02

The soil profile consists of filled up soil at the top for a thickness of 1.0 m followed by Poorly Graded Sand (SP) upto a depth of 3.0 m which is underlain by Soft Disintegrated Rock (SDR) for a thickness of 1m and continued by completely weathered rock(CWR) and Highly weathered rock(HWR) upto the depth of exploration of 10.0 m. Core recovery value from 13% to 32% and RQD value is 32%.

GROUND WATER TABLE:

Ground Water table was not met during bore hole investigation from ground level. But Water table reduction factors are taken into consideration in calculating the allowable bearing capacity of soil.

4.0 ALLOWABLE BEARING CAPACITY AT THE PROPOSED DEPTH OF FOUNDATION:

The safe bearing capacity of soil can be calculated on shear failure criteria and settlement criteria and any foundation system has to satisfy the following criteria.

4.1. *BEARING PRESSURE CORRESPONDING TO SHEAR FAILURE:*

The net ultimate bearing capacity, q. (in kN/m^2) is given by

$$q_{nu} = 0.314N^2 B. Rw_2 + 0.943 (100 + N^2) Df. Rw_1$$

Where,

N : SPT value
D_f : Depth of foundation in m
B : Minimum size of the foundation (taken as 2.0m)
R_1 & R_2 : Water table correction factors (for the worst case, taken as 0.5)

$$q_{nu} = 0.314 \times 50^2 \times 2 \times 0.5 + 0.943 (100 + 50^2) 2.5 \times 0.5$$

q_s = 1242.39kN/m² with factor of safety 3.



4.2. *BEARING PRESSURE CORRESPONDING TO SETTLEMENT CONSIDERATION :*

The safe bearing pressure, q_s, (in kN/m^2) corresponding to a settlement of 25mm is given by

$$q = 1.36\,(N-3)\left(\frac{B+0.3}{2B}\right)^2 S.Rd.\ Rw_1$$

Where,

B: Maximum size of the footing (taken as 2.00m)

R: Water table correction factor (For the worst case, taken as 0.5)

$$q = 1.36(50-3)\left(\frac{2+0.3}{2\times 2}\right)^2 0.5 \times 25 \times 1.2$$

$$q_s = 317\ kN/m^2$$

5.0 SAFE BEARING CAPACITY

The recommended safe bearing capacity at various depths based on SPT results are tabulated in the Borehole log sheets.

Note

Any deviation if observed during execution other than that available as per bore log may be brought to the notice for further suggestions.

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BOREHOLE LOG - Fig 2

PROJECT: PROPOSED CONSTRUCTION OF NEW COMMERCIAL BUILDING (G+5) AT SF.NO. 200/B Part, T.S NO: 24/1A, BLOCK - 17, WARD - C, HOSUR TOWN, HOSUR CITY MUNICIPAL CORPORATION AND TALUK, KRISHNAGIRI DISTRICT.

SITE : HOSUR CITY MUNICIPAL CORPORATION KRISHNAGIRI DISTRICT.

B.H.No. : 02

DIA & TYPE OF BORING : 150mm Rotary boring with drilling mud circulation

DIA OF BORING : 150mm

GROUND WATER TABLE : NIL

PROJECT NO : 01

DATE OF START : 16 - 05 - 2024

DATE OF FINISH : 17 - 05 - 2024

BIS	R.L.	Log of BH	Depth (m)	N	Penetration Resistance (0 10 20 30 40 50 60)	SBC kN/m²	Core Recovery %	RQD %	Compressive Strength N/mm2	Remarks
Filled up soil			1m	28			NIL	NIL	NIL	
Poorly graded sand (SP)			2m	>50			NIL	NIL	NIL	
			3m	>50			NIL	NIL	NIL	
Soft Disintegrated Rock (SDR)			4m	>50		250	NIL	NIL	NIL	
Completely Weathered Rock (CWR)			5m			260	22	NIL	NIL	
			6m			280	13	NIL	NIL	
			7m				13	NIL	NIL	
			8m				29	NIL	NIL	
			9m				15	NIL	NIL	
Highly Weathered Rock (HWR)			10m				32	32	NIL	

Bore hole terminated at 10m from ground level

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BOREHOLE LOG - Fig 1

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SITE : HOSUR CITY MUNICIPAL CORPORATION KRISHNAGIRI DISTRICT.

B.H.No. : 01

DIA & TYPE OF BORING : 150mm Rotary boring with drilling mud circulation

DIA OF BORING : 150mm

GROUND WATER TABLE : NIL

PROJECT NO : 01

DATE OF START : 14 - 05 - 2024

DATE OF FINISH : 15 - 05 - 2024

BIS	R.L.	Log of BH	Depth (m)	N	Penetration Resistance (0 10 20 30 40 50 60)	SBC kN/m²	Core Recovery %	RQD %	Compressive Strength N/mm2	Remarks
Filled up soil			1m	24			NIL	NIL	NIL	
Poorly graded sand (SP)			2m	>50			NIL	NIL	NIL	
			3m	>50			NIL	NIL	NIL	
			4m	>50		200	NIL	NIL	NIL	
Soft Disintegrated Rock (SDR)			5m			220	NIL	NIL	NIL	
			6m			250	NIL	NIL	NIL	
			7m				NIL	NIL	NIL	
Completely Weathered Rock (CWR)			8m				10	NIL	NIL	
Highly Weathered Rock (HWR)			9m				17	17	NIL	
			10m				50	50	NIL	

Bore hole terminated at 10m from ground level

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