SUBSOIL INVESTIGATION REPORT

FOR THE CONSTRUCTION OF 5 MLD WATER TRETAMENT PLANT AT ERATTAYAR TO PROVIDE FHTCS TOM ALL HOUSE HOLDS TO ERATAYAR AND KAMAKSHI G P UNDER JALAJEEVAN MISSION

AL-AMEEN
ENGINEERING COLLEGE

GEOTECHNICAL ENGINEERING LABORATORY

CIVIL ENGINEERING DEPARTMENT

AL-AMEEN ENGINEERING COLLEGE,
KULAPPULLY P.O, SHORNUR – 2, PALAKKAD

October-22

'95

DEPARTMENT OF CIVIL ENGINEERING

SUB SOIL INVESTIGATION REPORT

Name of client	: **Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura. Ernakulam Dist.**
Site of investigation	: Three bore in Erattayar Panchayaths.
Period of investigation	: 26-9-22 TO 27-9-22
Ref: No.	: AL-AM/GE/0285/22 Dated 7-10-22
Laboratory	: AL-Ameen Engineering College, Kulappully.P.O.
Analysis done by	: Prof. K.Murari

7/10/22

Prof: K.MURARI.M.Tech

Consultant
Al-Ameen Engineering College.
CHARTED ENGINEER (FIE 16619/03)
(Retired Professor, Civil Dept.
N.S.S. College of Engineering, Palakkad.)

DEPARTMENT OF CIVIL ENGINEERING
Al-Ameen Engineering College, Kulappully

Date: **7-10-2022**

Prof. MURARI. K, M.Tech.
CONSULTANT
DEPARTMENT OF CIVIL ENGINEERING
AL-AMEEN ENGINEERING COLLEGE
KULAPPULLY P.O., SHORANUR - 2.

FOR THE CONSTRUCTION OF 5 MLD WATER TRETAMENT PLANT AT ERATTAYAR TO PROVIDE FHTCS TOM ALL HOUSE HOLDS TO ERATTAYAR AND KAMAKSHI G P UNDER JALAJEEVAN MISSION

Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura. Ernakulam Dist, as per letter dated 27-9-22, requested to The Principal, AL-Ameen Engineering College, for arranging the analysis and preparation of investigation report of the Erattayar site. The Principal, AL-Ameen Engineering College authorized to take up the consultancy work by Prof. Murari.K, the consultant of the college.

INVESTIGATION

Shri. Sajeev C. George, C5 , Good Earth haveli, Thripunithura, conducted the deep soil investigation at three locations for the Jalajeevan Mission Project. Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura, supplied the soil samples and the bore logs of three bores to the Geotechnical Engineering laboratory of this institution. The soil samples are matching with the bore logs supplied.

OBSERVATION

It is proposed to construct a water treatment plant of capacity 5 MLD at this location.

In bore -1 - it is seen that the top soil is filled black soil up to a depth of 0.80 m below ground level. From 0.80 m depth there is fair quality hard rock exists. The bore log is shown in fig-2.

In bore -2 - the top soil is filled black soil up to a depth of 2.20 m below ground level. The second layer is loose lateritic soil of 1.80 m thick. The third layer is lateritic soil of 1.20 m thick. From 5.20 m depth there is soft rock of 2.65 m thick exists. Below the soft rock fair quality hard rock exists at 7.85m deep from GL. The bore log is shown in fig-3.

In bore -3 - the top soil is filled black soil up to a depth of 1.75 m below ground level. The second layer is soft rock of 2.05 m thick exists. Below the soft rock fair quality hard rock exists at 3.80 m deep from GL. The bore log is shown in fig-4.

From the bore log and the test results it is seen that the soil strata changes in the three bore locations. Hence the recommended soil parameters are shown in Table-1, II & III for the bore-1, 2 &3 respectively. The recommended Safe Bearing Capacity (SBC) for different soil strata at different depths are also shown in the tables for here boreholes.

RECOMMENDATIONS

From the bore log and the soil properties, it is recommended to provide isolated shallow footing on the rock strata available at shallow depth at the site. In bore-1, rock is available at depth of 0.80 m and in bore -3; rock is available at depth of 1.75 m belowground level at this location. In bore-2, rock is available at depth of 5.20 m only. Hence for foundations similar to bore-2 locations end bearing short piles anchored to hard rock may be used to support the columns.

TABLE-1

Soil Properties	Bore- I
	Depth(m)
	0.80
Bulk density (g/cc)	--
Cohesion (C) (kg/cm^2)	--
Angle of internal Friction (ϕ)	--
Safe Bearing Capacity of rock (SBC) (T/m^2)	755

TABLE-1I

Soil Properties	BH No-II					
	Depth(m)					
	1	2	3	4.5	5.2	
Bulk density (g/cc)	1.61	1.64	1.74	1.92		
Cohesion (C) (kg/cm^2)	0.05	0.06	0.10	0.20		
Angle of internal Friction (ϕ)	18	18	22	26		
Safe Bearing Capacity (SBC)(T/m^2)	5	8	12	25	40	
Safe Bearing Capacity of rock (T/m^2)						730

TABLE-1II

Soil Properties	BH No-III			
	Depth(m)			
	1	1.75		
Bulk density (g/cc)	1.93			
Cohesion (C) (kg/cm^2)	0.08			
Angle of internal Friction (ϕ)	20			
Safe Bearing Capacity (SBC)(T/m^2)	10	40		
Safe Bearing Capacity of rock (T/m^2)				720

BORE LOCATIONS AT ERATTAYAR SITE FOR 5 MLD WTP

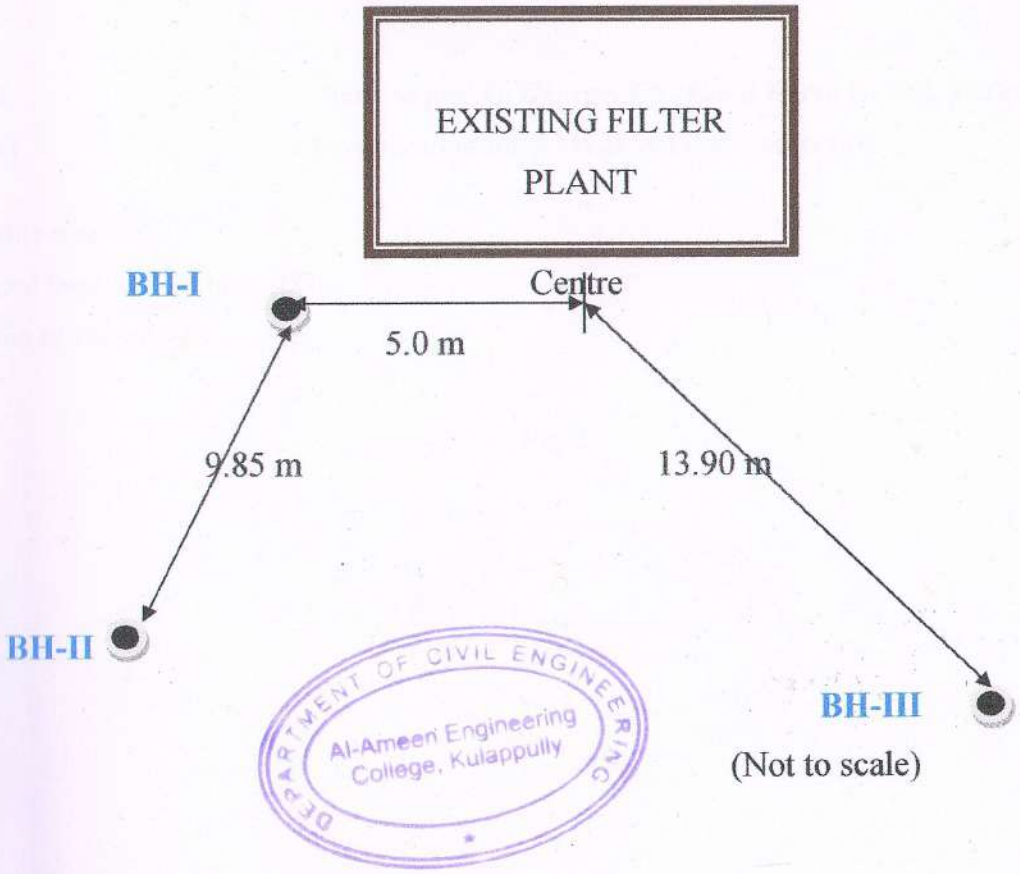

Fig-1

AL AMEEN ENGINEERING COLLEGE, KULAPPULLY

GEOTECHNICAL ENGINEERING LABORATORY

Type of boring: Rotary drilling — Bore loge and data sheet 1/3

Date of commence: 26-9-22 — Date of completion: 26-9-22

Depth in m below G/L	Soil Profile	Visual description of soil	Thickness of layer	Standard Penetration test		Graph of N Value						Remarks
				Depth in m	'N' Value	10	20	30	40	50	>50	
0.00 0.80		Filled soil (Black)	0.80	0.80	SPT REBOUND W/O SAMPLE							
1.80		Hard Rock	1.00		Boring with D/C Bit							RQD=65% (Fair)
Borehole terminated at 1.80 m in hard Rock												

Client : **Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura**

Project : **Investigation for 5 MLD WTP at Erattayar**

Borehole number : **1**

Reduced level of bore hole at GL : ---

Position of water table : --

Fig-2

AL AMEEN ENGINEERING COLLEGE, KULAPPULLY

GEOTECHNICAL ENGINEERING LABORATORY

Type of boring: Rotary drilling — Bore loge and data sheet 2/3

Date of commence: 26-9-22 — Date of completion: 26-9-22

Depth in m below G/L	Soil Profile	Visual description of soil	Thickness of layer	Standard Penetration test: Depth in m	Standard Penetration test: 'N' Value	Graph of N Value	Remarks
0.00		Filled soil (Black)	2.20	1.0	3		
2.20				2.0	5		
		Lateritic soil Soft (Red)	1.80	3.0	7		
4.00							
		Lateritic soil	1.20	4.5	15		
5.20				**5.20**		**SPT REBOUND W/O SAMPLE**	
		Soft Rock	2.65			**Boring with D/C Bit**	
7.85				**7.85**			
		Hard Rock	1.00				**RQD=67% (Fair)**
8.85							
Borehole terminated at 8.85 m in hard Rock							

Graph of N Value: 10 20 30 40 50 >50

Client : **Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura**

Project : **Investigation for 5 MLD WTP at Erattayar**

Borehole number : **2**

Reduced level of bore hole at GL : ---

Position of water table : --

Fig-3

AL AMEEN ENGINEERING COLLEGE, KULAPPULLY

GEOTECHNICAL ENGINEERING LABORATORY

Type of boring: Rotary drilling — Bore loge and data sheet 3/3

Date of commence: 27-9-22 — Date of completion: 27-9-22

Depth in m below G/L	Soil Profile	Visual description of soil	Thickness of layer	Standard Penetration test		Graph of N Value						Remarks
				Depth in m	'N' Value	10	20	30	40	50	>50	
0.00		Filled soil (Black)	1.75	1.00	7							
1.75		Soft Rock	2.05	1.75	SPT REBOUND W/O SAMPLE							
3.80		Hard Rock	1.00	3.80	Boring with D/C Bit							RQD=69% (Fair)
4.80												
Borehole terminated at 4.80 m in hard Rock												

Client : **Shri. Sajeev C. George, C5 , Good Earth Haveli, Thripunithura**

Project : **Investigation for 5 MLD WTP at Erattayar**

Borehole number : **3**

Reduced level of bore hole at GL : ---

Position of water table : --

Fig-4

Note

The recommendations are based on soil conditions as revealed at the points indicated in the site plan, and depths to which bore holes are taken. Any change or difference observed at other points or depths during construction should be closely monitored and changes in design / construction methods should be made if necessary. Any clarifications may be made within six months from the date of this report

Yours faithfully

DEPARTMENT OF CIVIL ENGINEERING
Al-Ameen Engineering College, Kulappully

7/10/22

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