PN – 211222

REPORT ON

GEOTECHNICAL INVESTIGATIONS

FOR THE PROPOSED

N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

Your Letter No.- BSEIDC/Tech/1960 (P)/2018-7919 Dated – 22.11.2021
[SL. No. – 3]

Submitted to
The Chief Engineer
BSEIDC, Patna

December, 2021

BIHAR FOUNDATION CONSULTANTS
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]
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N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

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[A Unit : Baidyanath Foundation Consultants Pvt. Ltd.]

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Appendix

[Containing Figures and Tables]

1. INTRODUCTION

The subsoil investigations reported herein were taken up (vide W.O. No. BSEIDC/Tech/1960(P)/2018-7919 Dated – 22.11.2020 [SL. No. 3] 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 3-4** of this Report.

2. FIELD WORK

The fieldwork could not be started in June 2020 as the site was waterlogged. This was reported by us to the clients, who asked us to wait for further orders. We were telephonically informed by them in Nov. 2021 to start the work at a new site selected by them. We did accordingly.

The fieldwork consisted of sinking bore holes, collecting soil samples and conducting the necessary field tests.

2.1. Boring

Taking guidance from IS: 1892, 150 mm diameter bore holes were sunk at locations 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 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) Other tests as and when required.

4. PRESENTATION OF TEST RESULTS

The field and laboratory test 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 sub soil in all 3 BH's is sandy silty clay [type CI/CL] up to the depth of about 9.0 m in BH 1 and 6.0 m in BH 2 and 3. Then follows clayey silty sand [type SC-SM] up to the investigated depth of 10.5 m bgl. It is also gritty from about 1.5 m to 6.0 m depth and weathered rock below 6 m.

Ground water table was struck at about 4.40 m to 4.50 m depth below GL in December, 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 sub soil in all 3 BH's is sandy silty clay [type CI/CL] up to the depth of about 9.0 m in BH 1 and 6.0 m in BH 2 and 3 then follow clayey silty sand [type SC-SM] up to the investigated depth of 10.5 m bgl. It is also gritty from about 1.5 m to 6.0 m depth and weathered rock below 6 m.

Ground water table was struck at about 4.40 m to 4.50 m depth below GL in December, 2021. It is subject to seasonal variations.

Considering the above facts,

1. The proposed structure may be provided with shallow foundation at a depth of 1.5 m or more.
2. The lower formation is very hard in which placement of bored cast in situ piles may be difficult. Hence they are not being recommended in the present case. Driven piles may be uneconomical.

The values of net allowable bearing pressures of foundations of certain sizes 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)	Width (m)	Net allowable bearing pressure (t/m²) for			Maximum expected settlement (mm)
		Strip footing	Square footing	Raft footing	
1.5	2.0	8.1	13.7	…	75
	3.0	5.6	9.9	…	75
	10.0	…	…	7.8	100
2.0	2.0	9.6	16.8	…	75
	3.0	6.5	11.4	…	75
	10.0	…	…	8.3	100
2.5	2.0	11.1	19.4	…	75
	3.0	7.3	12.9	…	75
	10.0	…	…	8.8	100
3.0	2.0	12.5	20.0	…	75
	3.0	8.1	14.3	…	75
	10.0	…	…	9.3	100
3.5	2.0	14.1	20.0	…	75
	3.0	9.0	15.9	…	75
	10.0	…	…	9.9	100
4.0	2.0	15.6	20.0	…	75
	3.0	9.9	17.3	…	75
	10.0	…	…	10.4	100

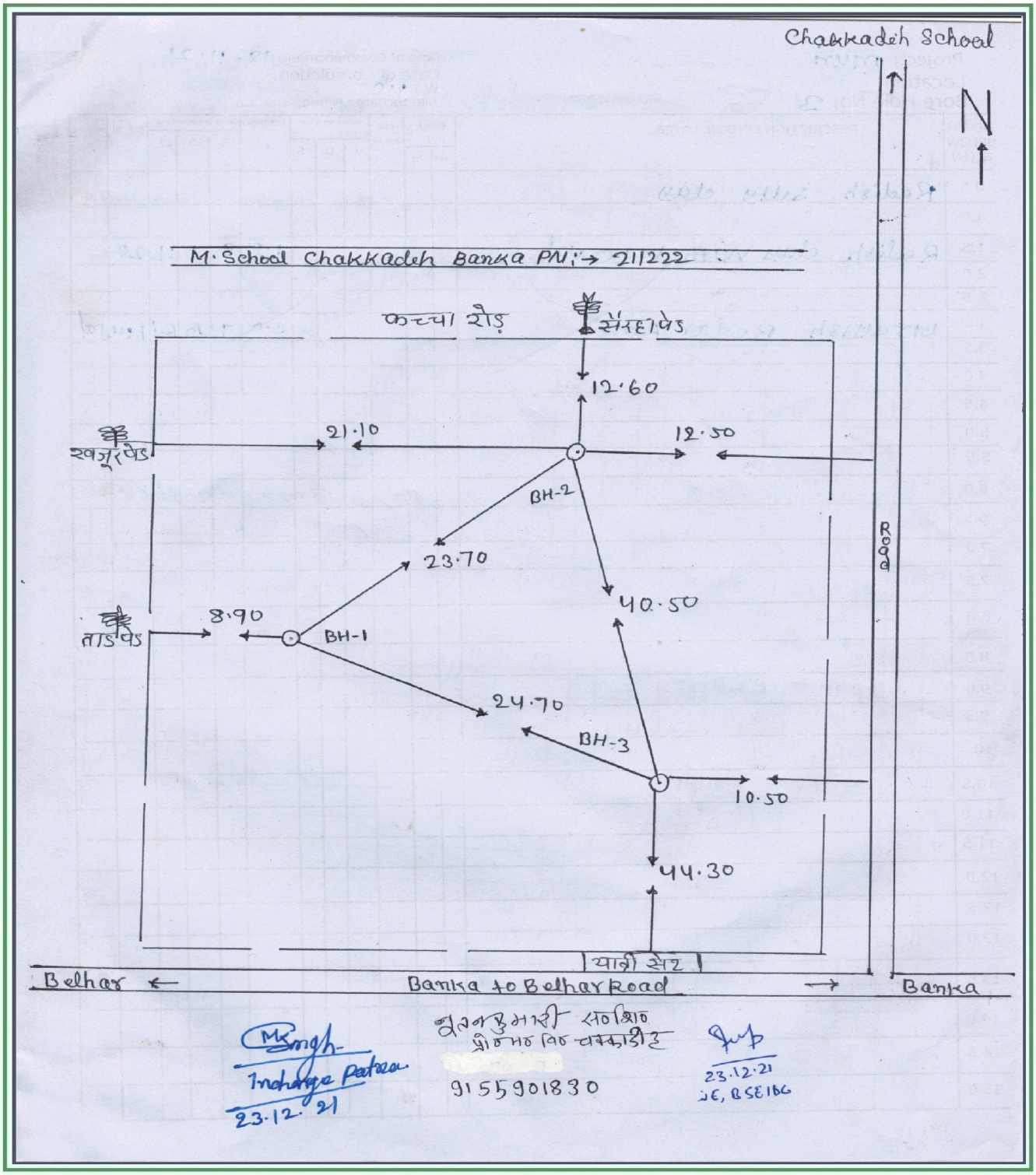
Note:

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.

N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka



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PN - 211222 **Appendix - A**

NAME OF WORK : Sub soil Investigation for C/O							BORING FINISH DATE : 23.12.2021					WATER TABLE : 4.50 m bgl				
N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka							BORING METHOD : Rotary									
BORE HOLE NO. : 1			Site Incharge - Mukesh Singh				TERMINATION DEPTH : 10.5 m					RECORD ON : 23.12.2021				

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, ϕ °	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		1.5										
1.5	S1	10			1.5		37.7	24.4	13.3	2.00	26.0	2.70		0.48	5.0	
2.5			Yellowish greyish sandy silty clay, CL with grits	1.5		4.5										
3.0	S2	23								2.03	24.2	2.70		0.79	5.3	
4.0																
4.5	S3	33					33.1	22.5	10.6	2.05	22.8	2.70		0.99	5.4	0.117
5.5																
6.0	S4	38			6.0					2.06	22.4	2.70		1.09	5.4	
7.0			Yellowish greyish sandy silty clay, CI weathered rock	6.0		3.0										
7.5	S5	50					43.6	22.9	20.7	2.09	20.8	2.70		1.33	5.5	
8.5																
9.0	S6	72			9.0					2.11	19.0	2.70		1.75	5.6	
10.0			Yellowish greyish clayey silty sand, SC-SM weathered rock	9.0		1.5										
10.5	S7	50+			10.5					1.84	35.7	2.63		0.00	32.6	

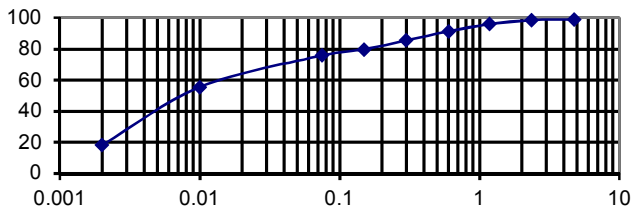
NAME OF WORK : Sub soil Investigation for C/O							BORING FINISH DATE : 23.12.2021					WATER TABLE : 4.40 m bgl				
N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka							BORING METHOD : Rotary									
BORE HOLE NO. : 2			Site Incharge - Mukesh Singh				TERMINATION DEPTH : 10.5 m					RECORD ON : 23.12.2021				

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, ϕ °	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		1.5										
1.5	S1	9			1.5					1.99	26.6	2.70		0.44	5.0	
2.5			Yellowish greyish sandy silty clay, CI with grits	1.5		4.5										
3.0	S2	20					42.5	20.5	22.0	2.02	24.6	2.69		0.73	5.2	
4.0																
4.5	S3	28								2.04	23.4	2.70		0.89	5.3	
5.5																
6.0	S4	35			6.0		37.6	17.9	19.7	2.06	22.5	2.70		1.03	5.4	
7.0			Yellowish greyish clayey silty sand, SC-SM weathered rock	6.0		4.5										
7.5	S5	46								1.84	35.7	2.63		0.00	31.8	
8.5																
9.0	S6	62								1.84	35.9	2.64		0.00	32.8	
10.0																
10.5	S7	50+			10.5					1.84	35.8	2.64		0.00	32.7	

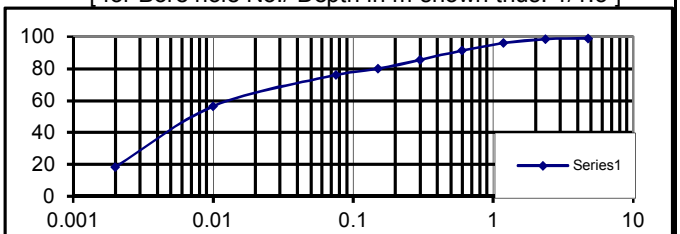
NAME OF WORK : Sub soil Investigation for C/O							BORING FINISH DATE : 24.12.2021					WATER TABLE : 4.50 m bgl				
N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka							BORING METHOD : Rotary									
BORE HOLE NO. : 3			Site Incharge - Mukesh Singh				TERMINATION DEPTH : 10.5 m					RECORD ON : 24.12.2021				

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, ϕ °	
		Obsr.		from	to											
1.0			Greyish sandy silty clay, CI	0.0		1.5										
1.5	S1	10			1.5		38.5	23.9	14.6	2.00	26.0	2.70		48.00	5.0	
2.5			Yellowish greyish sandy silty clay, CI with grits	1.5		4.5										
3.0	S2	22								2.03	24.3	2.70		0.77	5.2	
4.0																
4.5	S3	32					39.1	23.0	16.1	2.05	22.8	2.70		0.97	5.3	
5.5																
6.0	S4	36			6.0					2.06	22.4	2.70		1.05	5.4	
7.0			Yellowish greyish clayey silty sand, SC-SM weathered rock	6.0		4.5										
7.5	S5	45								1.84	35.7	2.63		0.00	31.7	
8.5																
9.0	S6	65								1.84	35.8	2.64		0.00	32.9	
10.0																
10.5	S7	50+			10.5					1.84	35.8	2.64		0.00	32.8	

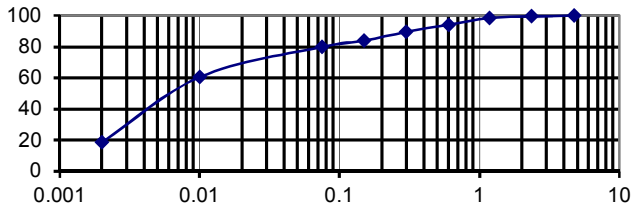
Table 2 [part **B]: Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



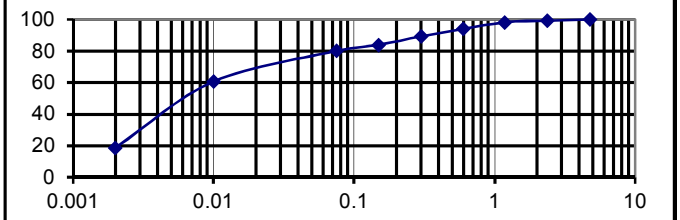
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/1.5	0.9	23.2	57.7	18.2



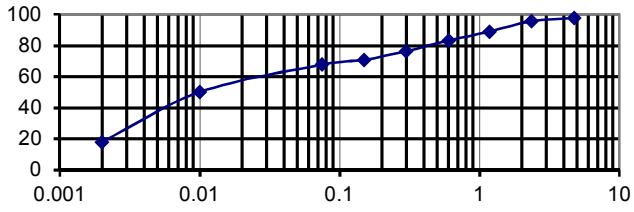
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/3.0	0.9	23.0	57.7	18.4



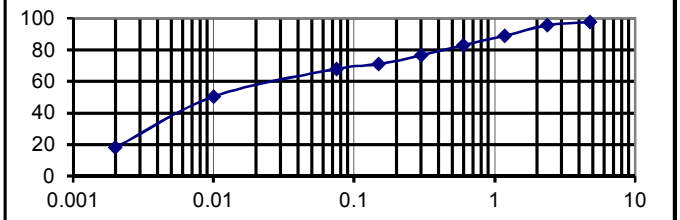
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/4.5	0.0	20.0	61.4	18.6



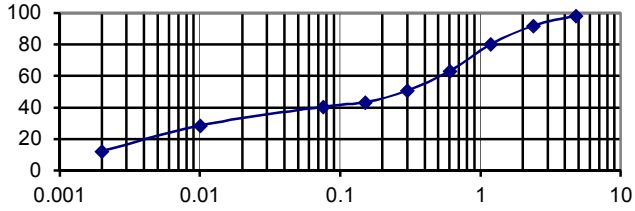
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/6.0	0.0	19.9	61.4	18.7



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/7.5	2.2	30.0	49.8	18.0

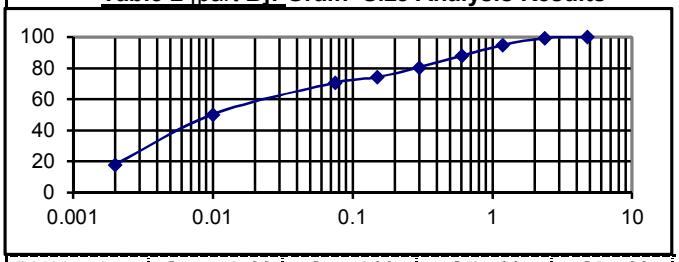


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/9.0	2.2	29.8	49.9	18.1

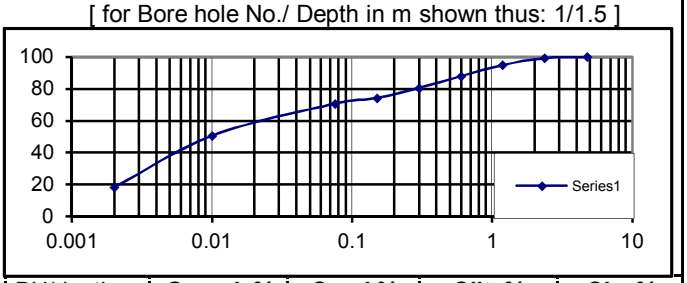


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
1/10.5	1.7	57.8	28.3	12.2

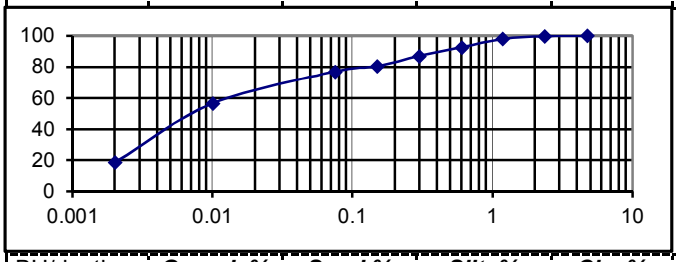
Table 2 [part **B]: Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



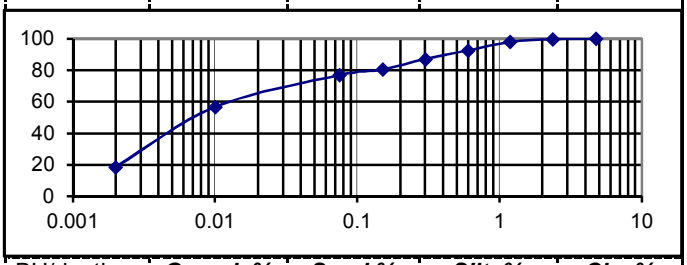
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/1.5	0.0	29.4	52.5	18.1



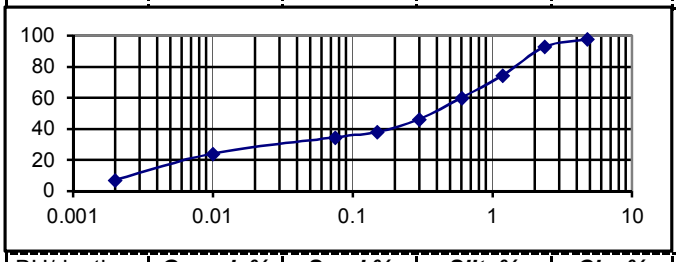
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/3.0	0.0	29.3	52.4	18.3



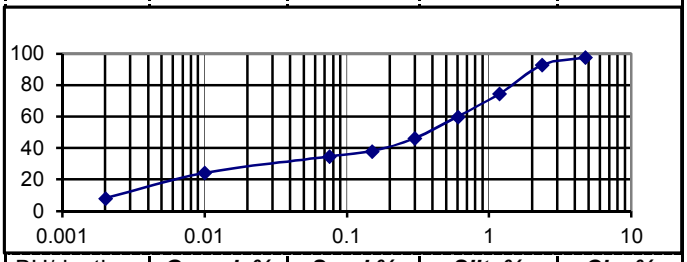
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/4.5	0.0	23.2	58.2	18.6



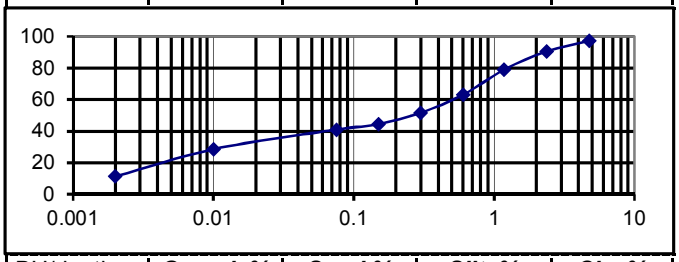
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/6.0	0.0	23.0	58.3	18.7



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/7.5	2.4	62.9	27.4	7.2

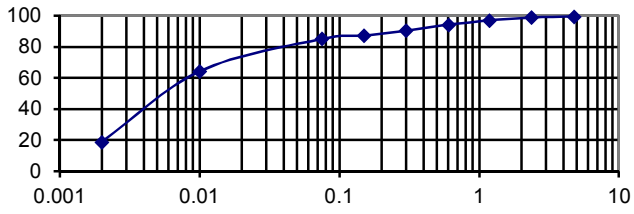


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/9.0	2.5	63.0	26.3	8.2

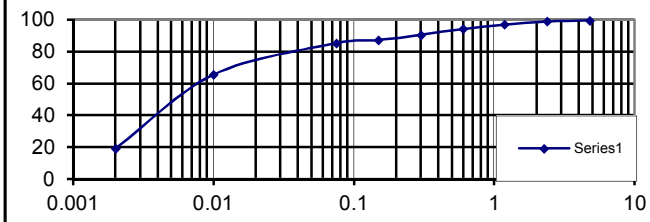


BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
2/10.5	2.6	56.4	29.8	11.2

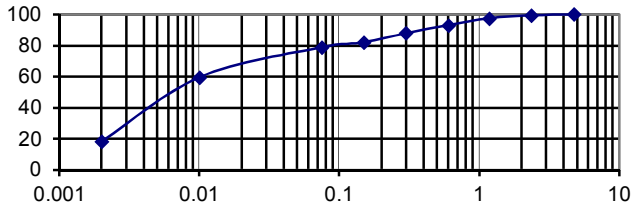
Table 2 [part **B]: Grain Size Analysis Results** [for Bore hole No./ Depth in m shown thus: 1/1.5]



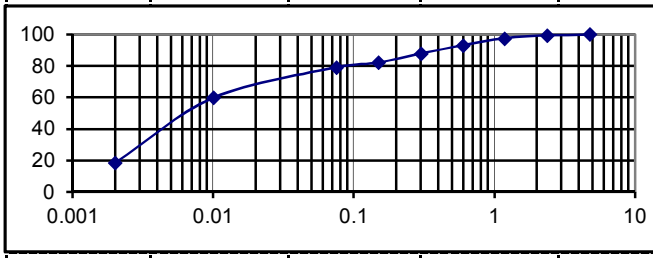
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/1.5	0.5	14.4	66.2	18.9



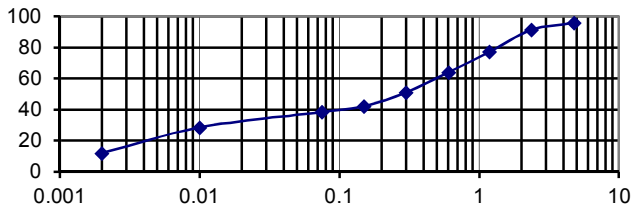
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/3.0	0.5	14.3	66.2	19.0



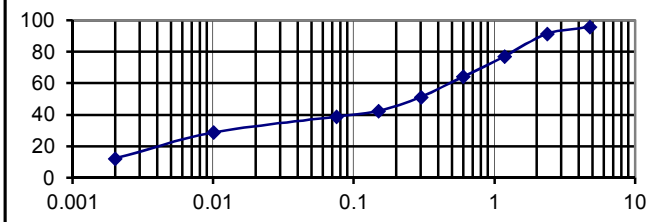
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/4.5	0.0	21.0	60.6	18.4



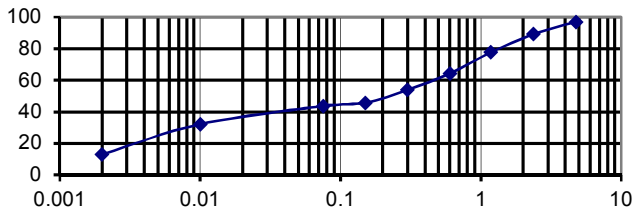
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/6.0	0.0	20.9	60.6	18.5



BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/7.5	4.2	57.3	26.5	12.0

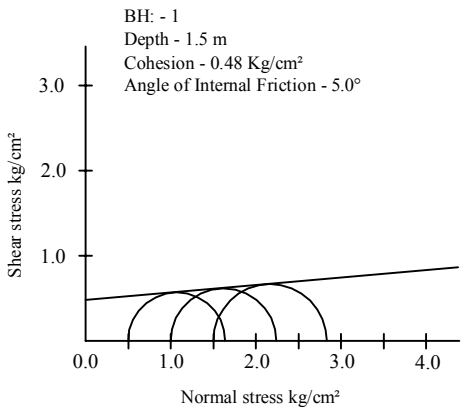


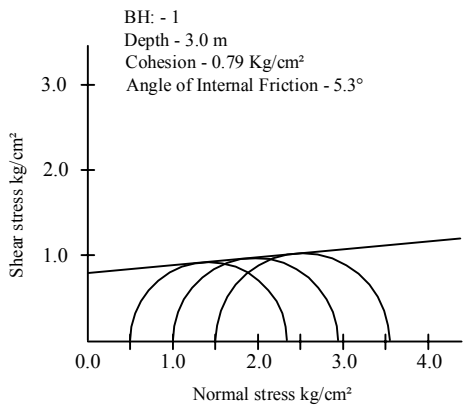
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/9.0	4.2	57.0	26.6	12.2

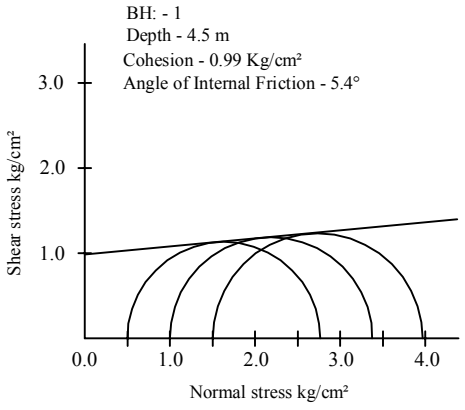


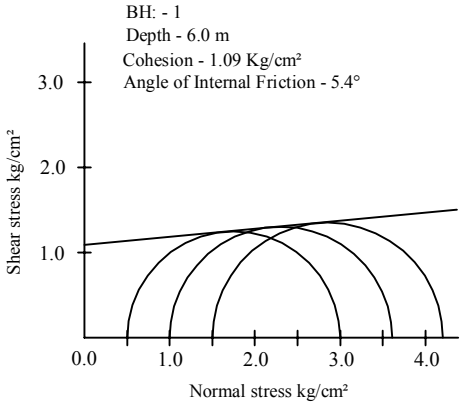
BH/depth,m	*Gravel, %*	*Sand,%*	*Silt, %*	*Clay%*
3/10.5	2.9	53.4	30.6	13.1

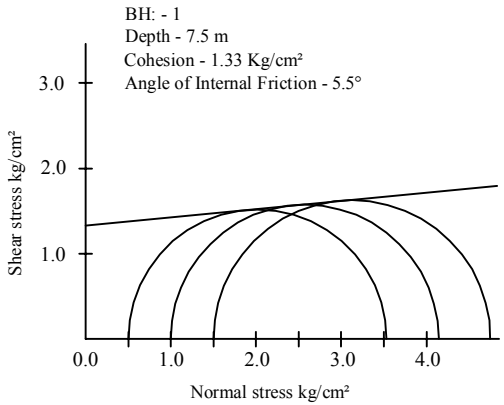
TRIAXIAL / DIRECT SHEAR TEST PLOTS

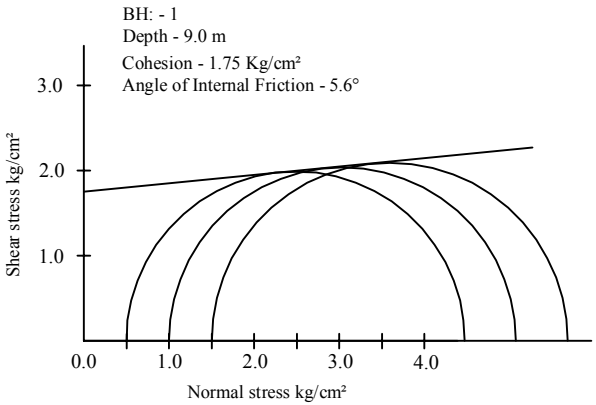


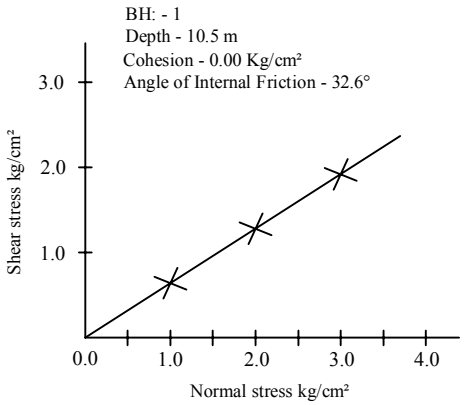












Appendix - D1

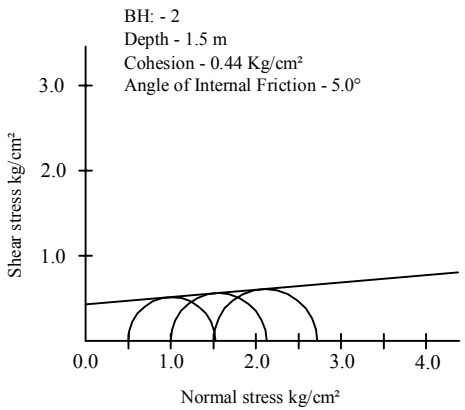
Bihar Foundation Consultants,
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]

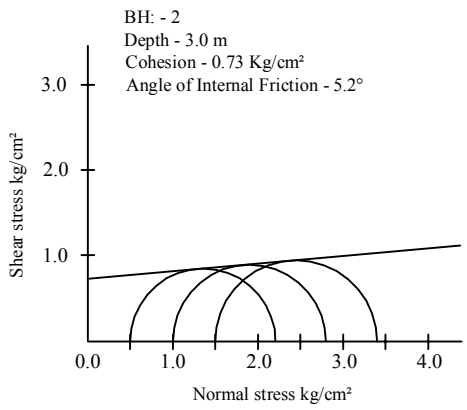
Project No. 211222

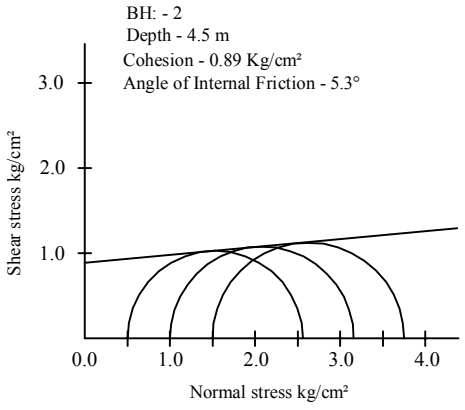
For the Proposed

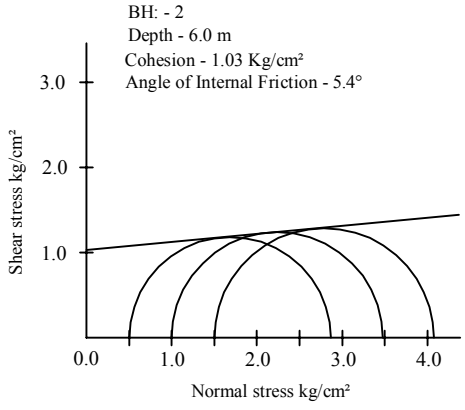
N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

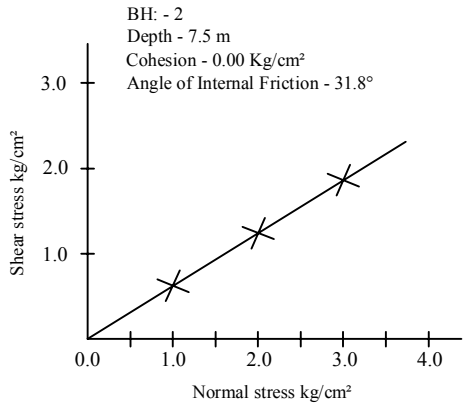
TRIAXIAL / DIRECT SHEAR TEST PLOTS

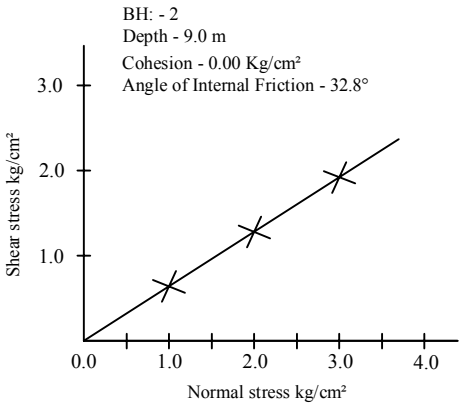


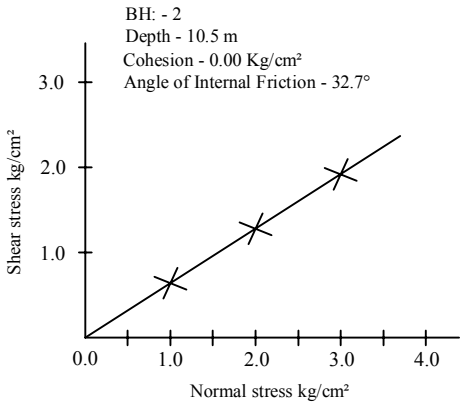












Appendix - D2

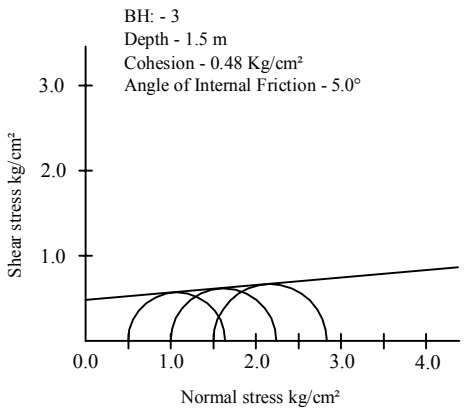
Bihar Foundation Consultants,
[A unit of Baidyanath Foundation Consultants Pvt. Ltd.]

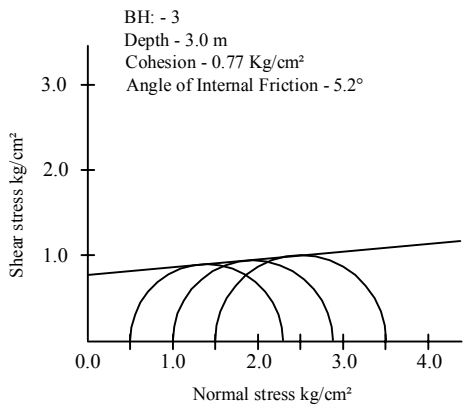
Project No. 211222

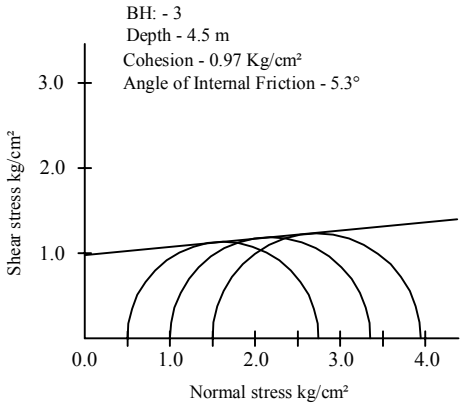
For the Proposed

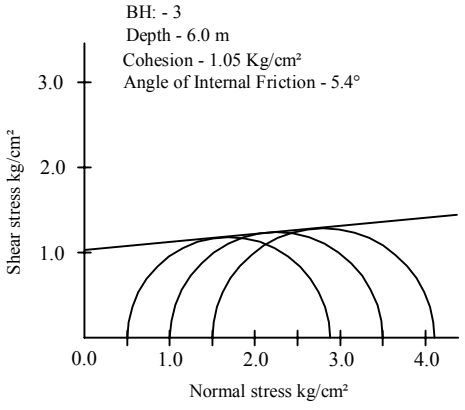
N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

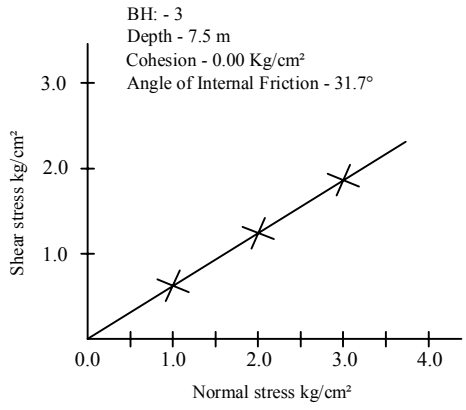
TRIAXIAL / DIRECT SHEAR TEST PLOTS

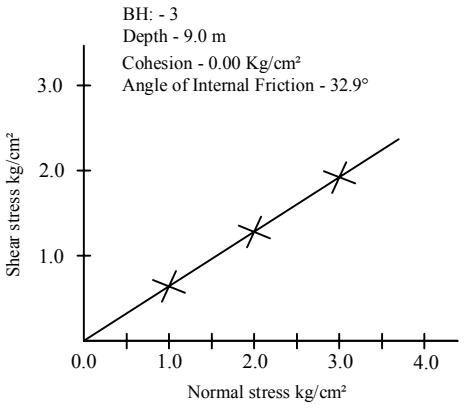


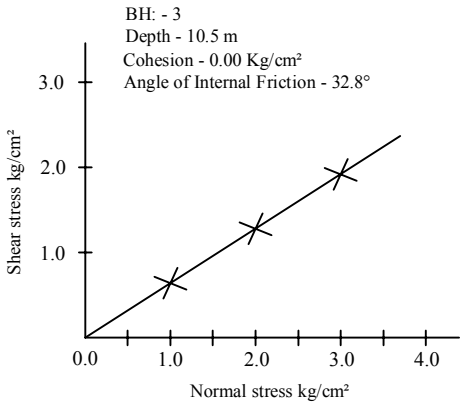












Appendix - D3

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

Project No. 211222

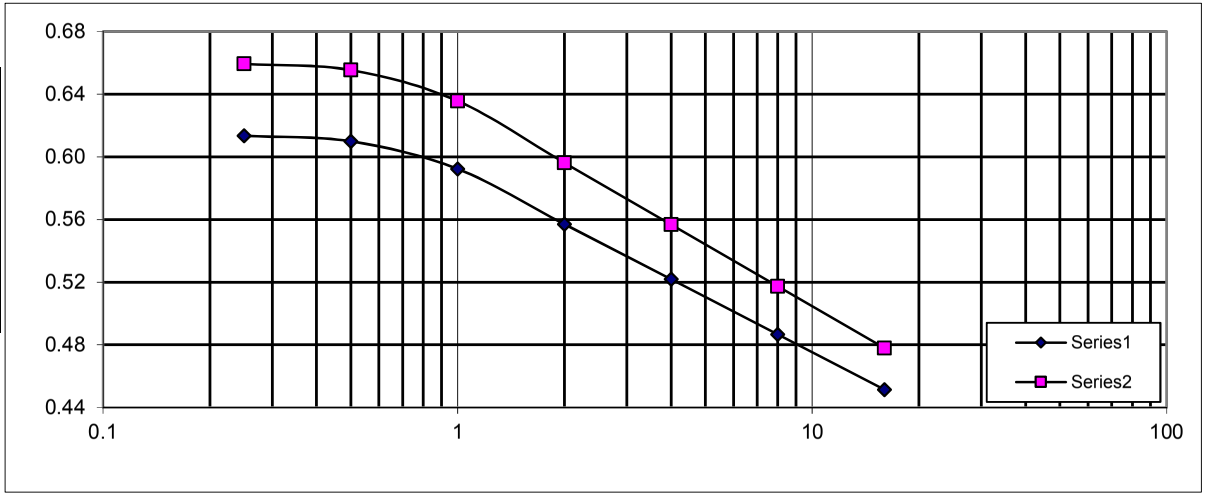
For the Proposed

N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

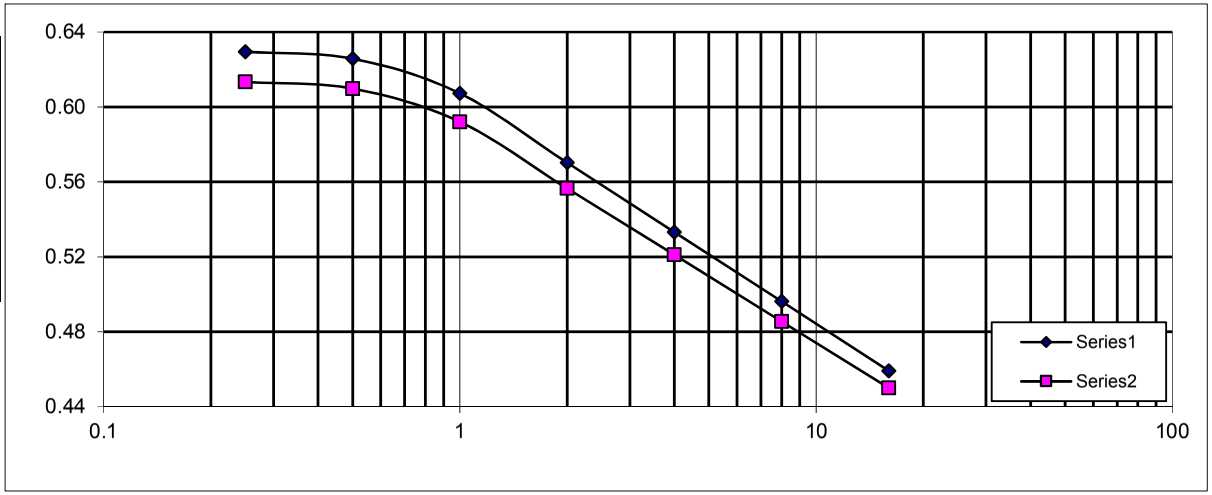
Fig. e - log p Plots from Consolidation Tests

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	0.117	0.6156	Series1
2/3.0	0.131	0.6617	Series2



BH No./		Initial V.R.	
Depth (m)	**C_c**	e_0	CURVE
2/4.5	0.123	0.6318	Series1
3/4.5	0.118	0.6156	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 =	$1+0.2\,(N_\varphi)^{0.5}\,D/B$		D_w at	G.L.	Fou'dn.Level
s_q =	1.2	1+0.2B/L	1	$d_q = d_\gamma$ =	1	for $\varphi < 10^o$	w =	0.5	1
s_γ =	0.8//0.6	1-0.4B/L	1	$d_q = d_\gamma$ =	$1+0.1\,(N_\varphi)^{0.5}\,D/B$	$\varphi > 10^o$		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 :

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

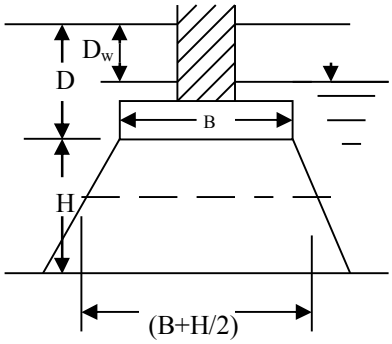
where H = thickness (in m) of the compressible layer
C_c = compression index of the soil
e_o = initial void ratio at mid-height of compressible soil layer = its m/c (m) x sp. Gravity
p_o = initial effective pressure at mid-height of the layer (t/m^2)
Δp = pressure increment at the mid-height of the layer 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= 1.99		c = 4.4	ϕ = 5.0	Nc = 6.49	Nq = 1.57	Nγ = 0.45
D [m]	B [m]	dc	dq = dg	c	q	I Term	II Term	III Term	qnf	qnf /F
1.5	2	1.16	1	4.4	1.493	33.23	0.85	0.45	34.53	11.51

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 = 0.266		Gs = 2.7		eo = 0.7182		Cc = 0.131		Dw = 0	
Depth D [m]	Width B [m]	qnf /F t/m^2	po t/m^2	H m	Δp t/m^2	log (1+ Δp/po)	s [mm] mm	λs mm mm	Remarks
1.5	2.0	11.5	3.0	3.0	6.6	0.5	116.0	92.7	Not OK
1.5	2.0	8.1	3.0	3.0	4.6	0.4	93.3	74.7	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 8.1 t/m^2.

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

N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

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
Tel. No. : 0612 - 2660850 • Fax No. : 0612 - 2660256
E-mail : bseidc@gmail.com • Website : http://www.bseidc.in • CIN : U80301BR2010SGC015859

पत्रांकः— BSEIDC/TECH/1960(9)/2018 - 7919 दिनांक 22/11/2021

प्रेषक,

मुख्य अभियंता
BSEIDC Ltd, Patna

सेवा में,

बिहार फाउंडेशन कंसल्टेन्ट
गंगा दर्शन अपार्टमेंट, फ्लैट न०—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 " **औरंगाबाद, मुजफ्फरपुर, बांका, गया एवं नवादा** " में आवासीय छात्रावास का निर्माण कार्य प्रस्तावित है। इस भवन के निर्माण स्थल पर मिट्टी की जाँच कराना है।

अतः अनुरोध है कि उपरोक्त स्थल का 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 स्थल पर सम्पर्क व्यक्ति, कार्य से संबंधित प्राचार्य / संबंधित कार्यपालक अभियंता रहेंगे।

विश्वासभाजन

22.11.21

मुख्य अभियंता

N. S. Bose Residential Hostel for Secondary School, Chakkadih, Block & Dist. Banka

(32)

नेताजी सुभाष चन्द्र बोस आवासीय छात्रावास निर्माण हेतु प्रस्तावित विद्यालयों के नाम एवं भूमि की विवरणी:

क्रमांक	जिला का नाम	प्रखंड का नाम	आवासीय छात्रावास से संबंधित विद्यालय का नाम	उपलब्ध भूमि की विवरणी (खाता सं0, खेसरा एवं रकबा सहित)
1	औरंगाबाद	नवीनगर	उच्च माध्यमिक विद्यालय, बेला	खाता सं0– 71, 132 प्लॉट न0 370, 369, 366, 1028 एराजी – 01 एकड़ 80 डिसमिल थाना सं0– 192, तौजी– 2802
2	मुजफ्फरपुर	साहेबगंज	राजकीयकृत उच्चतर म0 वि0 साहेबगंज	खाता सं0– पुराना– 56 खेसरा – पुराना– 1333, 1334 खाता सं0– नया– 494 खेसरा सं0– नया – 1520, 1521 रकबा – 06 एकड़ 50 डिसमिल लगभग।
3	बांका	बांका	प्रो0 म0 वि0 चक्काडीह	खाता– 153, 449 खेसरा – 508, 614 रकबा – 01 एकड़ 11 डिसमिल
4	गया	मोहनपुर	म0 वि0 जेठुआ डाहा	रकबा – 3 एकड़ 64 डिसमिल
5	नवादा	रजौली	म0 वि0 चिरैला	खाता (नया) – 58 प्लॉट– 651, 652 पुराना– 98, प्लॉट– 725, 726, 732, 733 एवं 734 रकबा– 3 एकड़ 36 डिसमिल

Accepted 21/09/2021 EE, SLO