PN – 210323

REPORT ON

GEOTECHNICAL INVESTIGATIONS

FOR THE PROPOSED

Sarvodya High School
at
Guriyan, Block - Nuaon,
Dist. Kaimur

Your Letter No.- BSEIDC/TECH/1960/2018-1369 Dated – 02.03.2021
[Sl. No. 10]

Submitted to
The Chief Engineer
BSEIDC, Patna

April, 2021

BIHAR FOUNDATION CONSULTANTS
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Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur

Bihar Foundation Consultants
403, Ganga Darshan Apartment, Patna-10
[A Unit : Baidyanath Foundation Consultants Pvt. Ltd.]

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CONTENTS

Appendix

[Containing Figures and Tables]

1. INTRODUCTION

The subsoil investigations reported herein were taken up (vide W.O. No. BSEIDC/Tech/1960/2018-1369 Dated – 02.03.2021 [Serial No. 10] to find out the nature of subsoil at the site of the proposed construction and to recommend the capacity and type of its foundation. After certain tests on the soil, as detailed below, the desired recommendations have been made on **page 3** of this Report.

2. FIELD WORK

The fieldwork consisted of sinking a bore hole, conducting the necessary field tests in it and collecting soil samples from it for conducting laboratory tests on them.

2.1. Boring

Taking guidance from IS: 1892, one bore hole of 150 mm diameter was sunk at the location shown in the bore hole location map.

2.2 Sampling

2.2.1 Undisturbed Soil Samples

Open drive samplers of 100-mm diameter and about 450-mm length were used for obtaining undisturbed samples of cohesive soils. The collection, sealing, labeling and transportation of the samples to the laboratory were done as per the IS guide-lines.

2.2.2 Disturbed Soil Samples

Disturbed soil samples were collected from the bore hole at suitable intervals of depth (not more than 2.5 m) and at all depths of change in the nature of the subsoil. These samples were sealed in polythene bags with proper identification labels.

2.3 Field Tests

2.3.1 Standard Penetration Tests (SPT)

These tests were conducted as per IS: 2131 – 1963. The depth interval between two consecutive tests was 1 to 1.5 m. The tests were located in between the levels at which undisturbed soil samples were collected.

3. LABORATORY TESTS

Some or all of the following laboratory tests, as necessary, were done on the collected soil samples. Representative soil samples were selected for this from the different soil strata encountered during boring. The tests were performed as per the relevant Indian Standard Codes of Practice.

(a) Natural moisture content
(b) Bulk density
(c) Grain size analysis (using sieves and / or hydrometer)
(d) Specific gravity of soil solids
(e) Atterberg's limit tests (liquid, plastic and shrinkage limits)
(f) Shear Tests :
- [I] Triaxial compression test (unconsolidated – undrained), generally for fine- grained soils
- [II] Unconfined compression tests, only on cohesive soils
- [III] Direct shear tests, generally for coarse-grained soils

(g) Chemical tests on soil/ground water
(h) Other tests as and when required.

4. PRESENTATION OF TEST RESULTS

The field and laboratory test results are given in the **Appendix - B**.

5. SOIL STRATIFICATION

The results of field tests in three bore holes sunk at the site [vide Location Sketch in App. A] and the results of laboratory tests conducted on the collected soil samples indicate that the soil stratification at the site is as describe below.

The subsoil in all BH's is sandy silty clay / silty clay [type CI] up to the investigated depth of 10.5 m bgl. It is also gritty from about 3.0 m to 10.5 m depth bgl.

Ground water table was struck at about 4.20 m to 4.30 m depth below GL in March, 2021. It is subject to seasonal variations.

6. FOUNDATION ANALYSIS

The safe capacity of foundation of any type and size may be determined on the basis of the soil data given in this Report by using the standard methods of foundation design and following the relevant Indian Standard Codes.

7. RECOMMENDATIONS

The design of the foundation for the proposed structure depends on the nature of both [a] the subsoil and [b] the structure.

The subsoil in all BH's is sandy silty clay / silty clay [type CI] up to the investigated depth of 10.5 m bgl. It is also gritty from about 3.0 m to 10.5 m depth bgl.

Ground water table was struck at about 4.20 m to 4.30 m depth below GL in March, 2021. It is subject to seasonal variations.

In the present case,

1. The proposed structure may be provided with shallow foundation at a depth of 1.5 m or more.
2. The subsoil below top soil is stiff to very stiff. Hence placement of bored cast in situ plane or u/r piles may be difficult. Hence they are not recommended in the present case. Driven piles will be uneconomical.

   The values of net allowable bearing pressures of foundations of certain sizes and depths have been calculated [vide sample of Calculation in Appendix - F] and are tabulated below.

Table 1: Allowable Net Bearing Pressures [q_{na}] and Settlements Expected [s]

Depth (m) below GL	Width (m)	Net allowable bearing pressure (t/m^2)			Maximum expected settlement (mm)
		Strip footing	Square footing	Raft foundation	
1.5	2.0	8.0	14.1	....	75
	3.0	5.6	9.8	....	75
	10.0	...	...	7.7	100
2.0	2.0	9.4	16.5	....	75
	3.0	6.4	11.2	....	75
	10.0	...	...	8.2	100
2.5	2.0	10.8	18.9	....	75
	3.0	7.2	12.6	....	75
	10.0	...	...	8.7	100
3.0	2.0	12.3	20.0*	....	75
	3.0	8.0	14.0	....	75
	10.0	...	...	9.2	100
3.5	2.0	13.6	20.0*	....	75
	3.0	8.8	15.4	....	75
	10.0	...	...	9.6	100
4.0	2.0	15.1	20.0*	....	75
	3.0	9.6	16.9	....	75
	10.0	...	...	10.2	100
4.5	2.0	16.7	20.0*	....	75
	3.0	10.5	18.4	....	75
	10.0	...	...	10.7	100

*****The calculated values are 20.0 (t/m^2) or more, but for the sake of safety they have been limited to 20.0 (t/m^2).

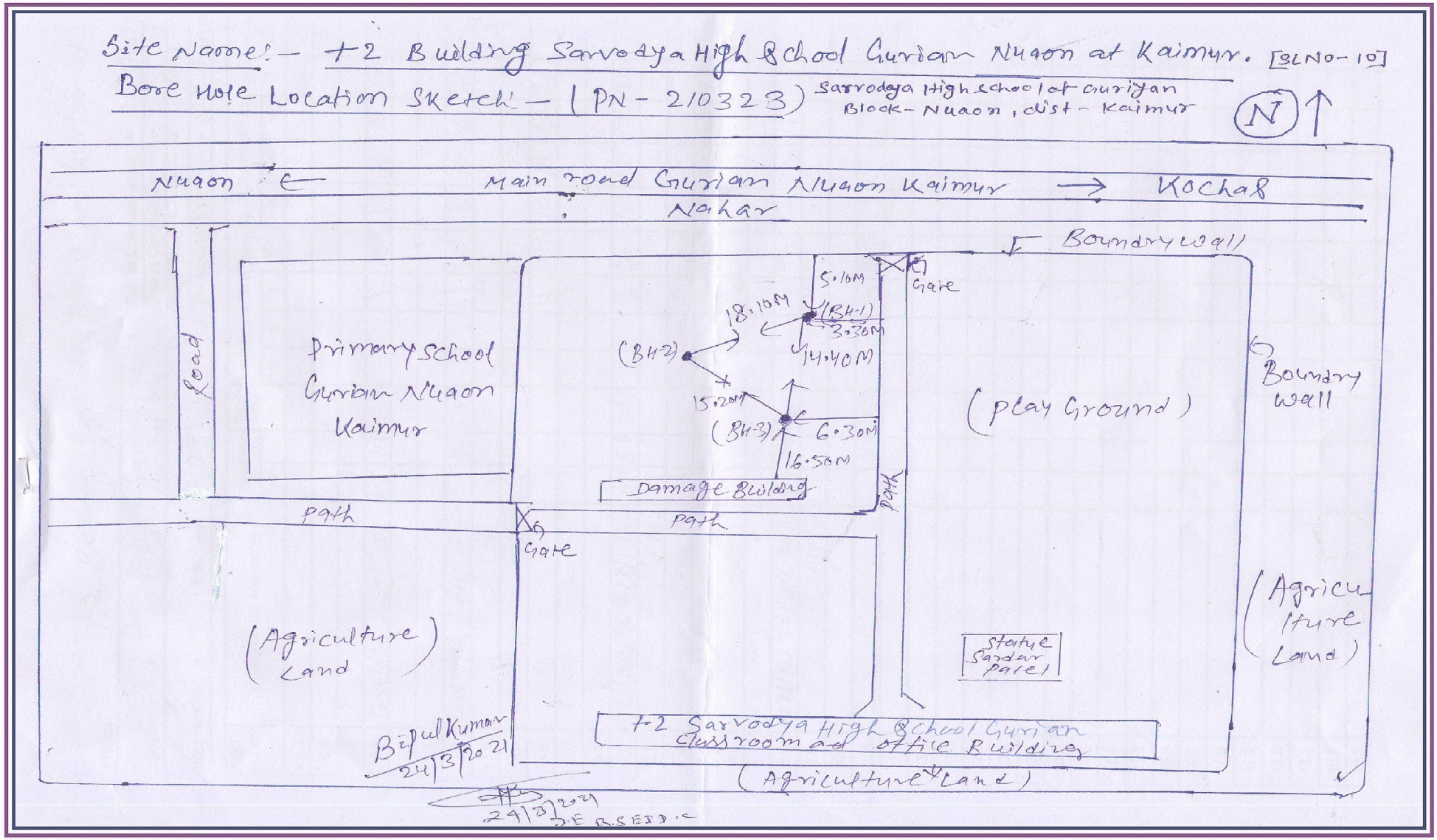
Note:

If a soil condition much different from those reported herein is met with during foundation trenching, suitable steps should be taken.

For Bihar Foundation Consultants,

(Prof. C.N. Sinha, Dr.-Ing., FIE)
Chief Consultant.

Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur



Bihar Foundation Consultants
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Appendix - A

NAME OF WORK : Sub soil Investigation for C/O							BORING FINISH DATE : 23.03.2021					WATER TABLE : 4.20 m bgl.				
Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur							BORING METHOD : Rotary									
BORE HOLE NO. : 1			Site Incharge - Bipul Kumar				TERMINATION DEPTH : 10.5 m					RECORD ON : 23.03.2021				

Depth Below GL (m)	Sample No.	SPT 'N' Value observation	Visual Description of Soil with IS Classification	Depth(m)		Thickness (m)	Liquid Limit	Plastic Limit	Plasticity Indix,%	Bulk Density (gm/cm3)	Natural Moisture Content (%)	Specific Gravity	Shear Test			Compression Index (C_c)
													Type of Test	Cohesion, c (kg/cm2)	Friction Angle, f°	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		3.0										
1.5	S1	18					42.0	24.0	18.0	2.02	24.7	2.70		0.68	5.1	
2.5																
3.0	S2	21			3.0					2.03	24.3	2.70		0.75	5.2	
4.0			Greyish sandy silty clay, CI with grits	3.0		3.0										
4.5	S3	23					39.9	20.9	19.0	2.03	24.2	2.70		0.79	5.3	0.128
5.5																
6.0	S4	24			6.0					2.03	24.2	2.70		0.81	5.3	
7.0			Yellowish sandy silty clay, CI with grits	6.0		3.0										
7.5	S5	25					44.9	19.0	25.9	2.04	23.8	2.71		0.83	5.3	
8.5																
9.0	S6	28			9.0					2.04	23.4	2.70		0.89	5.3	
10.0			Yellowish reddish sandy silty clay, CI with grits	9.0		1.5										
10.5	S7	30			10.5					2.05	23.0	2.70		0.93	5.3	

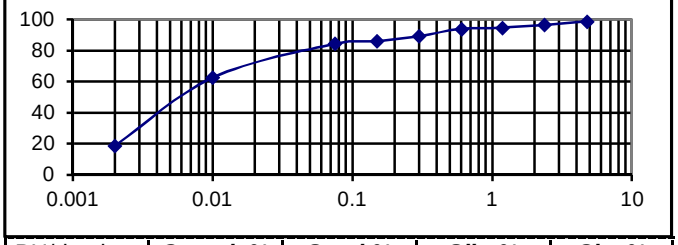
NAME OF WORK : Sub soil Investigation for C/O							BORING FINISH DATE : 23.03.2021					WATER TABLE : 4.20 m bgl.				
Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur							BORING METHOD : Rotary									
BORE HOLE NO. : 2			Site Incharge - Bipul Kumar				TERMINATION DEPTH : 10.5 m					RECORD ON : 23.03.2021				

Depth Below GL (m)	Sample No.	SPT 'N' Value observation	Visual Description of Soil with IS Classification	Depth(m)		Thickness (m)	Liquid Limit	Plastic Limit	Plasticity Indix,%	Bulk Density (gm/cm3)	Natural Moisture Content (%)	Specific Gravity	Shear Test			Compression Index (C_c)
													Type of Test	Cohesion, c (kg/cm2)	Friction Angle, f°	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		3.0										
1.5	S1	14								2.01	25.3	2.70		0.60	5.1	
2.5																
3.0	S2	22			3.0		40.6	19.8	20.8	2.03	24.2	2.70		0.77	5.2	
4.0			Greyish sandy silty clay, CI with grits	3.0		3.0										
4.5	S3	25								2.03	24.2	2.70		0.82	5.3	0.126
5.5																
6.0	S4	27			6.0		40.0	17.9	22.1	2.03	23.5	2.70		0.87	5.3	
7.0			Yellowish sandy silty clay, CI with grits	6.0		4.5										
7.5	S5	30								2.04	22.9	2.70		0.93	5.3	
8.5																
9.0	S6	33					42.2	18.9	23.3	2.05	22.7	2.69		0.99	5.4	
10.0																
10.5	S7	35			10.5											

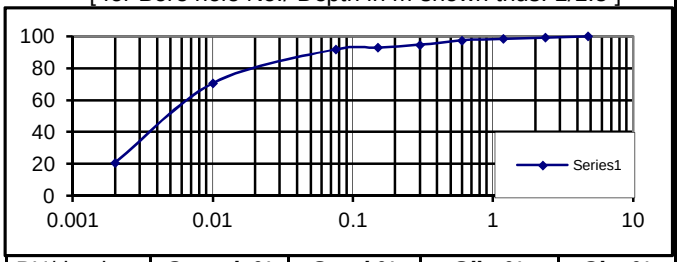
NAME OF WORK : Sub soil Investigation for C/O						BORING FINISH DATE : 24.03.2021					WATER TABLE : 4.30 m bgl.				
Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur						BORING METHOD : Rotary									
BORE HOLE NO. : 3		Site Incharge - Bipul Kumar				TERMINATION DEPTH : 10.5 m					RECORD ON : 24.03.2021				

Depth Below GL (m)	Sample No.	SPT 'N' Value observation	Visual Description of Soil with IS Classification	Depth(m)		Thickness (m)	Liquid Limit	Plastic Limit	Plasticity Indix,%	Bulk Density (gm/cm3)	Natural Moisture Content (%)	Specific Gravity	Shear Test			Compression Index (C_c)
													Type of Test	Cohesion, c (kg/cm2)	Friction Angle, f°	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		3.0										
1.5	S1	15					41.2	21.6	19.6	2.01	24.2	2.70		0.63	5.1	
2.5																
3.0	S2	20			3.0					2.02	24.6	2.69		0.73	5.2	0.131
4.0			Greyish sandy silty clay, CI with grits	3.0		1.5										
4.5	S3	25			4.5		39.3	22.1	17.2	2.03	24.1	2.69		0.83	5.3	
5.5			Yellowish sandy silty clay, CI with grits	4.5		4.5										
6.0	S4	28								2.04	23.3	2.69		0.89	5.3	
7.0																
7.5	S5	30								2.05	22.9	2.70		0.93	5.3	
8.5																
9.0	S6	33			9.0											
10.0			Yellowish reddish sandy silty, CI with grits	9.0		1.5										
10.5	S7	35			10.5		39.2	25.3	13.9							

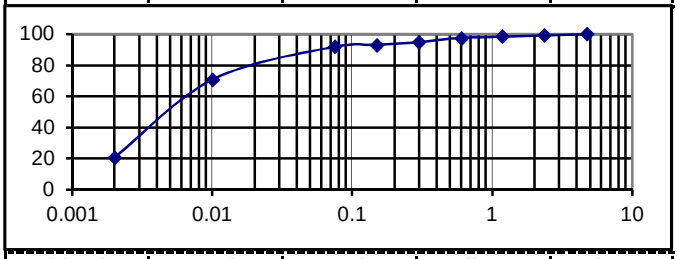
Table 2 [part **B]: Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



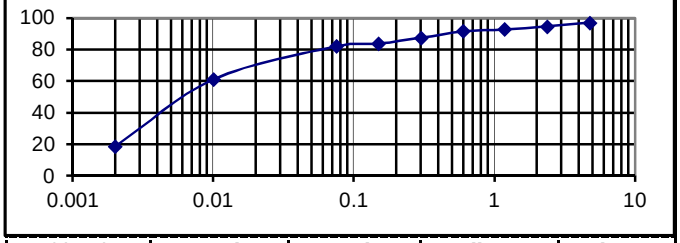
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/1.5	1.3	14.4	65.5	18.8



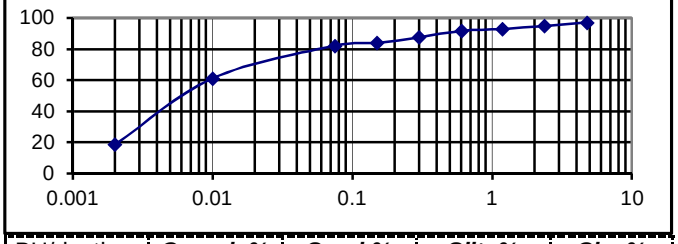
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/3.0	0.0	8.2	71.2	20.6



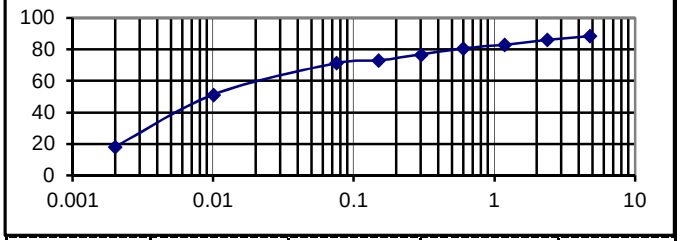
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/4.5	0.0	8.0	71.2	20.8



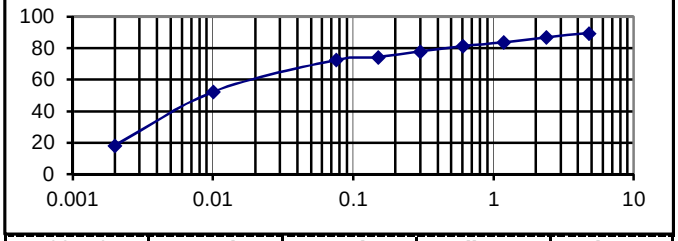
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/6.0	3.0	15.0	63.6	18.5



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/7.5	3.0	15.0	63.5	18.6

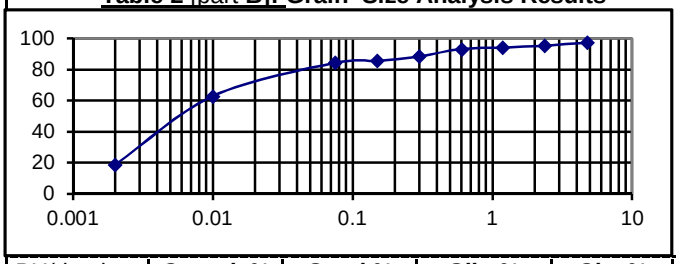


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/9.0	11.4	17.3	53.1	18.2

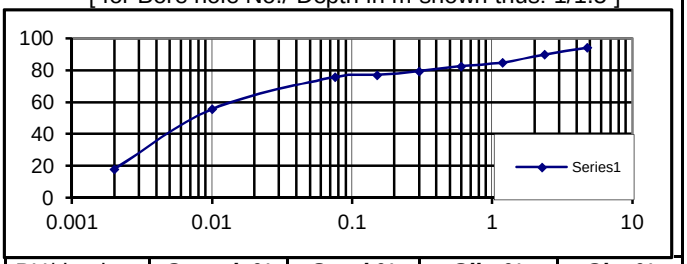


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/10.5	10.5	17.0	54.3	18.3

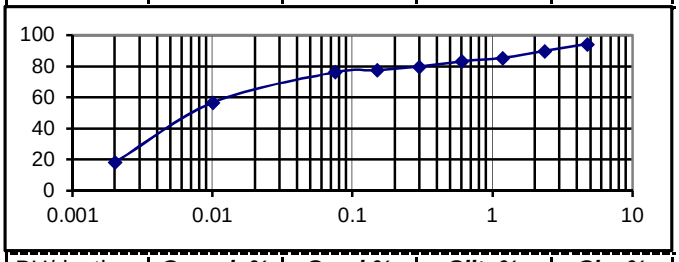
Table 2 [part **B**]: **Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



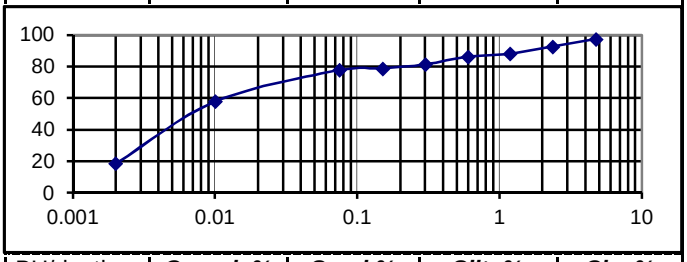
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/1.5	2.8	12.9	65.5	18.8



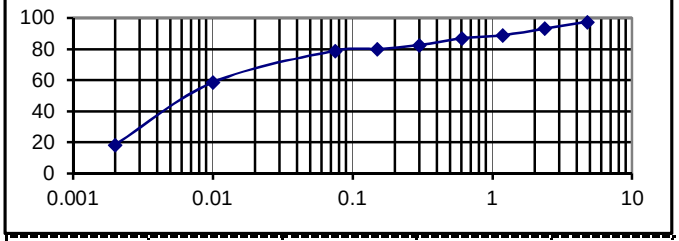
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/3.0	5.8	18.5	57.6	18.1



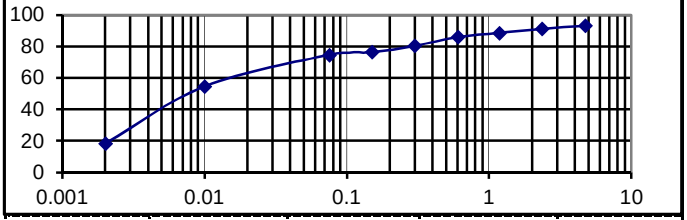
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/4.5	5.8	18.0	58.0	18.2



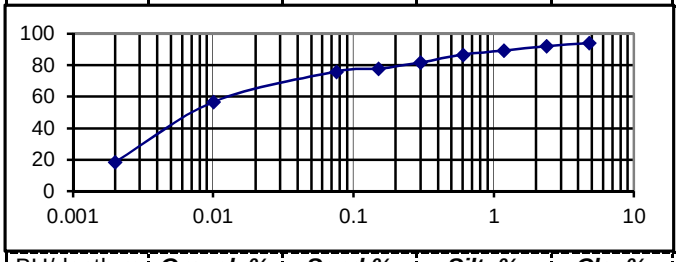
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/6.0	2.5	19.7	59.4	18.4



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/7.5	2.6	18.5	60.5	18.5

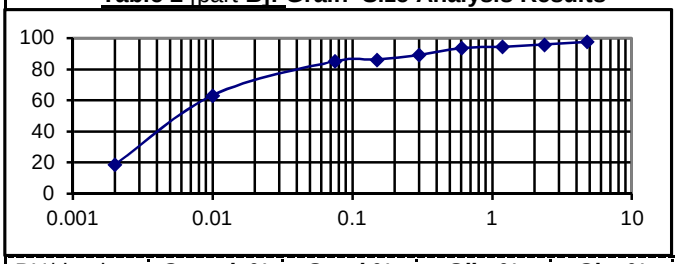


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/9.0	6.8	18.6	56.2	18.3

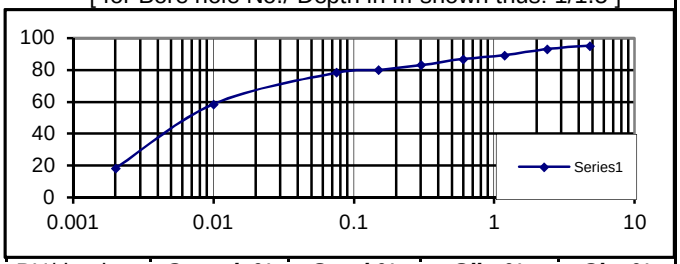


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/10.5	5.9	18.1	57.5	18.5

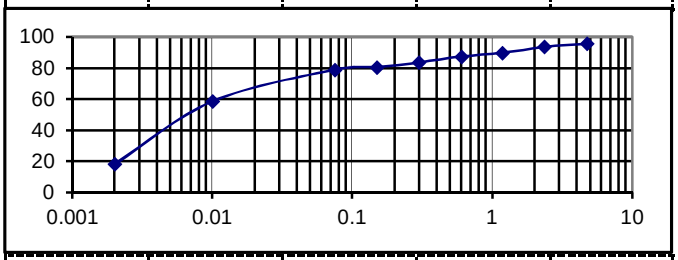
Table 2 [part **B]: Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



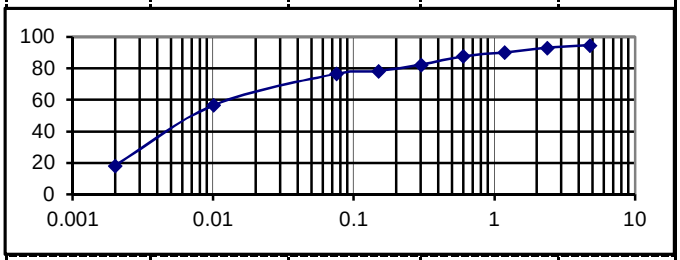
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/1.5	2.3	12.5	66.6	18.6



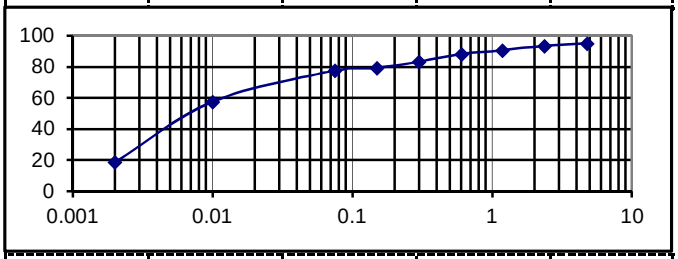
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/3.0	4.8	16.8	60.0	18.4



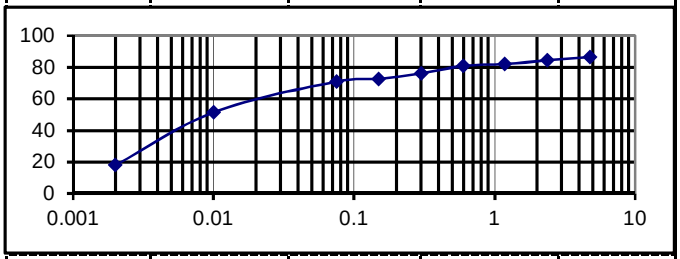
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/4.5	4.4	16.7	60.7	18.2



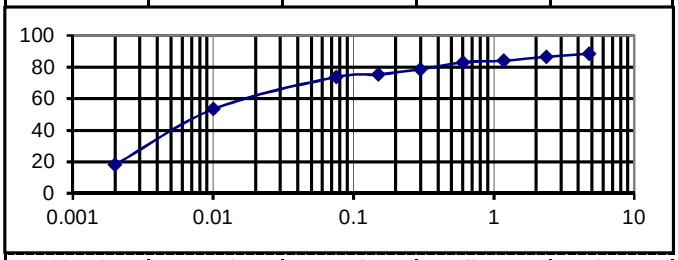
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/6.0	5.4	18.1	58.3	18.3



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/7.5	4.9	17.6	58.9	18.6

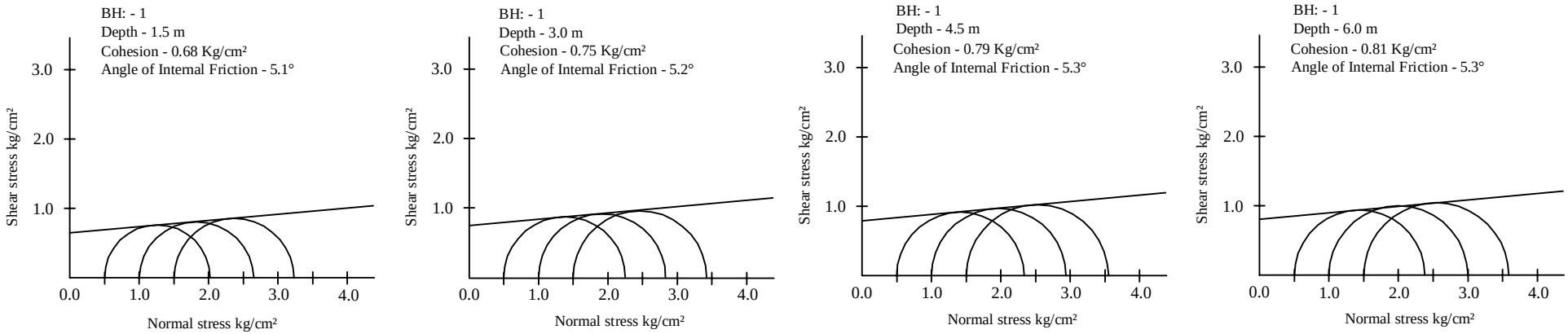


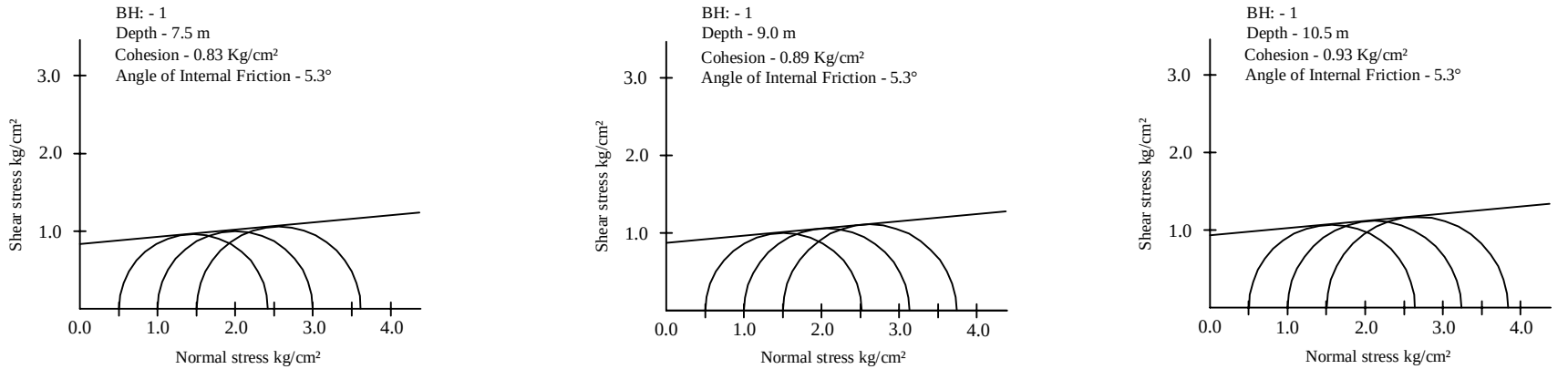
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/9.0	13.4	15.5	53.1	18.0



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/10.5	11.4	14.9	55.7	18.1

TRIAXIAL / DIRECT SHEAR TEST PLOTS





Appendix - D1

Bihar Foundation Consultants,
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]

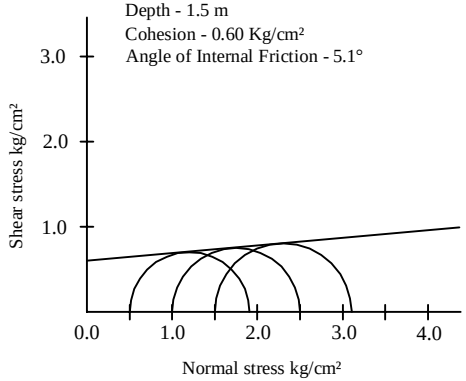
Project No. 210323

For the Proposed

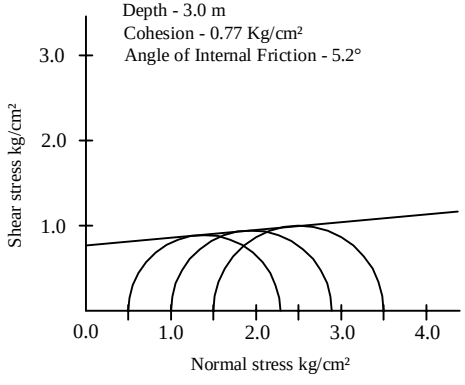
Sarvodya High School at Guriyan,
Block - Nuaon, Dist. Kaimur

TRIAXIAL / DIRECT SHEAR TEST PLOTS

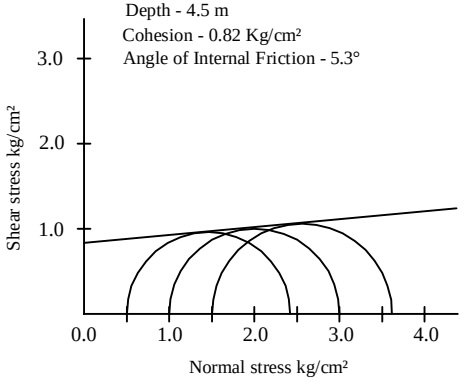
BH: - 2
Depth - 1.5 m
Cohesion - 0.60 Kg/cm²
Angle of Internal Friction - 5.1°



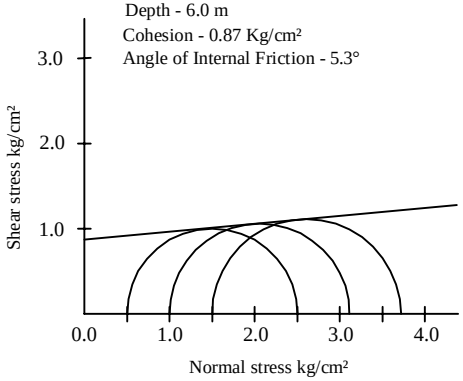
BH: - 2
Depth - 3.0 m
Cohesion - 0.77 Kg/cm²
Angle of Internal Friction - 5.2°



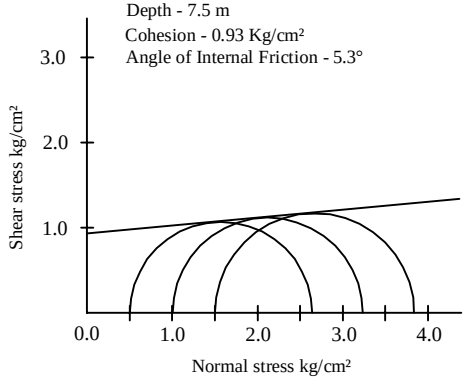
BH: - 2
Depth - 4.5 m
Cohesion - 0.82 Kg/cm²
Angle of Internal Friction - 5.3°



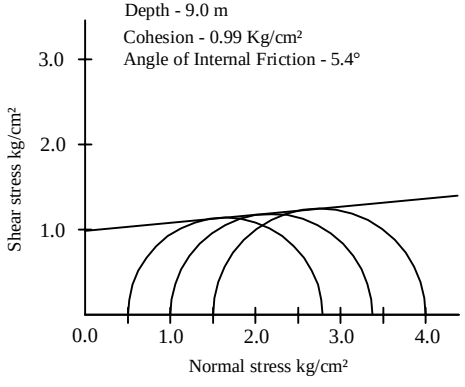
BH: - 2
Depth - 6.0 m
Cohesion - 0.87 Kg/cm²
Angle of Internal Friction - 5.3°



BH: - 2
Depth - 7.5 m
Cohesion - 0.93 Kg/cm²
Angle of Internal Friction - 5.3°



BH: - 3
Depth - 9.0 m
Cohesion - 0.99 Kg/cm²
Angle of Internal Friction - 5.4°



Appendix - D2

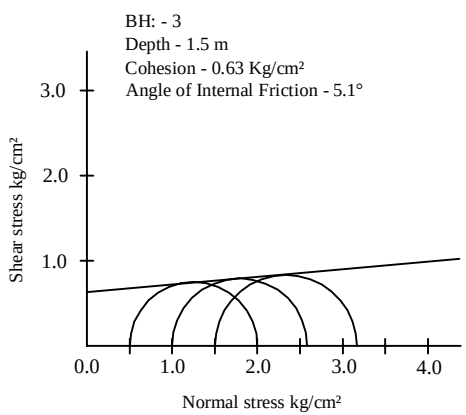
Bihar Foundation Consultants,
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]

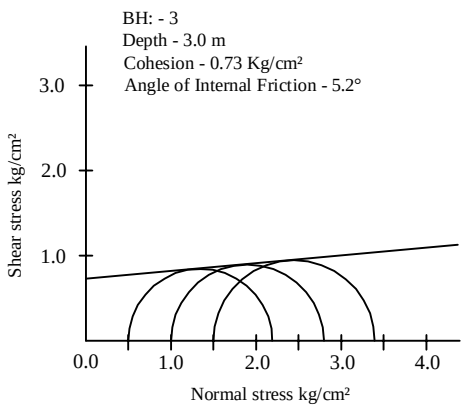
Project No. 210323

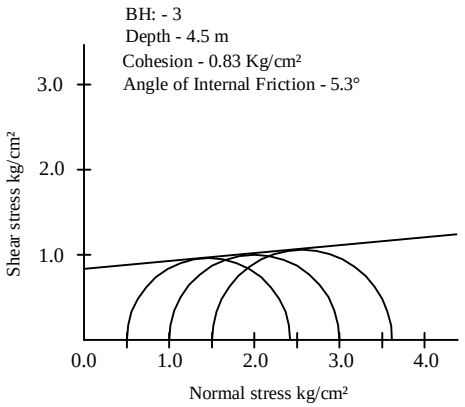
For the Proposed

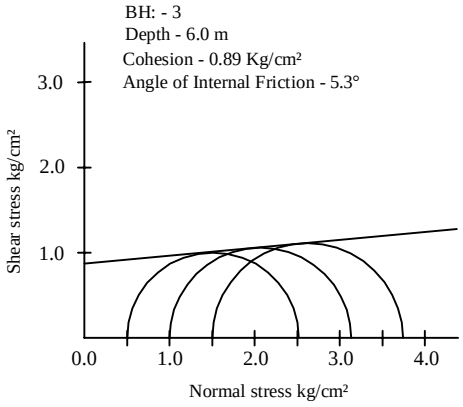
Sarvodya High School at Guriyan,
Block - Nuaon, Dist. Kaimur

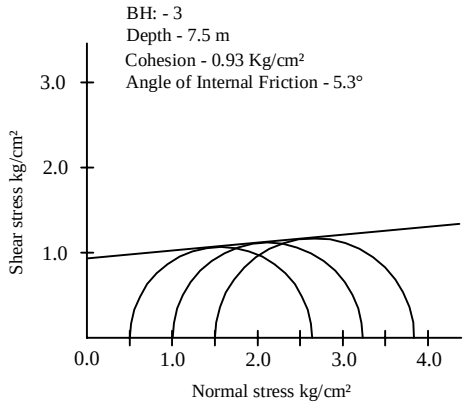
TRIAXIAL / DIRECT SHEAR TEST PLOTS











Appendix - D3

Bihar Foundation Consultants,
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]

Project No. 210323

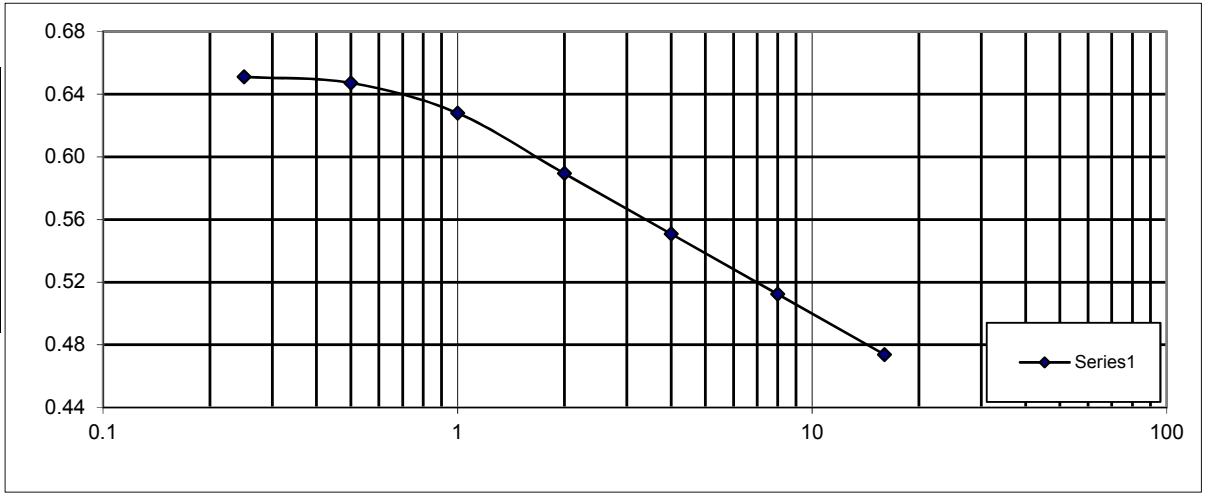
For the Proposed

Sarvodya High School at Guriyan,
Block - Nuaon, Dist. Kaimur

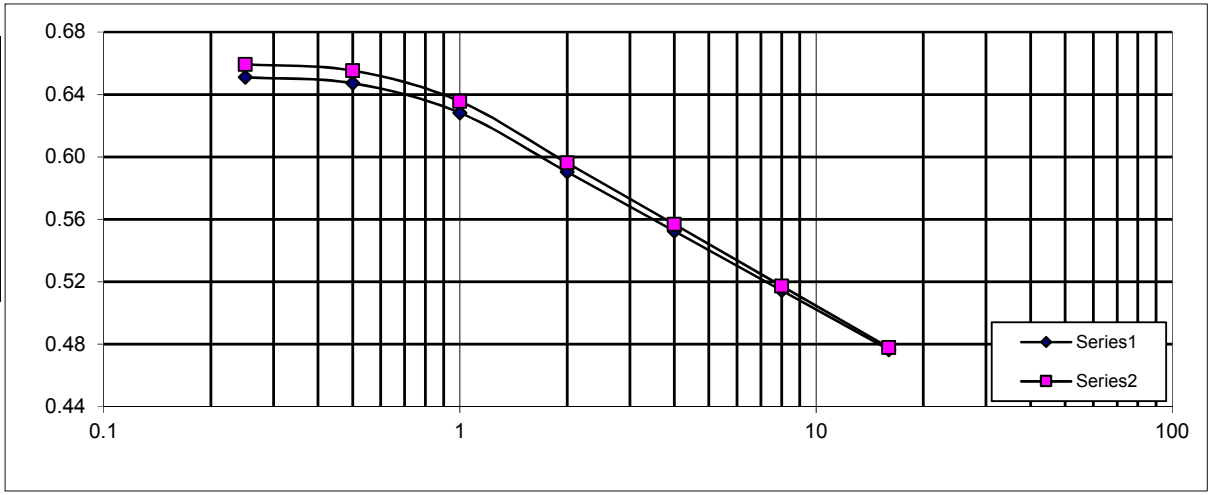
Fig. e - log p Plots from Consolidation Tests

X-axis : Pressure, p (kg/cm^2) on log scale. **Y-axis :** Void ratio, e

BH No./		Initial V.R.	
Depth (m)	**Cc**	e_0	CURVE
1/4.5	0.128	0.6534	Series1



BH No./		Initial V.R.	
Depth (m)	**C_c**	e_0	CURVE
2/4.5	0.126	0.6534	Series1
3/3.0	0.131	0.6617	Series2



SAMPLE CALCULATION OF BEARING CAPACITY OF SHALLOW FOUNDATION

The determination of the **net safe bearing capacity**, q_{ns}, is done on the basis of the shear failure criterion after dividing the value of the **net ultimate bearing capacity** q_{nf}, calculated as described below, by a suitable factor of safety. The **net soil pressure,** q_s, for a given permissible settlement is then calculated as explained in the next section. The lower of the two values, q_{ns} and q_s, thus determined is taken as the **allowable bearing capacity** of the soil.

1. Shear Failure Criterion :

The **net ultimate bearing capacity** q_{nf} (t/m^2) of a shallow foundation of breadth B (m) and depth D (m) is given as per IS:6403-1981 (Sec.5.1.2) by the following equation :

$$q_{nf} = c\,N_c\,s_c\,d_c\,I_c + q\,(N_q - 1)\,s_q\,d_q\,I_q + 0.5\,\gamma\,B\,N_\gamma\,s_\gamma\,d_\gamma\,I_\gamma\,w$$

where c = cohesion (t/m^2)

γ = unit weight of subsoil (t/m^3) [submerged unit weight, γ', is taken where so applicable]

q = effective surcharge (t/m^2) = γD

N_c, N_γ, N_q = bearing capacity factors, which are functions of ϕ, the angle of internal friction of the soil.

s_c, s_q, s_γ = shape factors
d_c, d_q, d_γ = depth factors
I_c, I_q, I_γ = inclination factors
} related to cohesion, surcharge and density of subsoil respectively

w = water table factor (= 0.5 to 1.0) depending on the depth, D_w of water table [vide Table below].

The bearing capacity factors (N's) are functions of ϕ, the angle of internal friction of the soil. The values of these factors are found for general shear failure by referring to standard tables. If subsoil conditions are such as to lead to local shear failure, the values of these factors are found for a reduced value of angle of internal friction (ϕ') given by the equation : $\tan\phi' = 0.67 \tan\phi$. The value of cohesion is also reduced to $c' = 0.67\,c$.

The values of the other factors in the above equation for usual conditions are as tabulated below :

s_c =	1.3	1+0.2B/L	1	d_c =	$1+0.2\,(N\,f)^{0.5}\,D/B$		D_w at	G.L. Fou'dn.Level
s_q =	1.2	1+0.2B/L	1	$d_q = d_\gamma$ =	1	for $f < 10^o$	w =	0.5 1
s_g =	0.8//0.6	1-0.4B/L	1	$d_q = d_\gamma$ =	$1+0.1(N\,f)^{0.5}\,D/B$	$f > 10^o$		Interpolation between
FOR	sq.// O	Rect.	STRIP	I_c, I_q, I_γ = 1 for vertical load				these values is linear.

In the present case, the representative values of cohesion © and angle of internal friction (ϕ) may be obtained from the soil data given earlier. Full submergence of the soil has been assumed. The **safe bearing capacity**, q_{ns} has been obtained by dividing q_{nf} by a **safety factor, 3**.

One example of calculation of safe bearing capacity for a certain shape, depth and width of a footing is given in **Table A** on the next page. The net safe bearing capacity for the footing is entered in the last column of Table A. Calculations for other depths and widths of footings are done similarly.

The value of net safe bearing capacity (q_{ns}) calculated for each set of values of B and D is used for calculating the consolidation settlement s as explained in Sec. 2 below.

2. Settlement Criterion for Foundation on cohesive soil.

As per IS:8009(Part I)-1976, Sec. 9.2.2.2, the settlement s (in mm) is given by the equation :

$$s = [1000\,H\,C_c\,\log\,(1 + \Delta p/p_o)] / (1 + e_o)\,\lambda$$

where H = thickness (in m) of the compressible layer

C_c = compression index of the soil

e_o = initial void ratio at mid-height of compressible soil layer = its m/c (m) x sp. Gravity

p_o = initial effective pressure at mid-height of the layer (t/m^2)

Δp = pressure increment at the mid-height of the layer due to the foundation (t/m^2).

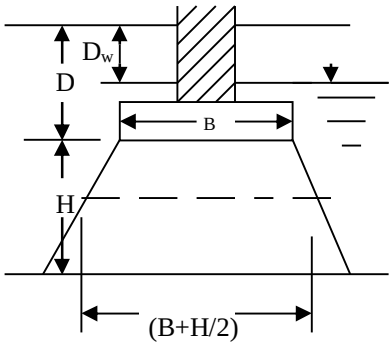
λ = correction factor

If there are different layers with different compression indices and void ratios, s is calculated for each one of these and then added together to get the settlement.

The pressure increment at any plane due to the footing load may be calculated by assuming the dispersion of load at a slope of 1 horizontal to 2 vertical. Hence the load applied over a width B of a foundation (vide the Fig. below) is spread at a depth H/2 below it over a width (B + H/2).

A correction factor $\lambda = 0.80$ is used as per IS Code to find the corrected settlement. If this value of corrected s is within the permissible limit specified in the Code, the corresponding value of q_{ns} is also the net allowable bearing capacity q_{na}. If not, trials give the desirued value of q_{na} . One example of this settlement analysis is given below the **Table B** in Sec. 3.

If $D_w > (D+ 1.5\ B/2)$, $p_o = \gamma\ (D+1.5\ B/2)$ t/m^2, otherwise, $p_o = \gamma\ D_w + (\gamma - 1)(D- D_w + H/2)$ t/m^2



D_w = depth of water table below ground level .
D = depth of foundation
B = breadth of foundation
H = 1.5 x B = thickness of compressible soil layer in the zone of influence of the loaded foundation.
Breadth of the influence zone at the mid-plane of the compressible layer, of thickness H = (B + H/2).
In case of a rectangular or square footing a similar dispersion of load takes place along the other side of footing.

3. SAMPLE CALCULATION

Table A **Calculation of Net Safe Bearing Capacity**

Shape of Foundation: STRIP			F.S.= 3	γ, t/m^3= 2.01		c =	ϕ =	Nc =	Nq =	Nγ =
						6	5.1	6.52	1.58	0.46
D [m]	B [m]	dc	dq = dg	c	q	I Term	II Term	III Term	qnf	qnf /F
1.5	2	1.16	1	6	1.508	45.55	0.88	0.46	46.89	15.63

The net safe bearing capacity for the footing is to be seen in the last column of the above Table A. This value is checked for settlement as shown below.

Table B **Calculation of Settlement**

m = 0.253		Gs = 2.7		eo = 0.6831		Cc = 0.131		Dw = 0	
Depth D [m]	Width B [m]	qnf /F t/m^2	po t/m^2	H m	Dp t/m^2	log (1+ Dp/po)	s [mm] mm	λs mm mm	Remarks
1.5	2.0	15.6	3.0	3.0	8.9	0.6	139.2	111.3	Not OK
1.5	2.0	8.0	3.0	3.0	4.6	0.4	93.3	74.6	OK

Hence the **net allowable bearing pressure** for a strip footing of width 2.0 m and depth 1.5 m below ground level will be 8.0 t/m^2.

The calculations for footings of other sizes and depths are done similarly

बिहार राज्य शैक्षणिक आधारभूत संरचना विकास निगम लिमिटेड
BIHAR STATE EDUCATIONAL INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

BSEIDC

(A Govt. of Bihar Undertaking)
ISO 9001:14001; OHSAS 18001

Shiksha Bhawan, Bihar Rashtrabhasha Parishad Campus, Acharya Shivpujan Sahay Path, Saidpur, Patna - 800 004
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E-mail : bseidc@gmail.com • Website : http://www.bseidc.in • CIN : U80301BR2010SGC015859

पत्रांकः— BSEIDC / TECH / 1960 / 2018 — 1369 दिनांक 02.03.2024

प्रेषक,

मुख्य अभियंता
BSEIDC Ltd, Patna

सेवा में,

बिहार फाउंडेशन कंसल्टेन्ट
गंगा दर्शन अपार्टमेंट, फ्लैट नं०—403
सदाकत आश्रम के पश्चिम,
पटना— 800010

विषयः— **निर्माण स्थल के मिट्टी जाँच हेतु।**

प्रसंगः— भवन निर्माण विभाग का पत्र संख्या—2030, दिनांक—21.04.2006

महाशय,

बिहार राज्य शैक्षणिक आधारभूत संरचना विकास निगम लि० के अधीन **"जहानाबाद, अरवल, नवादा, रोहतास, कैमुर, मुंगेर, सुपौल, वैशाली, सारण, भागलपुर और दरभंगा "** में विभिन्न +2 स्तरीय विद्यालय भवनों का निर्माण कार्य प्रस्तावित है। इन भवनों के निर्माण स्थलों पर मिट्टी की जाँच कराना है, जिसकी सूची (क्रम सं0—1 से 23 एवं 25 से 26 कुल 25)संलग्न है।

अतः अनुरोध है कि उपरोक्त स्थलों का तीन—तीन बिन्दुओं पर 10.5 मीटर गहराई तक प्रत्येक 1.5 मीटर गहराई में मिट्टी का नमूना संग्रह कर प्रतिवेदन समर्पित करें। साथ ही विहित प्रपत्र में मिट्टी के भार वहन क्षमता की गणना (Isolated एवं Pile Foundation के लिए अलग—अलग) भी Hard Copy एवं Soft Copy में समर्पित करें।

इस जाँच कार्य को इस तरह संपादित करें कि ट्रान्सपोर्टेशन एवं मोबलाईजेशन खर्च कम से कम हो। कार्य स्थलों पर सम्पर्क व्यक्ति, कार्य से संबंधित प्राचार्य / संबंधित कार्यपालक अभियंता रहेंगे।

विश्वासभाजन

13/3/24

मुख्य अभियंता

Sarvodya High School at Guriyan, Block - Nuaon, Dist. Kaimur

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Bihar State Educational Infrastrucure Development Corporation Ltd.

List of Schools for Soil Test

Sl.No.	District	Block	Name of Vidyalay	Letter no. & Date of A/A	Name & Mobile no of Executive Engineer
1	Jehanabad	Ratni Faridpur	High School, Rakasiya Dyaichak	11/भवन 08-02/2018-176 dt. 26.02.2020	Sri Binod Ranjan, 9661863636
2	Arwal	Kurtha	Govt. High School, Kurtha		Sri Binod Ranjan, 9661863636
3	Nawada	Hisua	High School, Pacharha		Sri Binod Ranjan, 9661863636
4	Rohtas	Chenari	Gangotri Project High School, Chenari	11/वि.-11-48/2018 - 207 dt. 18.03.2020	Sri Ranvijay Kumar Sinha, 9934961293
5	Kaimur	Durgawati	High School, Dhanechha	11/भवन 08-01/2017-217 dt. 20.03.2020	Sri Ranvijay Kumar Sinha, 9934961293
6	Kaimur	Durgawati	Shatruharan High School, Kalyanpur		Sri Ranvijay Kumar Sinha, 9934961293
7	Kaimur	Ramgarh	High School, Ramgarh		Sri Ranvijay Kumar Sinha, 9934961293
8	Kaimur	Ramgarh	High School Rajendranagar, Deohaliya		Sri Ranvijay Kumar Sinha, 9934961293
9	Kaimur	Nuaon	Ramayan singh High School, Banka Bahuaara		Sri Ranvijay Kumar Sinha, 9934961293
10	Kaimur	Nuaon	Sarvodya High School, Guriyan		Sri Ranvijay Kumar Sinha, 9934961293
11	Supaul	Chhatapur	Govt. Lalit Narayan Vidya Mandir, Balua Bazar		Sri Satish Prasad, 9523226037
12	Munger	Dharhara	Bapu Peaveshika High School, Sundarpur	11/वि.-11-05/2019 - 219 dt. 20.03.2020 and 11/वि.-11-05/2019 -118 dt. 18.02.2021	Sri Surendra Kumar, 7903912972
13	Munger	Khargpur	Gandhi Memorial High School, Muzaffarganj		Sri Surendra Kumar, 7903912972
14	Munger	Khargpur	Inter High School, Lohachi		Sri Surendra Kumar, 7903912972
15	Munger	Jamalpur	Sardar Patel High School, Hanspuri		Sri Surendra Kumar, 7903912972