REPORT ON

GEOTECHNICAL INVESTIGATION FOR A MULTI STORIED BUILDING DAG NO. 610, KHATIYAN NO. 959/1745, J.L. NO. 47, MOUZA BARHANS FARTABAD, HOLDING NO. 87, PASCHIM MAHAMAYAPUR, WARD NO. 28, UNDER RAJPUR-SONARPUR MUNICIPALITY.

CLIENT: SRI PARTHA PRATIM GANGOPADHAYAY & OTHERS

Prantika, Fartabad,

Garia, Kolkata-700084.

GEOTECHNICAL INVESTIGATION BY:

ABCON

8/103, BEJOYGARH, JADAVPUR,
KOLKATA - 700032.
PHONE: (0)9883179050.

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

- Soil Investigator
- Civil Engineers

9883179050
9836611978

Ref.: ABCON/RSM/018/2018-2019

Date: 04-10-2019

To,

Sri Partha Pratim Gangopadhayay & Others,
Prantika, Fartabad,
Garia, Kolkata-700084,

Dear Sirs,

SUB: REPORT ON SOIL INVESTIGATION FOR A MULTI STORIED BUILDING AT HOLDING NO. 87, PASCHIM MAHAMAYAPUR, WARD NO. 28, R. S. DAG NO. 610, R. S. KHATIYAN NO. 959/1745, J. L. NO. 47, MOUZA – BARHANS FARTABAD, UNDER - RAJPUR SONARPUR MUNICIPALITY.

We are pleased to submit herewith the detailed Soil Investigation Report on the said job in two copies.

This report contains the details of field work carried out, results of the field and laboratory tests along with recommendation for design of foundations for the proposed building.

Should have any queries about this report you may feel to refer the same to us.

Thanking you,

Yours faithfully,

(BIVASH RAY)

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

ABCON

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

CONTENTS

ABBREVIATION AND NOTATIONS

CHAPTER: I

Introduction

INTRODUCTION

110 GENERAL

It has been proposed that a soil investigation work will be done for the Multi-Storied Building. Sub soil investigation which is a two fold investigation namely field investigation and laboratory testing was carried out during the month of August 2018. The report presents the data in respect of the sub soil from the said building location Holding No. 87, Paschim Mahamayapur, Ward No. 28, Under Rajpur-Sonarpur Municipality. In respect of their Engineering and Physical required for the engineer in making the choice and design of foundation.

120 SCOPE OF WORKS

Client has put forward the scope of the present investigation, which include the following works:

a) Perform soil boring at two pre-determined locations, conducting standard penetration tests and collection of Disturbed / Undisturbed samples from cohesive deposits.

b) Laboratory tests on soil samples for classification purpose and to determine their strength and other Engineering properties.

c) Perform Engineering analysis to determine safe bearing capacity of suitable foundations, and evaluate other soil parameters to accomplish the purpose of designing suitable foundations for the proposed structure.

d) Preparation and submission of two copies report which will include the results of our study, analysis, recommendation of suitable parameters, necessary graphs, sketch drawings etc.

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

ABCON

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

e) Two holes were sunk the location as shown in the site plan. The first borehole was taken down to a depth of 24.6 M. The second borehole was taken down to 10.6 M. depth. The fieldwork was carried out during 24TH August 2018 to 25TH August 2018.

Undisturbed soil samples were tested in the laboratory for identification and to determine their strength and other Engineering characteristics. Based on the findings of the sub soil conditions, their strength and settlement properties, reasonable and appropriate soil parameters were obtained and recommended here in this respect.

Insitu and laboratory investigation

8/103, BEJOYGARH ABCON KOLKATA-700 032

ABCON

CHAPTER : II

Insitu and laboratory investigation

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

IN SITU AND LABORATORY INVESTIGATION

210 GENERAL

This chapter will present details, about the investigation that had been carried out at site and the laboratory.

220 IN SITU INVESTIGATION

The various field operations adopted during the course of these investigations are discussed in brief below.

230 BORING

Bore holes of 200 mm diameter were advanced into the soil by rotating hand Augar and wash boring technique upto the desired depth below ground level. This was done by rotating extension tubes having a cutter at the bottom and simultaneously pumping bentonite slurry of 5% concentration into extension tubes through a water swivel by hand pump in order to prevent collapse of side walls and bearing up on bottom soils of the bore holes.

240 COLLECTION REPRESENTATIVE SAMPLES

Representative soil samples were collected frequently from Augar split spoon sampler of standard penetrometer and cutting show of undisturbed sampling to maintain a continuous record of strata encountered. All the sampling to maintain a continuous record of strata encountered. All the sampling was levelled and placed in airtight polythene bag and shifted to the laboratory for identification and testing.

250 STANDARD PENETRATION TEST

In each bore hole standard penetration test was done at selected depths as per IS 2131: 1963, using a terzaghi splits spoon sampler driven by a 65 Kg hammer falling freely through a height 750 mm. The N values were recorded by counting the number of blows required to drive

the spoon sampler from 15.0 to 45.0 cm. The N values thus obtained are given in the bore log data sheets and illustrated, graphically as shown in fig.

260 COLLECTION OF UNDISTURBED SAMPLES

The undisturbed samples were collected by means of a two-tier 100-mm internal diameter and 450 mm length open drive sampling assembly conforming to IS 2132: 1972. The area ratio, based on IS 2132: 1972 was with 15% before sampling the boreholes were thoroughly clean. The sampling assembly was driven to the required depth manually with the help of a Jarring Link. After withdrawal from bore hotels the tubes were properly sealed by wax at both ends, labelled and transported to laboratory at convenient time thereafter.

270 GROUND WATER LEVEL

Water levels in the boreholes were observed during and after completion of boring operation. The final water levels were reduced in the field and are shown in the individual bore logs and test-boring summary. The average depth of water level was found at 0.7 M below E.G.L. Considering seasonal variation, water level may be considered at the height level.

280 SUMMARY OF BORING DATA

The following table summarises the soil boring data at each location.

BORE HOLE NO.	R L AT GROUND IN M (APPROX.)	TERMINATION DEPTH (M)	DEPTH IN GROUND WATER (M)
1	0.0	24.6	0.7
2	0.0	10.6	0.7

290 LABORATORY INVESTIGATION

The soil samples from 100 mm diameter sample tables were extracted in the laboratory by pushing out the soil core with the help of extractor frame. The soil samples were jacked out

in the direction of corresponding to the direction of entry of soil inside the tubes during sampling in the borehole. The following laboratory tests are done at our company. All the tests were done as per relevant IS Codes:

1)	Test for index properties	:	Liquid limit and plastic limit test
2)	Test for grain size distribution	:	Sieve and hydrometer analysis
3)	Shear tests	:	Triaxial shear tests unconfined compression test
4)	Oedometer tests	:	For consolidation properties

Besides above tests for physical properties like bulk and dry density. Natural Moisture Content, specific gravity was also performed in required numbers as instructed.

All the laboratory test results are tabulated in Appendix - I

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

CHAPTER: III

Subsoil profile

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

SUB SOIL PROFILE

310 GENERAL

The explanatory borings at the site revealed a medium quality of sub-soil. The generalised soil profile with the variation of 'N' values with depth is also shown in the Figs. Based on visual classification and results of field and laboratory tests five major strata are identified. Brief description of the various soil strata are given below:

STRATUM: I (0.0 M to 4.5 M)

Stratum-IA consists of Soft To Medium Brownish Grey Silty Clay / Clayey Silt up to 4.5 M depth from E.G.L. The stratum-I has average thickness of 4.5 M. This stratum has moderate strength and should be able to carry small to moderate columns loads. The average N value of this layer is 4/5.

Average engineering properties of these stratums from laboratory testing are as follows:

C	:	3.0 t/m^2
N M C	:	31.95 %
L L	:	47.0 %
P L	:	21.0%
Bulk Density	:	1.82 t/m^3
m_v	:	0.0049 M^2/T for pressure range (5-10) T/m^2

STRATUM: II (4.50 M to 15.0 M)

From about 4.50 M depth the subsoil consists of Very Soft To Soft Dark Grey Silty Clay With Organic Materials And Decomposed Wood layer. This stratum starts from 4.50 M depth and continues up to the depth of 15.0 M. The average thickness of this layer is about 10.5M. The average N value is 3. The compressibility of this stratum is high.

The average engineering properties of this stratum from laboratory testing are as follows:

C	:	1.9 t/m^2
N M C	:	40.16%
L L	:	63.0 %
P L	:	28.0 %
Bulk Density	:	1.68 t/m^3
m_v	:	0.0064 M^2/T for pressure range (5-10) T/m^2

STRATUM: III (15.0 M to 24.0 M)

This stratum consists Medium Light Bluish Grey Silty Clay With Kankars. It starts from 15.0 M depth and continues up to the depth of 24.0 M. The average thickness of this layer is about 9.0 M. The average N value is 11. The subsoil condition improves considerably with the appearance of this stratum. The consistency of this stratum is stiff.

The average engineering properties of this stratum from laboratory testing are as follows:

C	:	5.0 t/m^2
N M C	:	30.50%
L L	:	50.0 %
P L	:	23.0 %
Bulk Density	:	1.87 t/m^3
m_v	:	0.0040 M^2/T for pressure range (5-10) T/m^2

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

STRATUM: IV (24.0 M to 24.6 M)

From about 24.0 M depth the subsoil consists of Medium Dense Brownish Grey Silty Fine Sand With Mica and continues up to 24.6 M depth i.e. up to the depth of termination. No undisturbed samples were recovered from this stratum. As such no properties could find out. Average 'N' value of this layer is varying from 23.

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

SEQUENCE OF SUB SOIL STRATIFICATION

STRATUM	D E S C R I P T I O N	DEPTH IN METRE		THICKNESS	N
		FROM	TO	IN METRE	VALUES
I	Soft To Medium Brownish Grey Silty Clay / Clayey Silt	0.0	4.5	4.5	5
II	Very Soft To Soft Dark Grey Silty Clay With Organic Materials And Decomposed Wood	4.5	15.0	10.5	2 To 3
III A	Medium Light Bluish Grey Silty Clay With Kankars	15.0	18.0	3.0	6
III B	Stiff Brownish Grey Silty Clay / Clayey Silt	18.0	24.0	6.0	15
IV	Medium Dense Brownish Grey Silty Fine Sand With Mica	24.0	>24.6	>0.6	23

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

CHAPTER: IV

Discussion

DISCUSSION

410 GENERAL

In this section, discussions regarding the various geo-technical aspects of selection of a suitable foundation system are being detailed.

420 CRITERIA FOR CHOICE OF FOUNDATION

From the information, it is planned to construct a G + Three-Storied building at the proposed site. As such it is assumed that maximum loading intensities will be around 6.0 t/m^2. On the basis of this assumption, inference is made for the type of foundation to be adopted and its bearing capacities. However, in general, foundation design should satisfy two basic requirements:

a) There must be adequate factor of safety of the foundation against any possible bearing capacity failure, &

b) The settlement of the foundation must be within permissible limits as defined in IS: 1904.

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

430 DEPTH OF FOUNDATION

Foundation for the building (structure) depends upon the height of the structure, load coming to the subsoil and type of subsoil deposit. At present excepting the nature of subsoil, all other details are unknown. However the suitability of different types of foundation may be investigated in the light of the above requirements.

A study of the sub soil characteristics at the site reveal that a layer of Soft To Medium Brownish Grey Silty Clay / Clayey Silt of stratum –I exists up to 4.50 M. depth. The average N value of this layer is 4-5. The Stratum -I has moderate strength and should be able to support small to moderate column loads on spread footings. The Soft Dark Grey Silty Clay With Organic Materials of stratum - II, lying below stratum-I has low strength and consequently low bearing

capacity. It would be desirable that a spread footing should be placed as high as in stratum –I as possible, so that stresses in stratum –II due to foundation loading gets less by dispersion through stratum-I.

The behaviour of such spread footing would be governed primarily by the properties of this stratum-I which has an average thickness of 4.50 M and an average undrained sheer strength of 3.0 t/m^2.

The net ultimate bearing capacity of shallow footings may, accordingly, be calculated from the undrained sheer properties of stratum I as per IS: 6403 and by using the following equation: $Q_{ult} = C\ N_c\ S_c\ d_c\ I_c$

Where,

C	=	Undrained shear strength of stratum-1	=	3.0 t/m^2
N_c	=	Bearing capacity factor	=	5.14
γ	=	1.83 T/m^2		
$S_c\ d_c\ I_c$	=	Shape, depth & inclination factor		
D_f	=	Depth of foundation	=	1.5 M below E.G.L.

8/103, BEJOYGARH ABCON KOLKATA-700 032

CHAPTER: V

Calculation

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

CALCULATION

510 BEARING CAPACITY FOR DIFFERENT FOOTING

The bearing capacities for different types of foundation placed 1.5 m below G.L are as follows:

i) 1.5 M wide Strip placed 1.5 M below E.G.L.

$S_c=I_c$	1.0
d_c	1.35
C	3.0 t/m^2
q_{ult}	3.0x 5.14 x 1.35 t/m^2 = 20.82 t/m^2

For a factor of safety of 3.0 the allowable bearing capacity is 6.94 t/m^2

ii) 2.0 M wide Strip, D_f = 1.5 M below E.G.L.

$S_c=i_c$	1.0
D_c	1.26
C	3.0 t/m^2
Q_{ult}	3.0 x 5.14 x 1.26 t/m^2 = 19.43 t/m^2

For a factor of safety of 3.0 the allowable bearing capacity is 6.48 t/m^2

iii) 2.0 M X 2.0 M isolated square, D_f = 1.5 M below E.G.L.

S_c	1.0
I_c	1.3
D_c	1.26
C	3.0 t/m^2
Q_{ult}	3.0 x 5.14 x 1.26 x 1.3 = 25.26t/m^2

8/103, BEJOYGARH ABCON KOLKATA-700 032

For a factor of safety of 3.0 the allowable bearing capacity is 8.42 t/m^2

iv) 2.5 M x 2.5M isolated square, df=1.5M below E.G.L.

S_c	1.3
I_c	1.0
D_c	1.21
C	3.0 t/m^2
q_{ult}	3.0 x 5.14 x 1.21 x 1.3 = 24.25 t/m^2

For a factor of safety of 3.0 the allowable bearing capacity is 8.08 t/m^2.

v) 2.0 M x 3.0 M rectangular footing placed 1.5 M below E.G.L.

S_c	1.13
I_c	1.0
d_c	1.26
C	3.0 t/m^2
q_{ult}	3.0 x 5.14 x 1.26 x 1.13 = 21.96 t/m^2

For a factor of safety of 3.0 the allowable bearing capacity is 7.32 t/m^2

vi) 2.5 x 3.5M rectangular footing placed 1.5M below E.G.L.

S_c	1.14
I_c	1.0
d_c	1.21
C	3.0 t/m^2
q_{ult}	3.0X 5.14 x 1.21 x 1.14 = 21.27 t/m^2

8/103, BEJOYGARH ABCON KOLKATA-700 032

For a factor of safety of 3.0 the allowable bearing capacity is 7.09 t/m^2

For a minimum factor of safety of 3.0 against bearing capacity failure, the net permissible bearing capacity would work out to between 6.48 t/m^2 to 8.42 t/m^2. The safe permissible bearing capacity should, however, be determined from consideration of allowable settlement.

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

The settlement of 2.0/2.5 M wide isolated footings / rectangular footing may be calculated from the compression of significant depth of soil below the footing, using the expression:

$S_c = m_v \cdot \Delta P \cdot H$

Where, H = Thickness of stratum (Compressible stratum)

ΔP = Increase of pressure due to foundation loading at the centre of the layer.

m_v = Co-efficient of volume change = 0.0049 M^2/T for pressure range (5 – 10) T/m^2.

520 SETTLEMENT FOR STRIP FOOTING

i) 1.5 M wide strip

Q	6.9 t/m^2
Δp	(6.9 x 1.5)/3.0 = 3.45 t/m^2
m_v	0.0049 M^2/T
H	4.0 M
S_c	0.0049 x 3.45 x 4.0 = 6.76 cm

Hence OK

ii) 2.0 M wide strip

Q	6.2 t/m^2
Δp	(6.2 x 2.0)/4 = 3.10 t/m^2
m_v	0.0049 M^2/T
H	5.0 M
S_c	0.0049 x 3.10 x 5.0 = 7.60 cm

Which Is Slightly More Than Permissible Value.

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

530 FOR ISOLATED SQUARE

i) 2.0 M X 2.0 M isolated square

Q	8.40 t/m^2
Δp	(8.40 x 2.0 x 2.0)/(3.5 x 3.5) = 2.74 t/m^2
m_v	0.0049 M^2/T
H	4.0 M
S_c	0.0049 x 2.74 x 4.0 = 5.38 cm

Hence OK

ii) 2.5 M x 2.5 M isolated square

Q	8.0 t/m^2
Δp	8.0 x(2.5 x 2.5) / (4.4 x 4.4) = 2.58 t/m^2
m_v	0.0049 M^2/T
H	5.0 M
S_c	0.0049 x 2.58 x 5.0 = 6.32 cm

It is O.K.

SETTLEMENT FOR RECTANGULAR FOOTING

i) 2.0 M X 3.0 M rectangular

Q	7.3 t/ m^2
Δp	(7.3 x 2.0 x 3.0)/(3.5 x4.5) = 2.78 t/m^2
m_v	0.0049 M^2/T
H	4.0 M
S_c	0.0049 x 2.78 x 4.0 = 5.45 cm

Hence OK.

8/103, BEJOYGARH ABCON KOLKATA-700 032

ii) 2.5 M x 3.5 M rectangular

Q	7.0 t/m^2
Δp	$(7.0 \times 2.5 \times 3.5)/(4.4 \times 5.4) = 2.57$ t/m^2
m_v	0.0049 M^2/T
H	5.0 M
S	$0.0049 \times 2.57 \times 5.0 = 6.29$ cm

It is O.K.

Thus, it appears that individual spread footings; say up to 2.5 M wide may be placed in stratum-I, 1.5 M below E.G.L. with a net permissible bearing pressure of 7.0 t/m^2 while 2.0 M wide strip footings would have a net permissible bearing pressure of 6.3 t/m^2. This will ensure adequate factor of safety against bearing capacity failure and the settlement will be within permissible limits. For any other size of footing the estimated settlement for the chosen bearing pressure should be checked.

CHAPTER: VI

Recommendation

And

Conclusion

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

• Soil Investigator
• Civil Engineers
9883179050
9836611978

RECOMMENDATION AND CONCLUSION

Based on the field and laboratory results and from the above discussions the following are summarised:

1) Stratum- I is capable of supporting loads from small loaded structures. It is suggested to place the foundation for the proposed structure at about 1.50 M below the E.G.L. and the water level was also observed at 0.7 M below E.G.L.

2) The bearing capacities worked out as per IS: 6403 along with the computed settlement are presented below considering the effect of W.L. on the footings and neglecting the settlement due to non-cohesive deposits below footings. The sub soil below footings should be well compacted before placing any foundation.

SL. NO.	SIZE & TYPE OF FOOTING	FOUNDATION DEPTH BELOW E.G.L.	NET BEARING CAPACITIES	ESTIMATED SETTLEMENT (Without immediate settlement)
		M	t/m²	CM
1.	**Strip footing**			
i)	**1.5 M wide**	1.50	6.90	6.76
ii)	**2.0 M wide**	1.50	6.20	7.60
2.	**Isolated square**			
i)	**2.0 M x 2.0 M**	1.50	8.40	5.38
ii)	**2.5 M x 2.5 M**	1.50	8.00	6.32
3.	**Rectangular footing**			
i)	**2.0 M x 3.0 M**	1.50	7.30	5.45
ii)	**2.5 M x 3.5 M**	1.50	7.00	6.29

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

ABCON
8/103, Bijoygarh, Jadavpur
Kolkata-700 032

- Soil Investigator
- Civil Engineers

9883179050
9836611978

3) If the variation of column load is considerably high and local soil is different, it is suggested to adopt tie beams at any suitable depth to counter act differential settlement.

4) For higher loading if shallow footing may not be suitable, in such cases Pile foundation is recommended.

5) Sufficient gaps should be provided in between footings to avoid over stress in adjacent footing.

6) Existence of near by structure should also be given due consideration.

7) Construction in stages is also advised.

S. Chakrabarti

GEOTECHNICAL CONSULTANT

SANKAR CHAKRABARTI
M. Tech (SOIL), MIGS
Consultant, Geotechnical Engg.
Enlishment No. 004/G.T.E./RJPSON

FOR **ABCON**

PROPRIETOR

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

ABCON

CHAPTER: VII

Appendix

ABCON

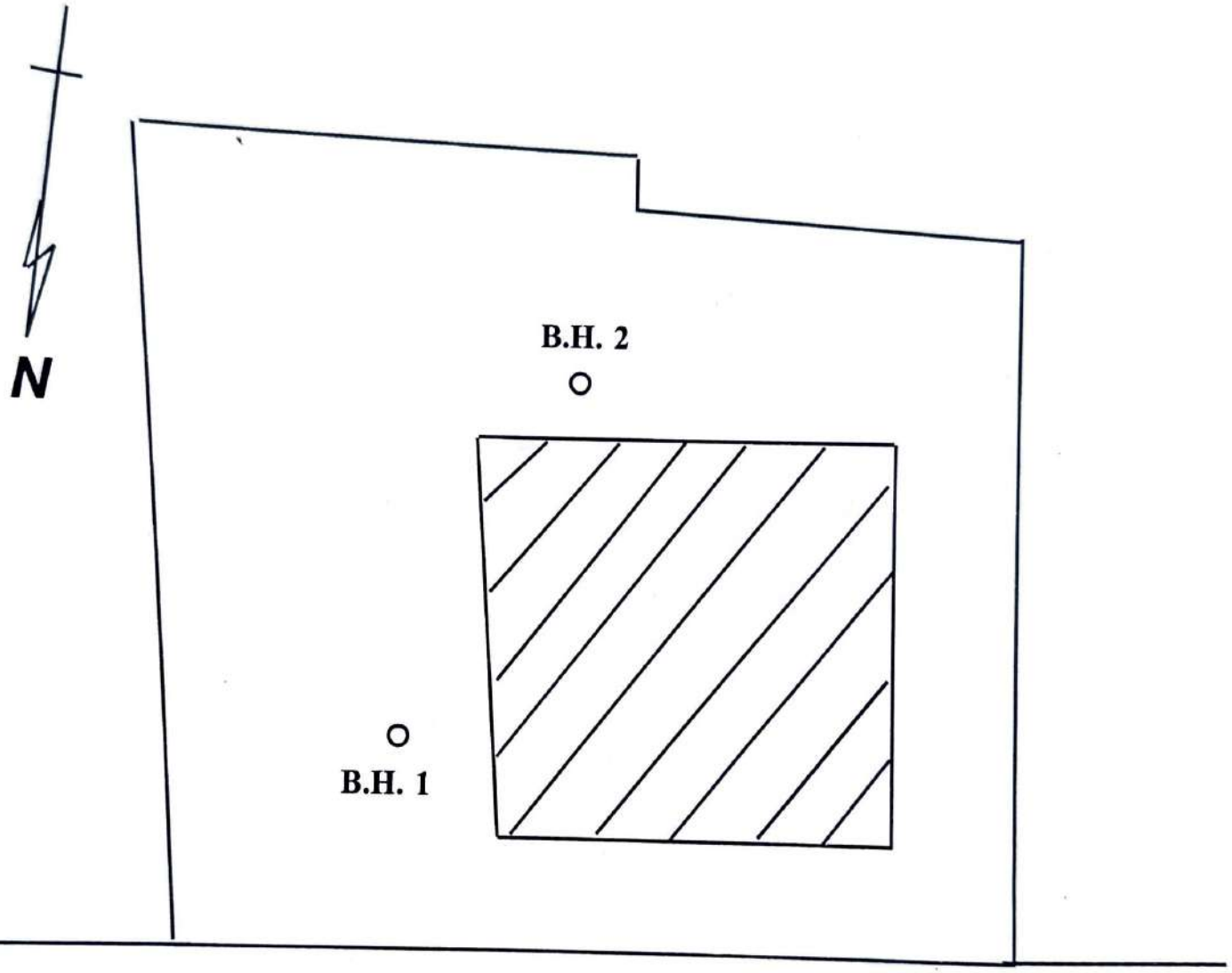
8/103, Bejoygarh, Jadavpur, Cal-32. Ph.-3290-1415, 2462-2672

LABORATORY TEST RESULTS - SITE : PRANTIKA

	Depth (m)	Type of sample	Bulk density (kg/cm^2)	NMC (%)	Sp. Gr.	Atterberg Limit			Shear Strength			Consolidation	Grain Size		
						LL (%)	PL (%)	Type of test	UCS C(kg/cm^2)	C (kg/cm^2)	ϕ^0	m_v (cm^2/kg)	Sand (%)	Silt (%)	Clay (%)
1	3.00	UDS	1.82	31.95	2.65	47	21	UCS	0.30	-	-	0.049	5	64	31
	16.50	UDS	1.84	31.18	2.66	53	23	UCS	0.35	-	-	0.042	9	56	35
	18.00	UDS	1.89	29.84	2.67	47	23	UCS	0.65	-	-	0.038	10	63	27
	24.00	SPT	-	-	2.65	NP	NP	-	-	-	-	-	57	43	0
2	6.00	UDS	1.68	40.16	2.57	63	28	UCS	0.19	-	-	0.064	3	55	42

8/103, BEJOYGARH * ABCON * KOLKATA-700 032

SITE PLAN SHOWING BORE HOLE LOCATION AT 87, PASCHIM MAHAMAYAPUR, WARD NO. 28, RSM.



BORELOG DATA SHEET

BORE HOLE NO. : 1(ONE)

SITE : PRANTIKA-1

DIA. OF BORE HOLE : 150 MM.

DEPTH OF BORE HOLE : 24.60 M.

FIELD TEST

(a) COMMENCED ON : 24.8.2018

(b) COMPLETED ON : 24.8.2018

TYPE OF BORRING : AUGER/WASH BORRING

LOCATION OF G.W.L. : 0.70m.

81103, BEJOYGARH ABCON KOLKATA-700 032

DESCRIPTION		Depth (m) From	Depth (m) To	Thickness (M)	N-Value	Type & marked	Samples Depth (M)
Soft to medium brownish grey silty clay /clayey silt		0.00	4.50	4.50	-	DST	1.00
					5	SPT	1.50
					-	UDS	3.00
					3	SPT	4.50
Very soft to soft dark grey silty clay with organic materials and decomposed wood		4.50	15.00	10.50	2	SPT	6.00
					2	SPT	7.50
					2	SPT	9.00
					2	SPT	10.50
					3	SPT	12.00
					3	SPT	13.50
Medium light bluish grey silty clay with kankars		15.00	18.00	3.00	6	SPT	15.00
					-	UDS	16.50
Stiff brownish grey silty clay / clayey silt		18.00	24.00	6.00	-	UDS	18.00
					15	SPT	20.00
					16	SPT	22.50
Medium dense brownish grey silty fine sand with mica		24.00	24.60	0.60	23	SPT	24.00

UDS-Undisturbed sample, SPT-Standard penetration test DS-Disturbed sample

BORELOG DATA SHEET

BORE HOLE NO. : 2(TWO)

SITE : PRANTIKA-1

DIA. OF BORE HOLE : 150 MM.

DEPTH OF BORE HOLE : 10.60M.

FIELD TEST

(a) COMMENCED ON : 25.8.2018

(b) COMPLETED ON : 25.8.2018

TYPE OF BORRING : AUGER/WASH BORRING

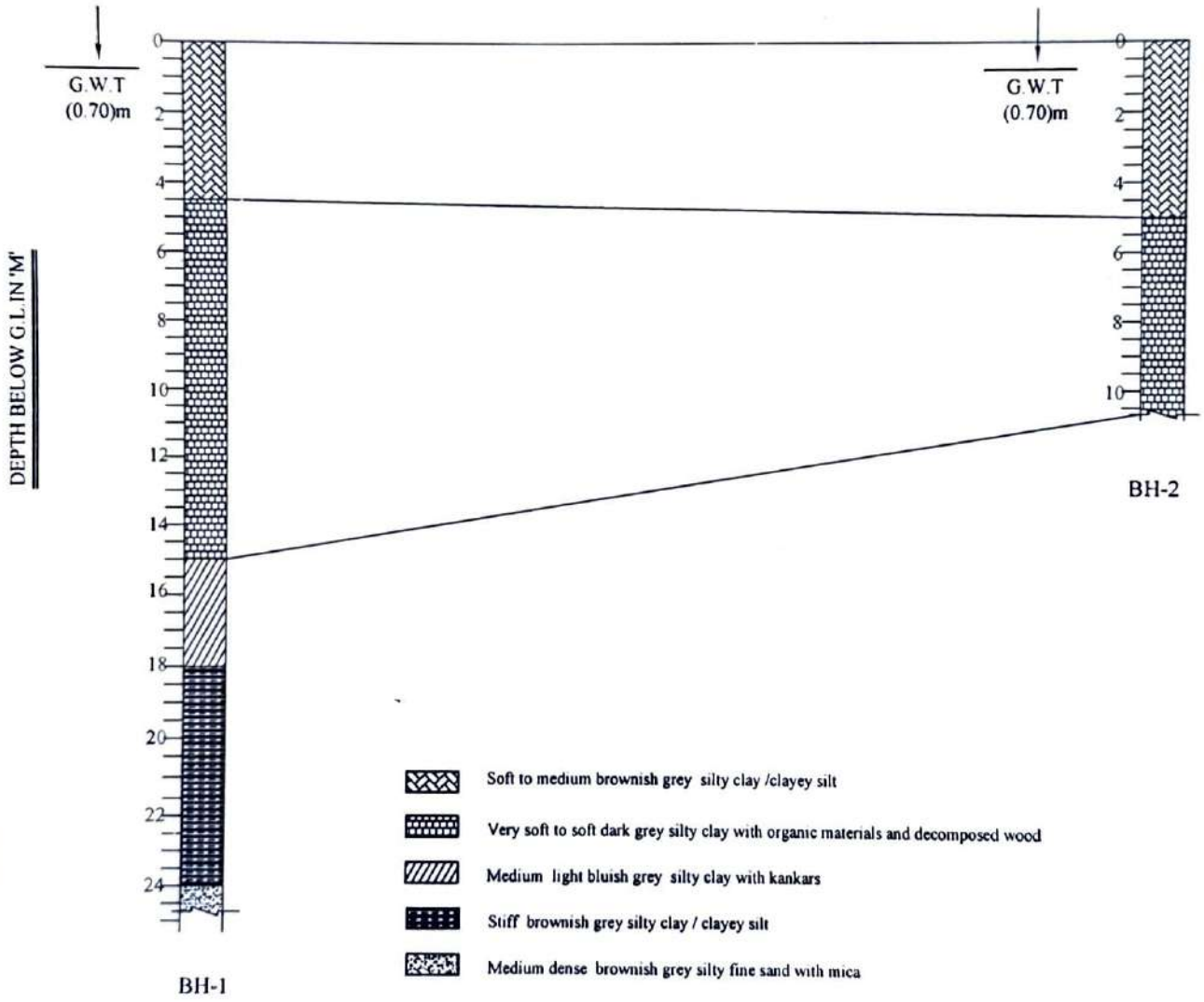
LOCATION OF G.W.L. : 0.70m.

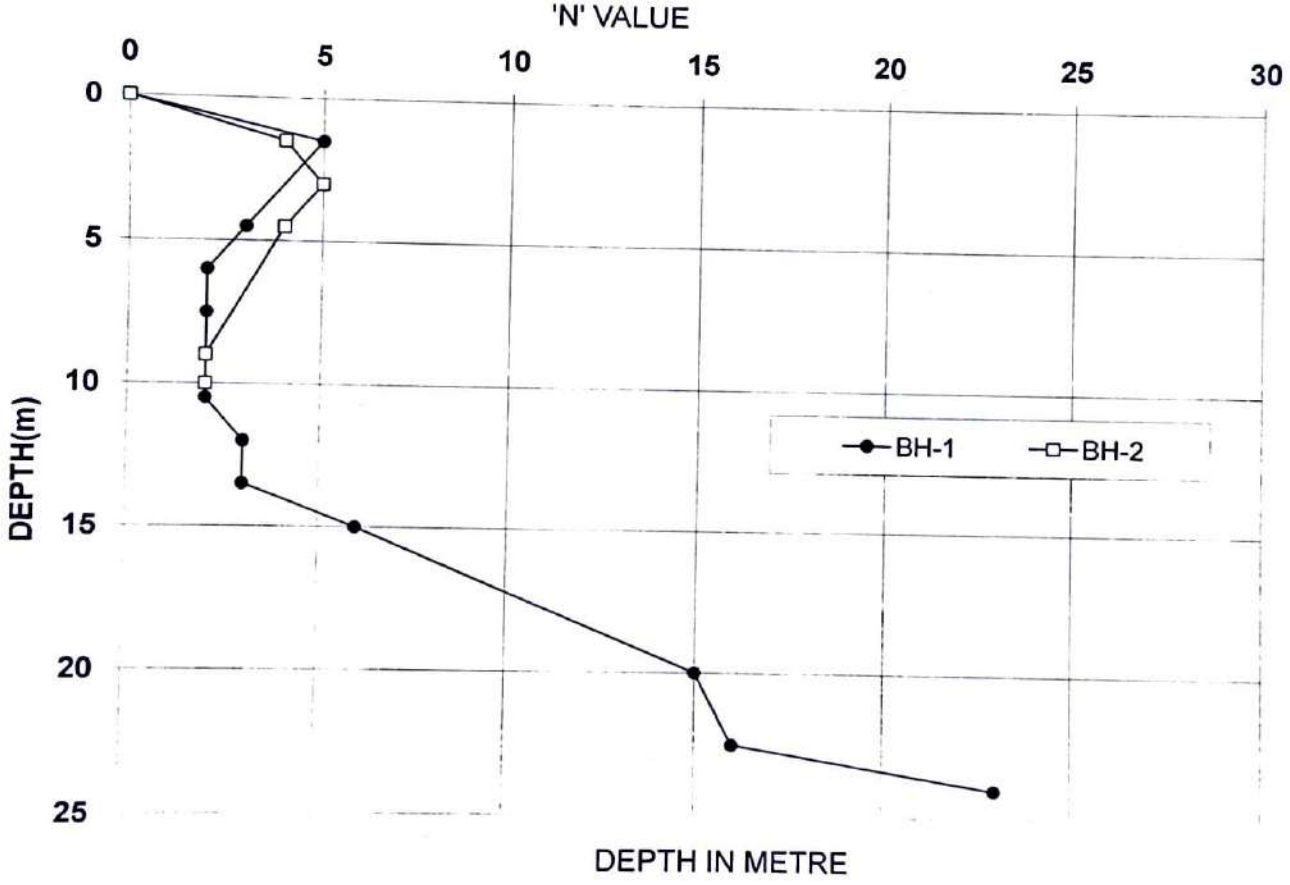
DESCRIPTION		Depth (m)		Thickness (M)	N-Value	Type & marked	Samples Depth (M)
		From	To				
Soft to medium brownish grey silty clay /clayey silt		0.00	5.00	5.00	-	SPT	1.00
					4	SPT	1.50
					5	SPT	3.00
					4	SPT	4.50
Very soft to soft dark grey silty clay with organic materials and decomposed wood		5.00	10.60	5.60	-	UDS	6.00
					2	SPT	7.50
					2	SPT	9.00
					2	SPT	10.00

UDS-Undisturbed sample, SPT-Standard penetration test DS-Disturbed sample

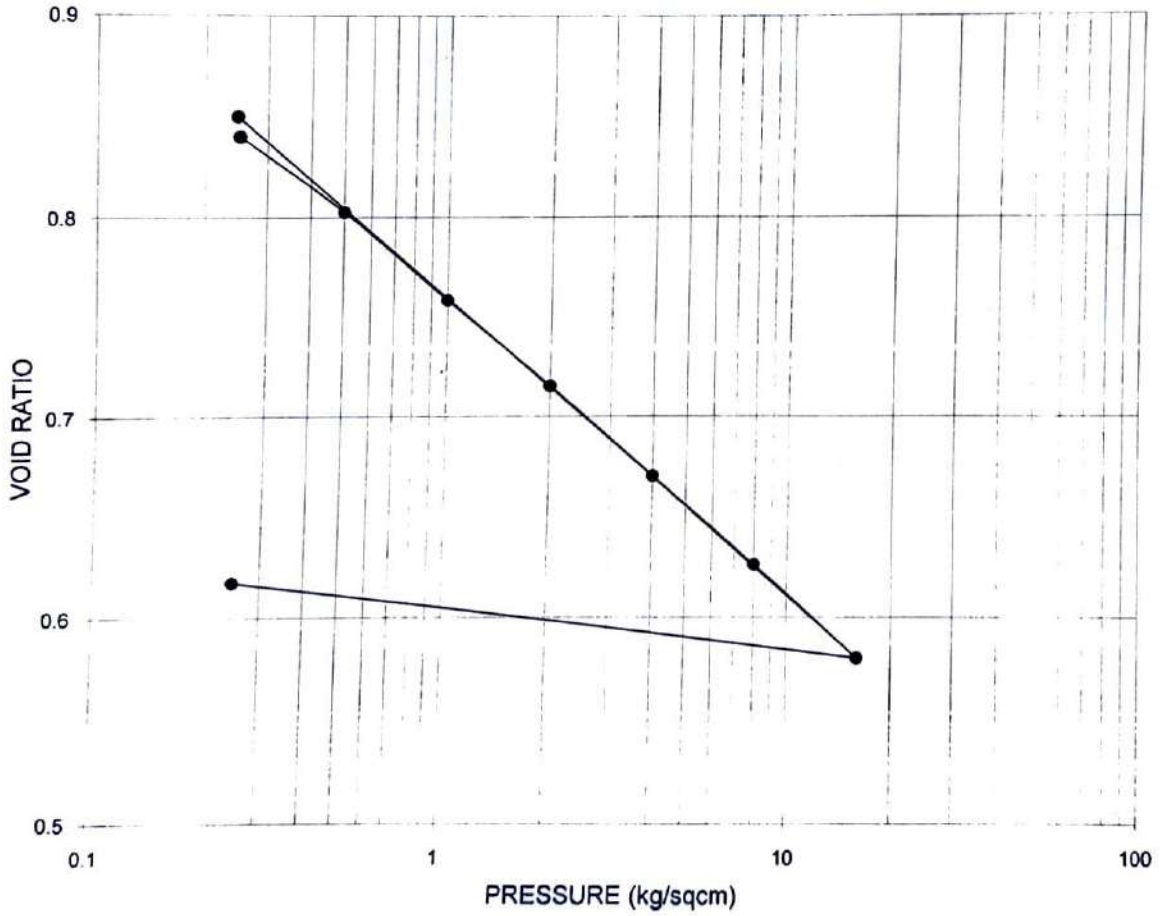
SOIL PROFILE THROUGH SELECTED BORE HOLES

SITE : PRANTIKA-1



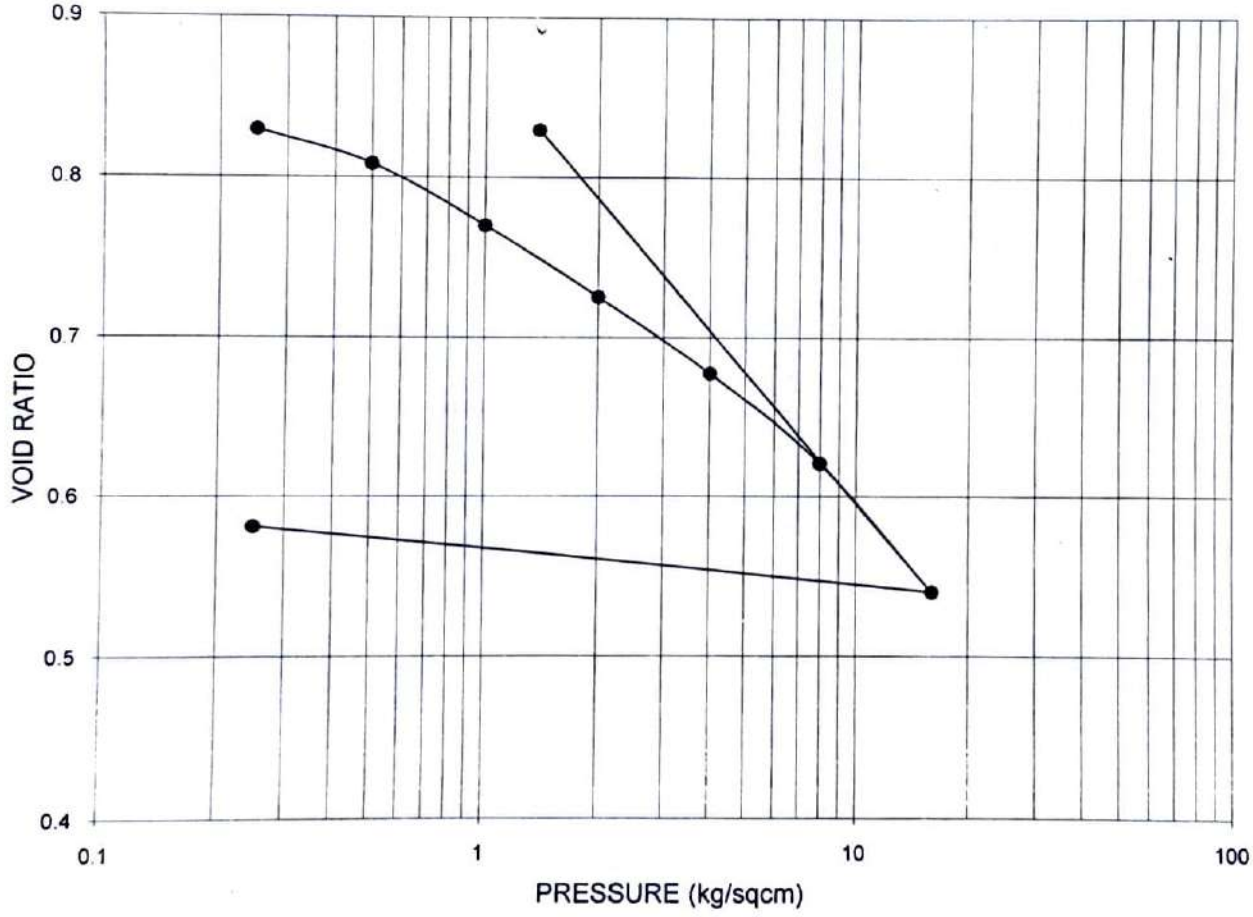


N-BLOWS/30CM, LOCATION : PRANTIKA-1



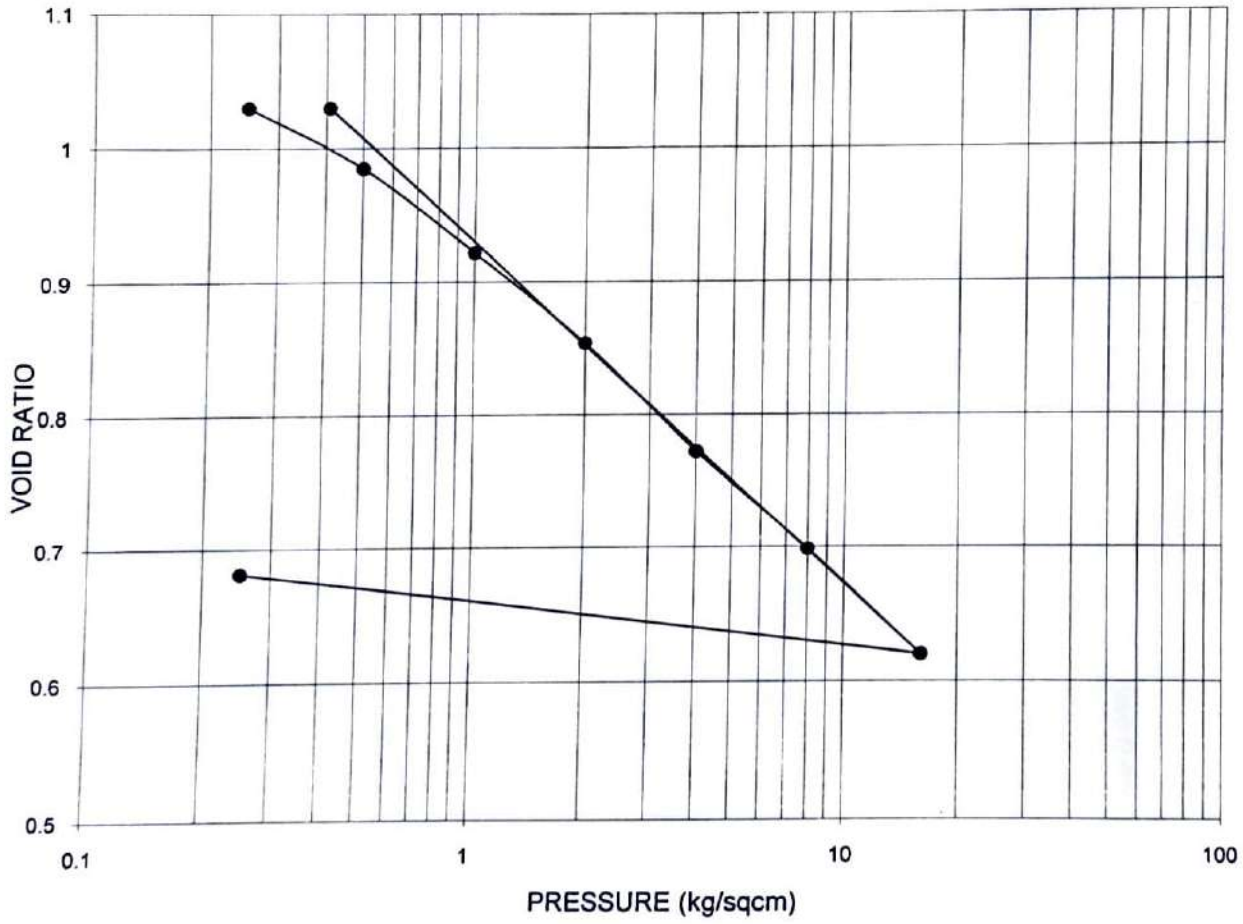
BH No. -1
Depth - 3.00m
e0 = 0.85
mv=0.049sqcm/kg
Cc=0.15

VOID RATIO VS LOGARITHIM OF PRESSURE CURVE SITE - PRANTIKA-1



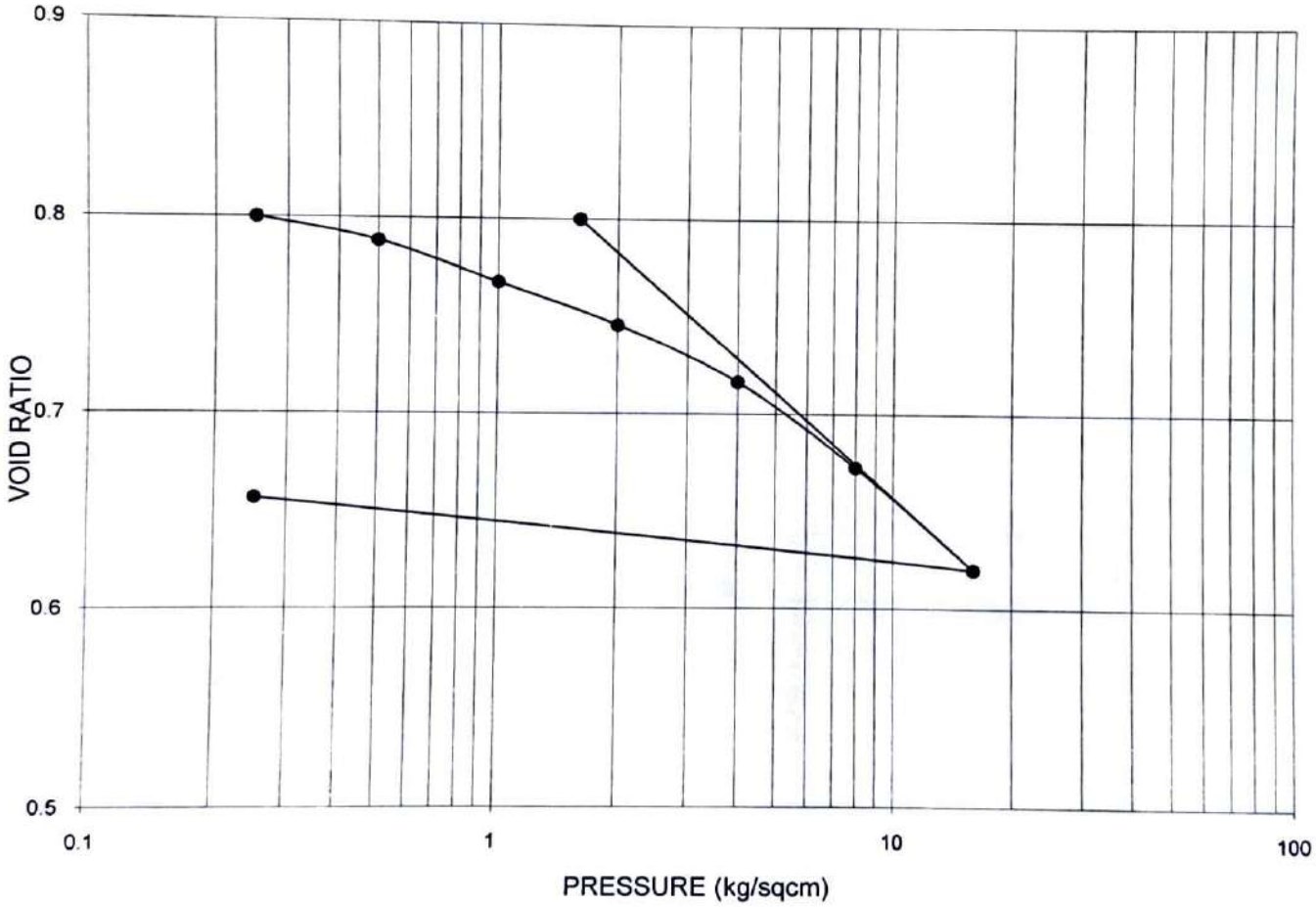
BH No. -1
Depth - 16.50m
e0 = 0.83
mv=0.042sqcm/kg
Cc=0.25

VOID RATIO VS LOGARITHIM OF PRESSURE CURVE SITE -PRANTIKA-1



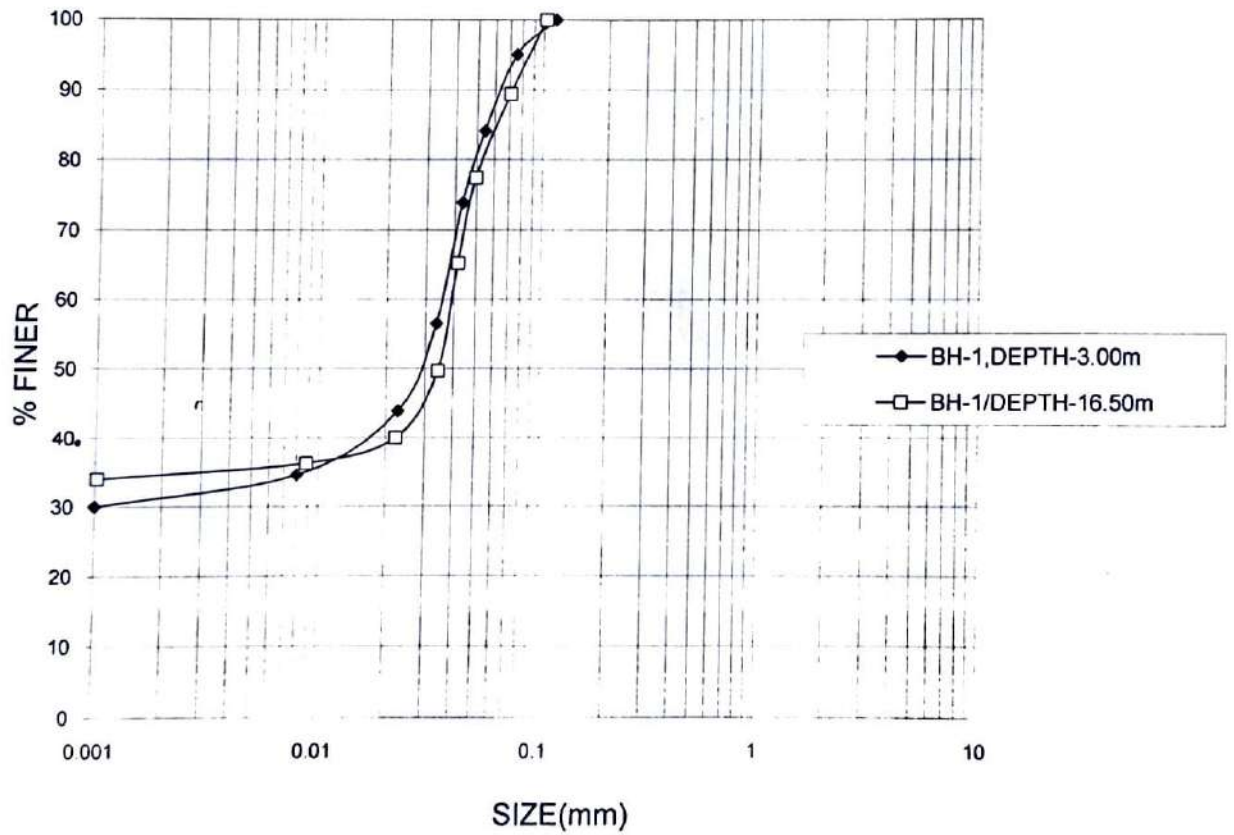
BH No. -2
Depth - 6.00m
e0 = 1.03
mv=0.064sqcm/kg
Cc=0.24

VOID RATIO VS LOGARITHIM OF PRESSURE CURVE SITE - PRANTIKA-1

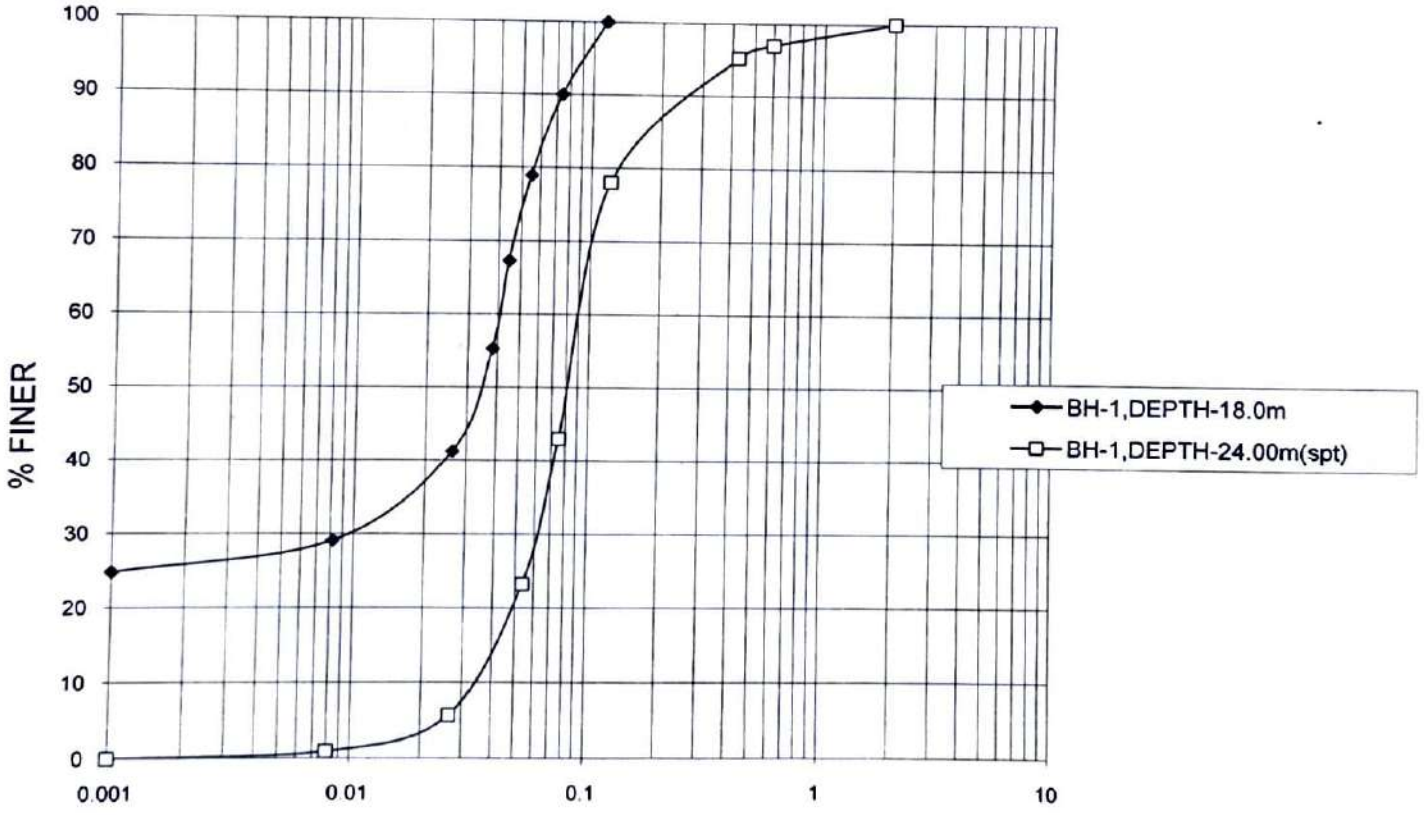


BH No. -1
Depth - 18.00m
e0 = 0.80
mv=0.024sqcm/kg
Cc=0.17

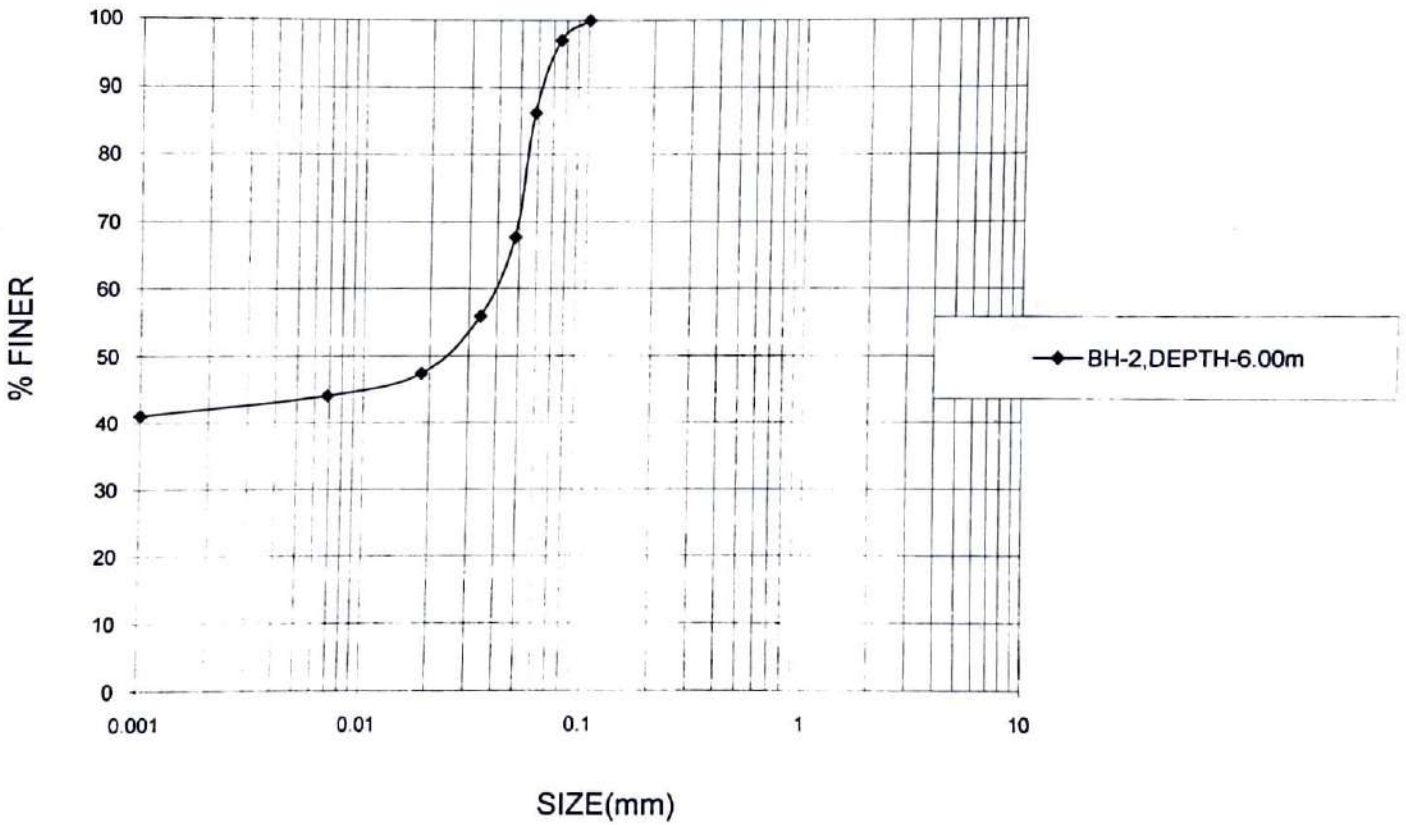
VOID RATIO VS LOGARITHIM OF PRESSURE CURVE SITE - PRANTIKA-1



PARTICLE SIZE DISTRIBUTION , CURVE .**SITE-:** PRANTIKA-1



PARTICLE SIZE DISTRIBUTION CURVE .**SITE-: PRANTIKA-1**



PARTICLE SIZE DISTRIBUTION CURVE .**SITE-: PRANTIKA-1**