REPORT ON
SOIL INVESTIGATION WORK FOR THE PROPOSED (G+4)STORIED RESIDENTIAL APARTMENT OF 1) SRI SHYAM SUNDAR KAYAL S/O LATE CHANDAN MAL KAYAL & 2) MRS. ANU KAYAL W/O SRI SHYAM SUNDAR KAYAL AT KATWA GHOSHHAT MADHAITALA IN PLOT NO. 657,658,659 & 660,KHATIAN NO.4343 & 4344 ,MOUZA-GHOSHHAT , J.L.NO.022,WARD NO.10,HOLDING NO.178,UNDER KATWA MUNICIPALITY ,P.S.&P.O.KATWA, DIST.PURBA BURDWAN, WEST BENGAL.

SOIL INVESTIGATION DONE BY:-

ASSOCIATED FOUNDATION ENGINEERS
20, K. N. SEN ROAD,
KOLKATA-700 042
DIAL:- 2442-5085 (O)
2418-4018 (R)

98310-69856 (M)
94331-37299 (M)

AUGUST – 2019

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A. GENERAL

It has been proposed to construct a multi storied building at the above location.

For ascertaining the safe bearing capacity of soil, it was decided to carry out a detailed sub-soil investigation and M/s. Associated Foundation Engineers was awarded this work for suggesting the most suitable type of foundation for the above project.

The scope of the work comprised of sinking 2 nos. of bore holes (1 x 15 m, 1 x 25 m.)

The bore holes were of 150mm. in diameter. Standard penetrometer tests were conducted at close intervals of depth. Undisturbed soil samples were recovered at suitable intervals and tested in the laboratory. Disturbed soil samples were also recovered at close intervals of depth for logging & identification purposes.

Depending on the above, this report presents bore logs, soil profiles & laboratory tests results. It is seen that the sub-soils are of medium quality.

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PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

SHEET NO-03

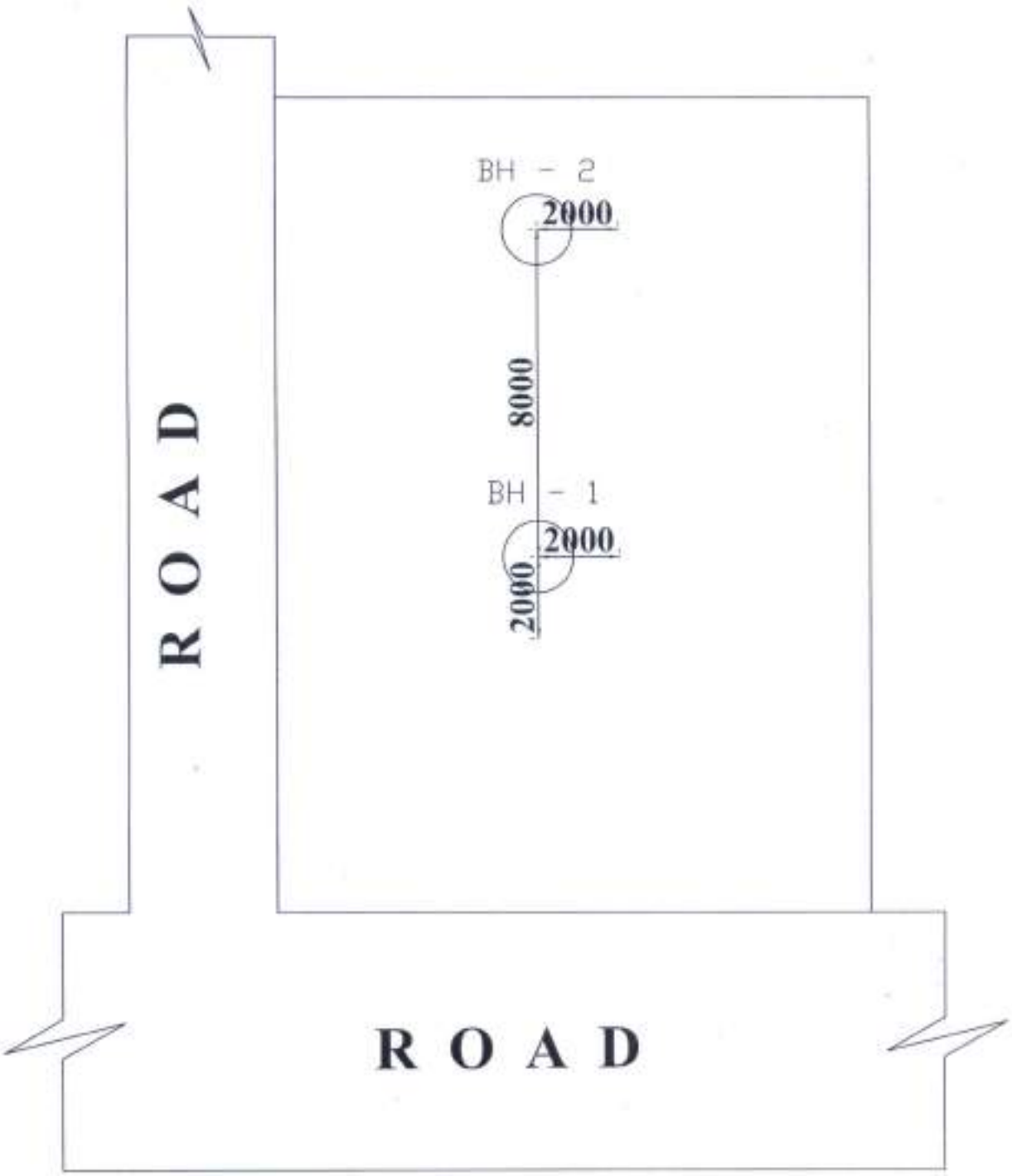

FIG. - 1. SCHEMATIC PLAN OF BORE HOLES.

B. FIELD INVESTIGATION

The various operations adopted during the coarse of this investigation are discussed in brief below.

BORING

For sinking the bore holes, the shell and auger method of boring was adopted. The holes were of 150mm. in diameter. These were advanced up to the required depth. Casing pipes of 150mm. diameter were used initially and bentonite slurry later on for side stabilisation of bore holes.

SAMPLING

During the course of boring, undisturbed and disturbed samples were collected at fairly regular intervals. Undisturbed samples of 10cm. diameter were recovered (whenever feasible) by means of open drive sampling using samplers of standard length 45cm. A two tier assembly was used with a cutting shoe attached to the lower end of thetube. This was driven by a jarring link as far as practicable. After withdrawal, both ends of the tubes were sealed with paraffin wax capped, labeled and transported to the laboratory. A number of disturbed samples were also collected at suitable intervals for identification and logging purposes.

STANDARD PENETRATION TESTS

A number of standard penetration tests were conducted at regular intervals in thebore holes. The tests were conducted by driving a standard split spoon sampler by means of a monkey of 65kg. weight falling freely from a height of 75cm. The number of blows required for every 7.5cm. Penetration was recorded up to a total penetration of 60cm. The S.P.T. or 'N' value was estimated as the number of blows required for the middle 30cm. penetration.

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The split spoon sampler conformed to I.S. specification with an outer diameter of 50.8mm. and an inner diameter of 35mm. After completion of the test the samplerwas withdrawn, It was opened and the soil specimen was preserved for logging and identification purposes.

C. LABORATORY TESTING

The following laboratory tests were performed on undisturbed and disturbed samples to determine the engineering properties of the sub-soil at different depths. All the tests were carried out according to Indian standard specifications.

1. Natural Moisture Content.
2. Atterberg Limits (LL. & PL.)
3. Hydrometer and Sieve Analysis.
4. Bulk Density (wet & dry)
5. Specific Gravity.
6. Strength Tests.
7. Consolidation.

The results of these tests have been presented systematically in result sheets later on.

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D. SUB-SOIL STRATIFICATION AND PROPERTIES

I. SUB-SOIL STRATIFICATION

The exploratory borings at the site revealed a medium quality of sub-soil. The generalised soil profile encountered at the site is shown in fig.2 and in the enclosed bore hole log data sheets in the appendix. The variation of 'N' values with depth is shown in figure 3 & in the bore hole log data sheets. The average sub-soil profile with properties are shown in fig. 4. The results of the laboratory tests conducted to determine the engineering properties of the sub-soil are presented in the appendix. The other back-up sheets are also presented therein. Based on visual classification and results of field & laboratory tests four major strata are identified.

Brief descriptions of the various soil strata are given below: -

TOP SOIL – FILLED UP MATERIALS

Very loose filling of clayey silt extends down to a depth of 1.00 m. below E.G.L.

1. STRATUM - I

Medium stiff light grey to brownish grey clayey silt extends from 1.00 m. down to the depth of 6.00 m. below E.G.L.

The maximum & minimum values of 'N' observed in this layer are 8 & 6 respectively.

The average engineering properties are as follows:-

Bulk density	1.87	gm /c.c.
Dry density	1.57	gm /c.c
Water content	19	%
Specific gravity	2.70	
Void ratio	0.83	
Cohesion	0.37	kg /sq.cm
Friction angle	0°	degree
Liquid limit	43	%
Plastic limit	23	%
Sand size particle	6	%
Silt size particle	62	%
Clay size particle	32	%

According to IS classification system, it may be symbolised as CI combination.

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PROJECT: PROPOSED (G+4) STORIED BUILDING AT SHEET NO-07

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

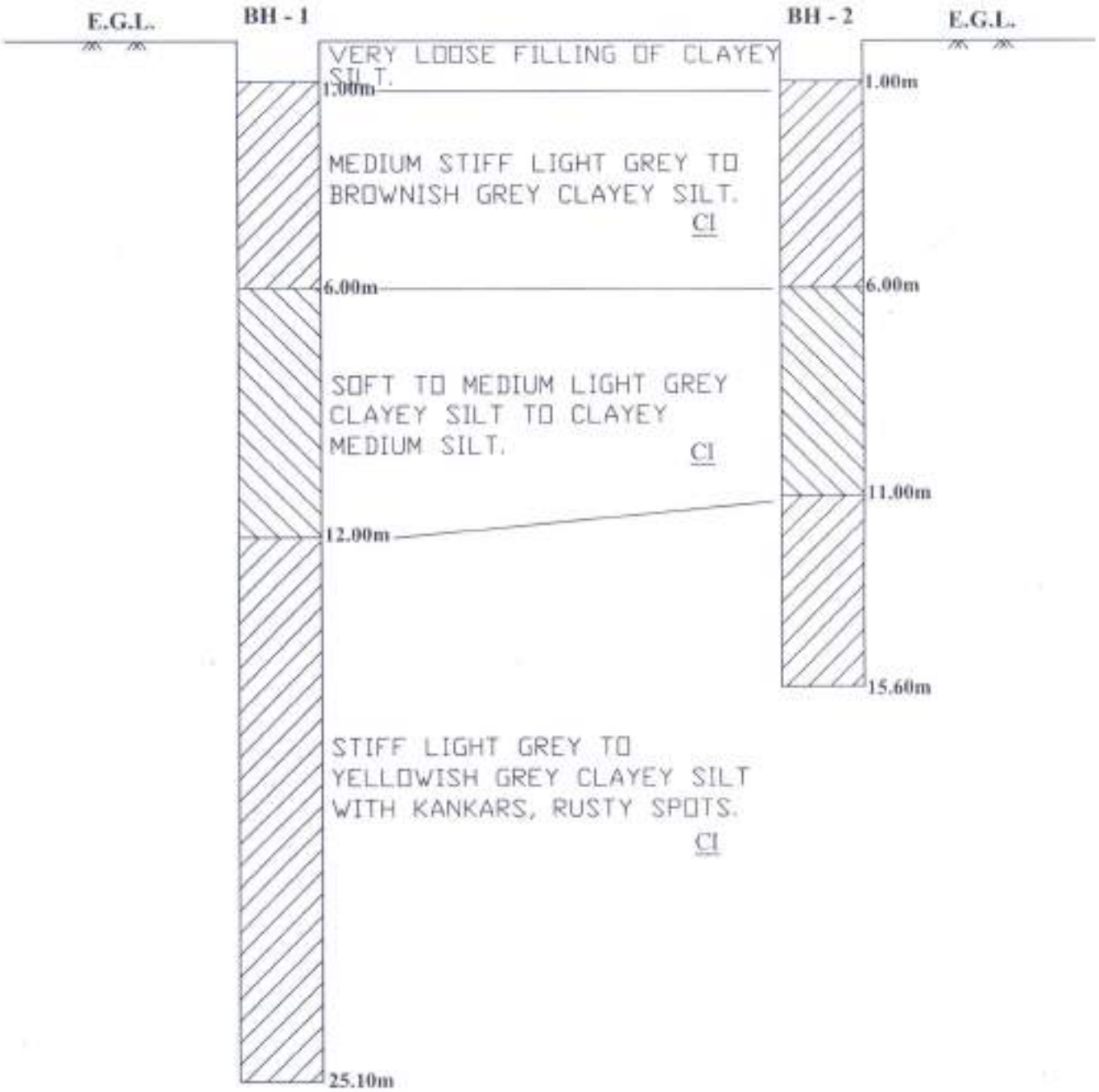

FIG. - 2. GENERALISED SUB-SOIL PROFILE.

PROJECT: Proposed (G+4) Storied Building at
KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

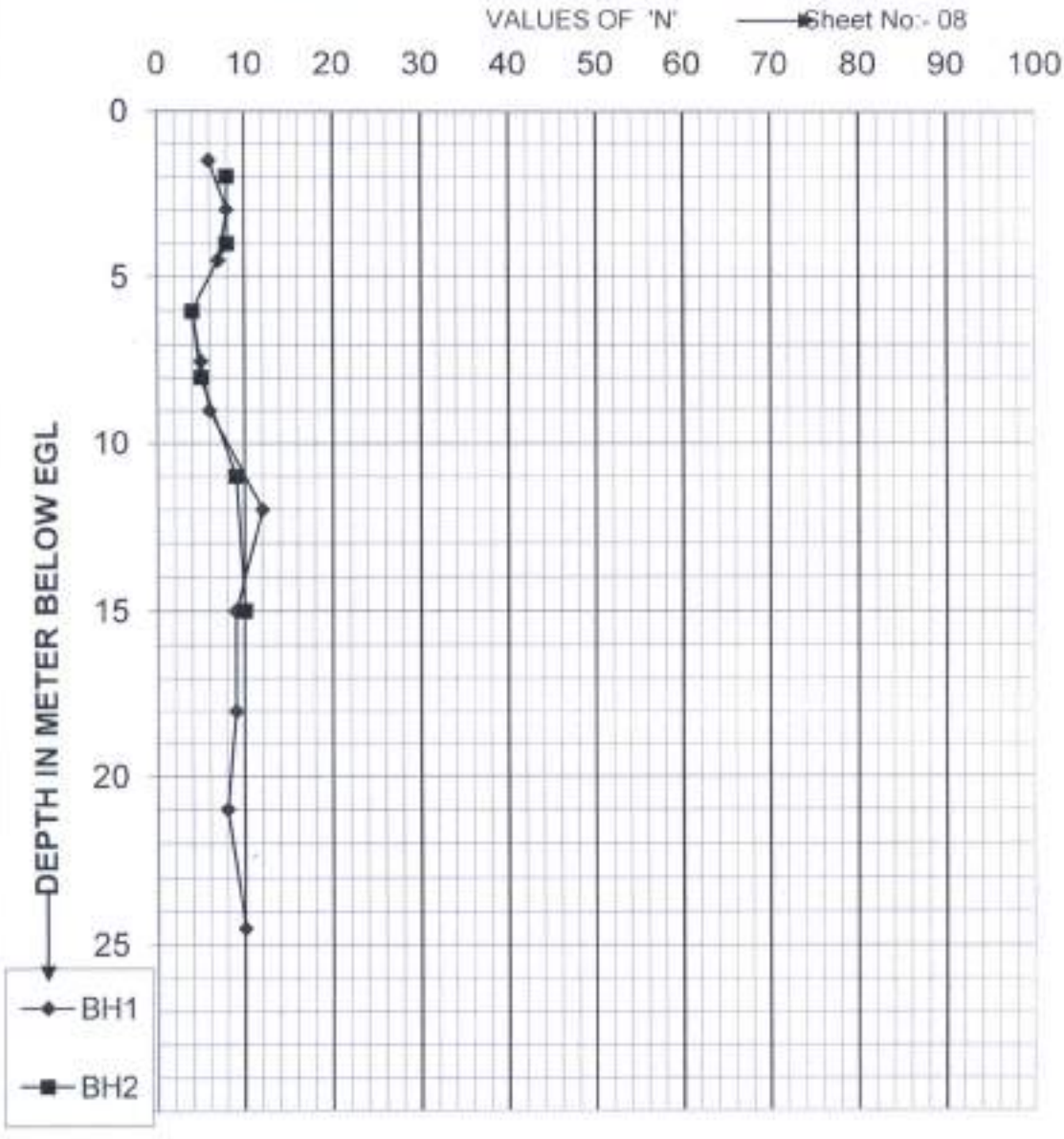

FIG. 3. 'N' VS. DEPTH PLOT.

2. STRATUM - II

Soft to medium light grey clayey silt to clayey medium silt extends from 6.00 m. down to the depth of 11.50 m. below E.G.L.

The maximum & minimum values of 'N' observed in this layer are 6 & 4 respectively.

The average engineering properties are as follows:-

Bulk density	1.85	gm /c.c.
Dry density	1.51	gm /c.c
Water content	23	%
Specific gravity	2.68	
Void ratio	0.89	
Cohesion	0.35	kg /sq.cm
Friction angle	0°	degree
Liquid limit	45	%
Plastic limit	24	%
Sand size particle	9	%
Silt size particle	61	%
Clay size particle	30	%

According to IS classification system, it may be symbolised as CI combination.

3. STRATUM - III

Stiff light grey to yellowish grey clayey silt with kankars, rusty spots extends from 11.50 m. down to the termination depth of 25.10 m. below E.G.L.

The maximum & minimum values of 'N' observed in this layer are 12 & 8 respectively.

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The average engineering properties are as follows:-

Bulk density	1.90	gm /c.c.
Dry density	1.57	gm /c.c
Water content	22	%
Specific gravity	2.70	
Void ratio	0.79	
Cohesion	0.49	kg /sq.cm
Friction angle	0°	degree
Liquid limit	48	%
Plastic limit	27	%
Sand size particle	7	%
Silt size particle	54	%
Clay size particle	39	%

According to IS classification system, it may be symbolised as CI combination.

From the above, it can be said that the sub-soils are of medium quality.

II. SUB - SOIL PROPERTIES

The details of laboratory tests results have been presented sequentially in the appendix. The other back-up sheets are given therein as below:-

1. Laboratory tests results tables.
2. Bore Hole log data sheets/ field records.
3. Consolidation characteristics.
4. Grain size distribution curves from sieve & hydrometer analysis.

Based on the bore logs and the laboratory tests results, the average sub-soil profile with the average properties are presented in fig. 4.

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PROJECT: PROPOSED (G+4) STORIED BUILDING AT KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

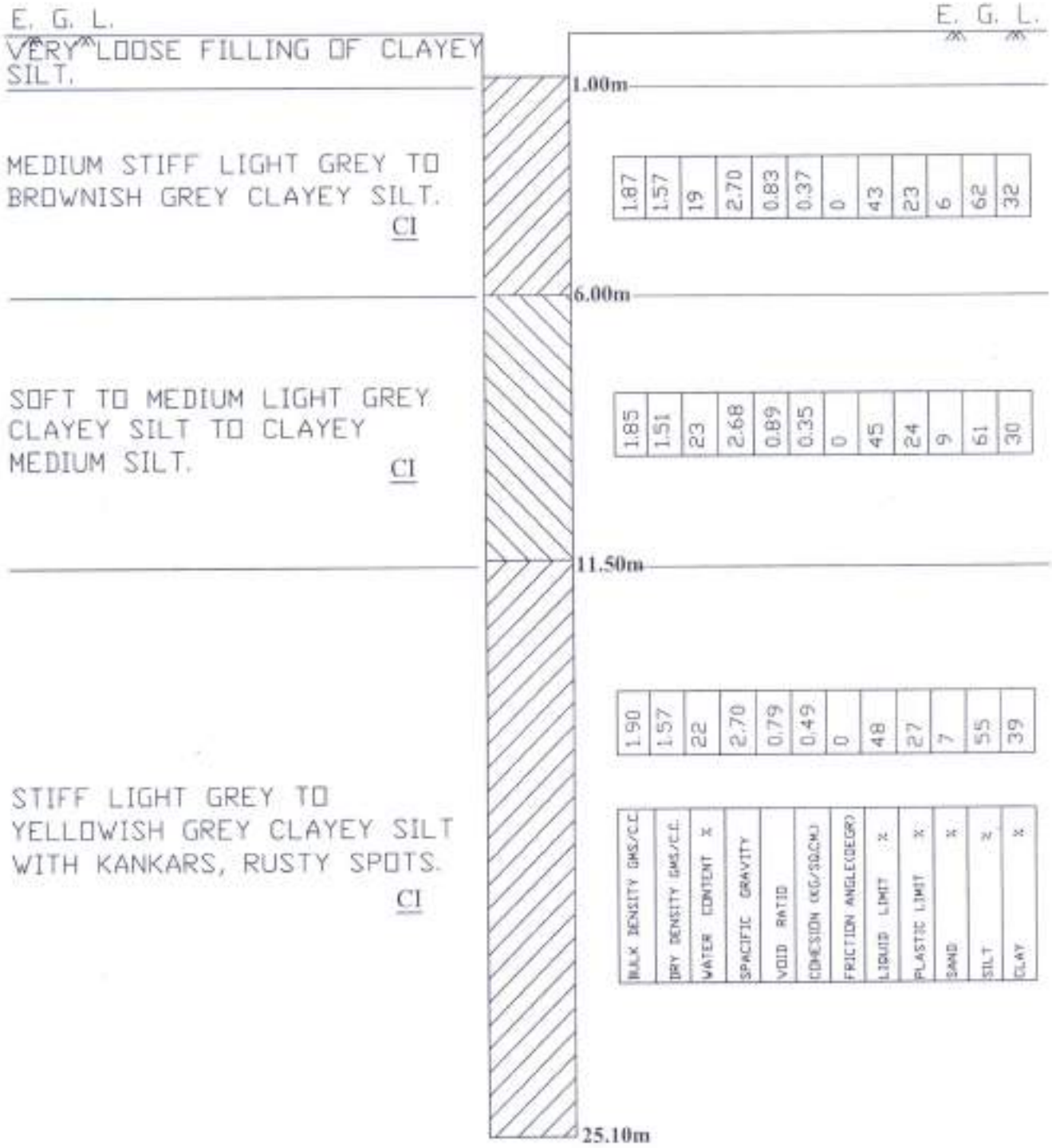

FIG. - 4. AVERAGE SUB-SOIL PROFILE WITH PROPERTIES.

E. FOUNDATION CONSIDERATIONS AND BEARING CAPACITY

The proposed construction would be a multi storied building. Accordingly the loading would be moderate which would depend also on column spacing for the proposed RCC framed structure. However, the foundation design would not only depend on the height and loading but also on the sub-soil condition. For the sub-soil condition the two necessary conditions are to be satisfied i.e. the soil would not fail in shear and the settlement should be within permissible limit.

Shallow foundations in the form of individual footings may be investigated at first in this case for supporting lightly to moderately loaded structures. Individual footings of size 2.0m to 3.0m. founded at a depth of **1.2 m.** below G. L. may be used according to the column spacing and planning of the building. Net allowable bearing capacities for such footings have been calculated keeping the settlement within permissible limit of 7.5 cm. and these have been shown below :-

Footing Size	Net Allowable Bearing Capacity, (t / sq.m.)	Settlement(mm.)	Recommended Capacity, (t/ sq.m.)
2.0m x 2.0m	9.9	27.3	9.9
2.5m x 2.5m	9.7	34.7	9.7
3.0m x 3.0m	9.5	41.0	9.5

Shallow foundations in the form of 1.5m., 2.0m. & 2.5m. wide strip footings have also been investigated. Net allowable bearing capacities with permissible settlements of 7.5 cm. for such footings have been worked out and shown below :-

Footing Size	Net Allowable Bearing Capacity, (t / sq.m.)	Settlement(mm.)	Recommended Capacity, (t/ sq.m.)
1.5m wide	8.6	54.9	8.6
2.0m wide	8.4	65.1	8.4
2.5m wide	8.2	75.0	8.0

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PROJECT: PROPOSED (G+4) STORIED BUILDING AT

SHEET NO-13

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

FIG. -5. FOUNDATION DESIGN MODEL FOR SHALLOW FOOTINGS.

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SAMPLE CALCULATION FOR BEARING CAPACITY, SIZE 2m.x 2m.

Net Allowable Bearing Capacity , qna = C Nc \ F.O.S.

C= 3.70 t/ sq.m , F.O.S.= 2.5

Therefore , qna = 1.48 Nc

Now, Nc = 6 x (1 + 0.2 x Df / B)

For Df = 1.2 m & B= 2 m

Nc = 6.72

Therefore , qna = 6.72 x 3.7 / 2.5 = 9.9 t/ sq.m

SAMPLE CALCULATION FOR BEARING CAPACITY, 2m. WIDE STRIP

Nc = 5 x (1 + 0.2 x Df / B)

For Df = 1.2 m & B= 2 m

Nc = 5.6

Therefore , qna = 5.6 x 3.7 / 2.5 = 8.288 t/ sq.m

PROJECT: Proposed (G+4)storied Building at KATWA GHOSHHAT MADHAITALA, P.S.&P.O.KATWA	ASSOCIATED FOUNDATION ENGINEERS	SHEET NO 15

SAMPLE CALCULATION FOR SETTLEMENT, SIZE 2m. x 2m.

STRATUM - I

$$\Delta p = \frac{2.0 \times 2.0 \times 10}{(\ 2\ +\ 2.40\ )^2} = 2.066 \text{ t/sq.m.}$$

H = 4.80 m.

α = 0.85

Mv = 0.0025 sq.m/t

Therefore ,

St_1 = 0.0025 x 4.8 x 0.85 x 2.066 x 1000 = 21.1 mm

STRATUM - II

$$\Delta p = \frac{2.0 \times 2.0 \times 10}{(\ 2\ +\ 7.55\ )^2} = 0.439 \text{ t/sq.m.}$$

H = 5.5 m.

α = 0.90

Mv = 0.003 sq.m/t

Therefore ,

St_2 = 0.003 x 5.5 x 0.9 x 0.439 x 1000 = 6.51 mm

Therefore, $St = St_1 + St_2$ = 21.07 + 6.513 = 27.6 mm

Settlement for 9.9 t / sq.m. loading = 0.99 x 27.59 = 27.3 mm

In view of the existing soft soil deposit at the top, deep foundations in the form of bored cast-in-situ R.C.C. piles have also been investigated for the proposed construction. These should rest at (-) 15.0 m. having cut-off at (-) 1.2 m. below the E.G.L. depending on functional requirement.

PILE CAPACITY DETERMINATION

Ultimate Load Capacity, $Pu = Pf + Pt$

$Pf = \pi D \times [\, 4.8 \times 3.7 \times 1.0 + 5.50 \times 3.5 \times 1.0 + 3.5 \times 4.9 \times 0.85 \,]$

$= 162\, D$

$Pt = \pi D^2/4 \times 9 \times 4.9 = 35\, D^2$

$\therefore Pu = Pf + Pt = 162\, D + 35\, D^2$

$\therefore Pall = 64.8\, D + 14\, D^2$

The following safe load carrying capacity values may be used depending on requirement:-

PILE DIA, mm.	PILE TIP , m.	CUT-OFF, m.	SAFE CAPACITY, t
400	(-) 15.0	(-)1.2	28
450	(-) 15.0	(-)1.2	32
500	(-) 15.0	(-)1.2	36

However, the actual load carrying capacity should be determined by carrying out load tests at site as per IS code of practice. A minimum distance of 2.5D – 3D should be maintained between the center to center of piles , where D is the pile diameter.

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PROJECT: PROPOSED (G+4) STORIED BUILDING AT SHEET NO-15B

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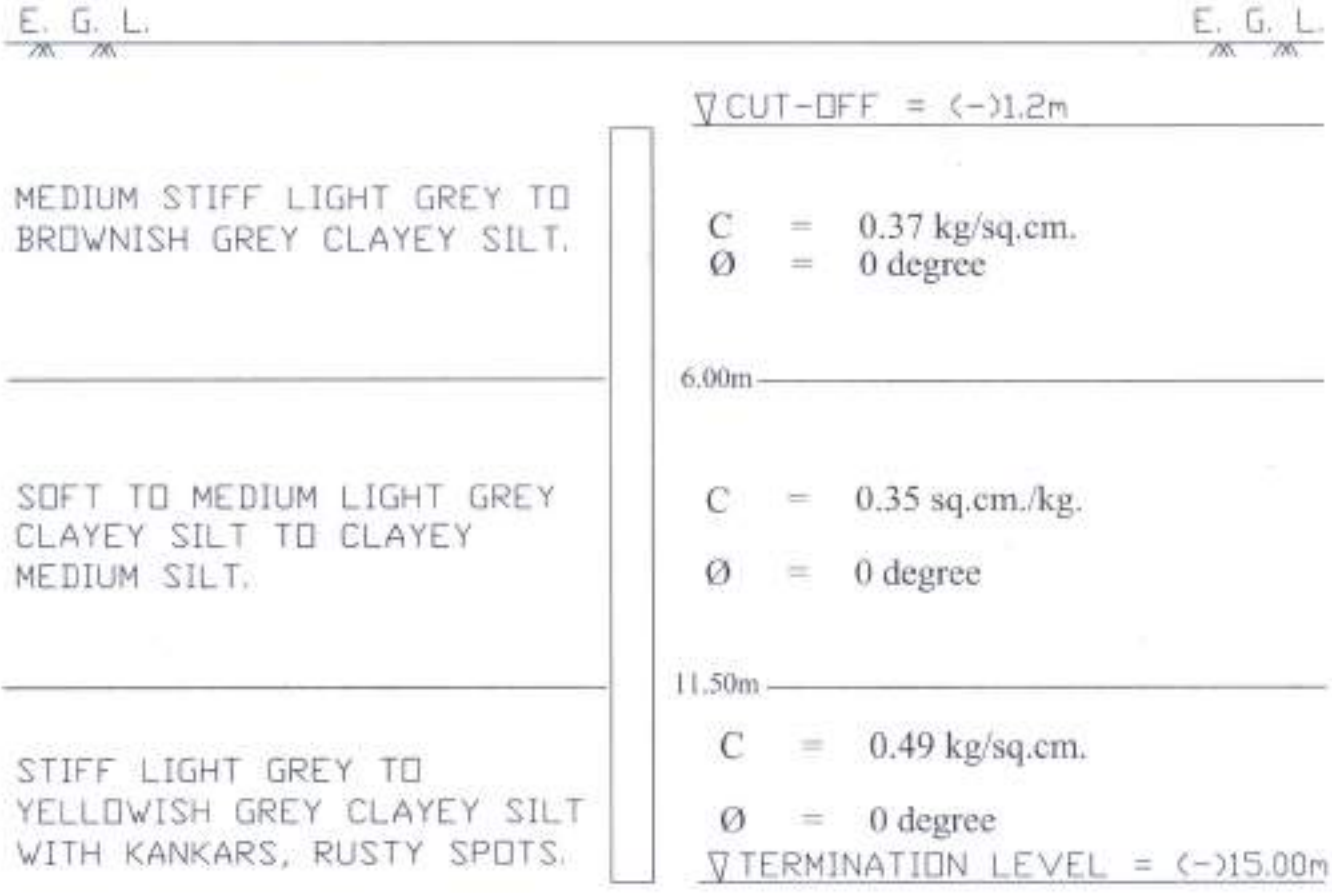

FIG. - 5A. FOUNDATION DESIGN MODEL FOR DEEP FOUNDATIONS.

F. RECOMMENDATIONS

Based on the field and the laboratory tests results and the above discussions, the followings are summarized :-

1. The sub-soils are of medium quality.

2. Very loose filling of clayey silt extends down to a depth of 1.00 m. below E.G.L.

3. Medium stiff light grey to brownish grey clayey silt extends from 1.00 m. down to the depth of 6.00 m. below E.G.L. The strength of this layer is medium (C = 0.37 kg/sq.cm.) and compressibility is medium (Mv = 0.025 sq.cm./ kg for 0.50 to 1.0 kg/sq.cm. pressure range).

4. Soft to medium light grey clayey silt to clayey medium silt extends from 6.00 m. down to the depth of 11.50 m. below E.G.L. The strength of this layer is medium (C = 0.35 kg/sq.cm.) and compressibility is medium (Mv = 0.030 sq.cm./ kg for 0.50 to 1.0 kg/sq.cm. pressure range).

5. Stiff light grey to yellowish grey clayey silt with kankars, rusty spots extends from 11.50 m. down to the termination depth of 25.10 m. below E.G.L.

6. Depth of foundation for the proposed construction is estimated at **(-) 1.2m**. below the E.G.L. However, the foundations should go at least 200 to 300mm. in side the parent soil depending on the location.

7. The standing water level was observed at (-) 3.20 m. below the E.G.L. during boring.

8. Isolated footings, if used, are suggested to be tied at the foundation level to reduce the differential settlement. Construction in stages is recommended.

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9. The following net safe bearing capacity values may be taken for routine design:-

Type of Footing	Size	Net safe bearing capacity, t/sq.m.
Individual	2m x 2m	9.9
	2.5m x 2.5m	9.7
	3.0m x 3.0m	9.5
Strip	1.5m Wide	8.6
	2.0m Wide	8.4
	2.5m Wide	8.0

The values for the intermediate sizes of footings should be obtained by interpolation.

10. In view of the existing soft soil deposit at the top, deep foundations in the form of bored cast-in-situ R.C.C. piles have also been investigated for the proposed construction These should rest at (-) 15.0 m. having cut-off at (-) 1.2 m. below the E.G.L. depending on functional requirement.

11. The following safe load carrying capacity values may be used depending on requirement :-

PILE DIA, mm.	PILE TIP , m.	CUT-OFF, m.	SAFE CAPACITY, t
400	(-) 15.0	(-)1.2	28
450	(-) 15.0	(-)1.2	32
500	(-) 15.0	(-)1.2	36

However, the actual load carrying capacity should be determined by carrying out load tests at site as per IS code of practice. A minimum distance of 2.5D – 3D should be maintained between the center to center of piles, where D is the pile diameter.

12. Pile caps or Isolated footings are suggested to be tied at the foundation level to reduce the differential settlement.

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PROJECT: Proposed (G+4) Storied Building at KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA	ASSOCIATED FOUNDATION ENGINEERS	SHEET NO. 19

TABLE : 1. LABORATORY TESTS RESULT

BORE HOLE	SAMPLE NO	DEPTH (M.)	BULK DENSITY (gms/c.c.)	DRY DENSITY (gms/cc)	W %	G	eo	C (kg/sqcm)	0° (Degree)	LL %	PL %	SAND %	SILT %	CLAY %
BH-1	UDS-1	1.00-1.45	1.86	1.62	15	2.70	0.843	0.36	0°	43	23	7	60	33
BH-1	UDS-2	4.00-4.45	1.87	1.56	20	2.71	0.828	0.37	0°	44	24	6	60	34
BH-1	UDS-3	7.00-7.45	1.85	1.48	25	2.68	0.894	0.34	0°	45	24	8	61	31
BH-1	UDS-4	14.00-14.45	1.90	1.57	21	2.67	0.793	0.48	0°	47	27	6	55	39
BH-2	UDS-1	1.50-1.95	1.87	1.56	20	2.70	0.828	0.37	0°	42	22	5	63	32
BH-2	UDS-2	3.00-3.45	1.88	1.54	22	2.69	0.817	0.38	0°	43	22	6	64	30
BH-2	UDS-3	9.00-9.45	1.84	1.53	20	2.68	0.887	0.35	0°	44	24	10	61	29
BH-2	UDS-4	12.00-12.45	1.90	1.56	22	2.72	0.787	0.49	0°	48	27	7	55	38
			1.87	1.57	19.25	2.70	0.83	0.37	#VALUE!	43.00	22.75	6.00	61.75	32.25
			1.85	1.51	22.50	2.68	0.89	0.35	#VALUE!	44.50	24.00	9.00	61.00	30.00
			1.90	1.57	21.50	2.70	0.79	0.49	#VALUE!	47.50	27.00	6.50	55.00	38.50

PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

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SHEET NO. 20

BORE LOG DATA SHEET

BORE HOLE NO : 1

PENETROMETER (SPT)	NOS.		NOS.
PENETROMETER (SPT)	11	UNDISTURBED (UDS)	4
CONE (PC)		PENETROMETER (SPT)	11
VANE (V)		DISTURBED (DS)	1

COMMENCED ON : 8-7-2019

COMPLETED ON : 9-7-2019

BORE HOLE DIA : 150mm.

R.L. OF GROUND :

WATER STRUCK AT : 3.20m

STANDING WATER LEVEL : 3.20m

DESCRIPTION	SYMBOL	N - VALUE (0 4 8 12 16)	SAMPLES REF NO.	SAMPLES DEPTH (M)
VERY LOOSE FILLING OF CLAYEY SILT.			DS - 1	1.00
1.00M			UDS - 1	1.00 - 1.45
MEDIUM STIFF LIGHT GREY TO BROWNISH GREY CLAYEY SILT.		N =6	SPT - 1	1.50 - 2.10
		N =8	SPT - 2	3.00 - 3.60
			UDS - 2	4.00 - 4.45
		N =7	SPT - 3	4.50 - 5.10
6.00M		N =4	SPT - 4	6.00 - 6.60
			UDS - 3	7.00 - 7.45
SOFT TO MEDIUM LIGHT GREY CLAYEY SILT TO CLAYEY MEDIUM SILT.		N =5	SPT - 5	7.50 - 8.10
		N =6	SPT - 6	9.00 - 9.60
12.00M		N =12	SPT - 7	12.00 - 12.60
			UDS - 4	14.00 - 14.45
		N =9	SPT - 8	15.00 - 15.60
STIFF LIGHT GREY TO YELLOWISH GREY CLAYEY SILT WITH KANKARS, RUSTY SPOTS.		N =9	SPT - 9	18.00 - 18.60
		N =8	SPT - 10	21.00 - 21.60
25.10M		N =10	SPT - 11	24.50 - 25.10

PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 21

BORE LOG DATA SHEET

BORE HOLE NO : 2

PENETROMETER (SPT)	NOS.		NOS.
PENETROMETER (SPT)	6	UNDISTURBED (UDS)	4
CONE (PC)		PENETROMETER (SPT)	6
VANE (V)		DISTURBED (DS)	1

COMMENCED ON : 9-7-2019

COMPLETED ON : 9-7-2019

BORE HOLE DIA : 150mm.

R.L. OF GROUND :

WATER STRUCK AT : 3.20m

STANDING WATER LEVEL : 3.20m

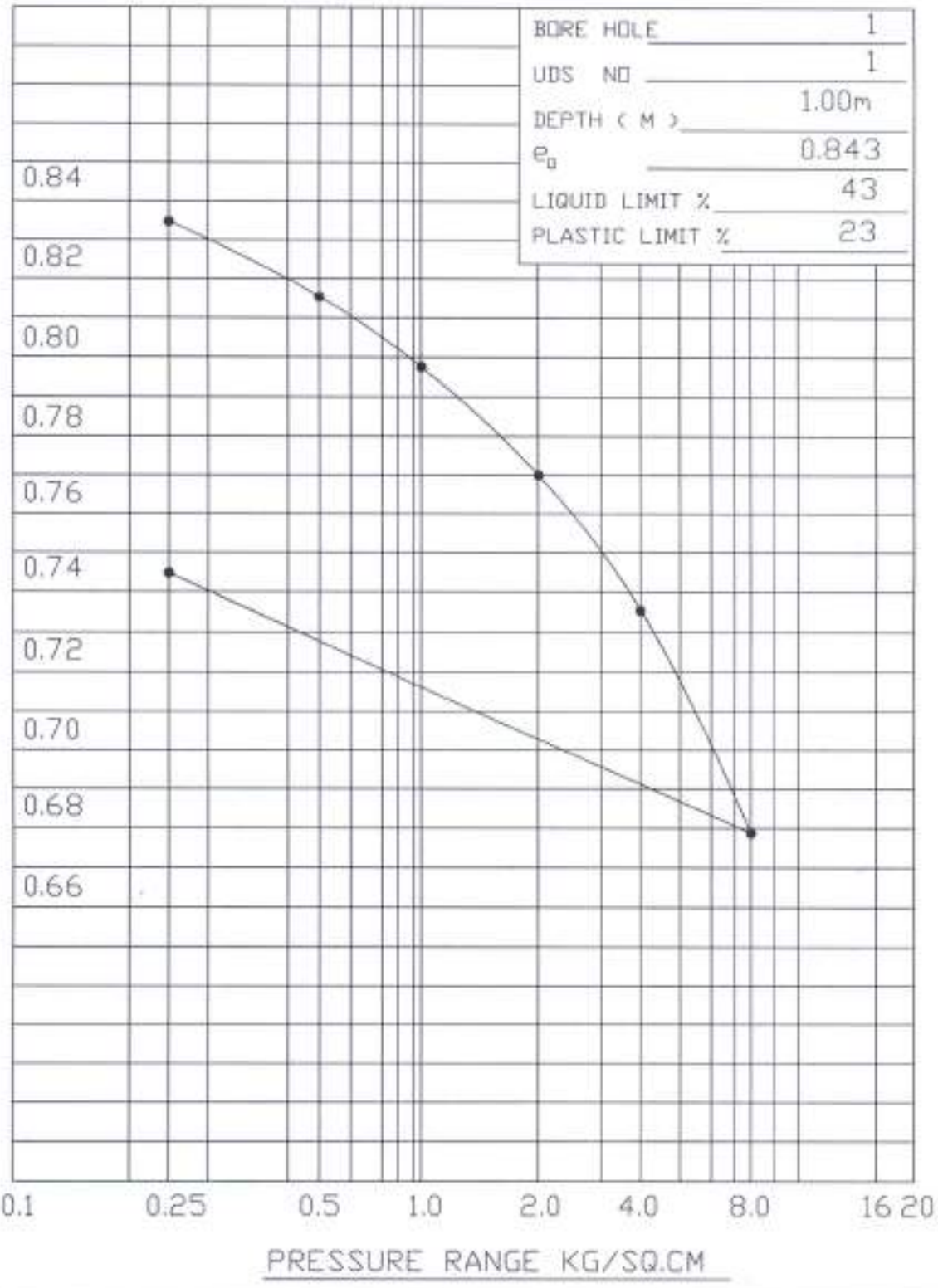
DESCRIPTION	SYMBOL	N - VALUE (0 4 8 12 16)	SAMPLES REF NO.	SAMPLES DEPTH (M)
VERY LOOSE FILLING OF CLAYEY SILT.			DS - 1	0.90
1.00M			UDS - 1	1.50 - 1.95
		N = 8	SPT - 1	2.00 - 2.60
MEDIUM STIFF LIGHT GREY TO BROWNISH GREY CLAYEY SILT.			UDS - 2	3.00 - 3.45
		N = 8	SPT - 2	4.00 - 4.60
6.00M		N = 4	SPT - 3	6.00 - 6.60
		N = 5	SPT - 4	8.00 - 8.60
SOFT TO MEDIUM LIGHT GREY CLAYEY SILT TO CLAYEY MEDIUM SILT.			UDS - 3	9.00 - 9.45
11.00M		N = 9	SPT - 5	11.00 - 11.60
STIFF LIGHT GREY TO YELLOWISH GREY CLAYEY SILT WITH KANKARS, RUSTY SPOTS.			UDS - 4	12.00 - 12.45
15.60M		N = 10	SPT - 6	15.00 - 15.60

PROJECT: PROPOSED (G+4) STORIED BUILDING AT KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 22

e VS LOG p CURVE



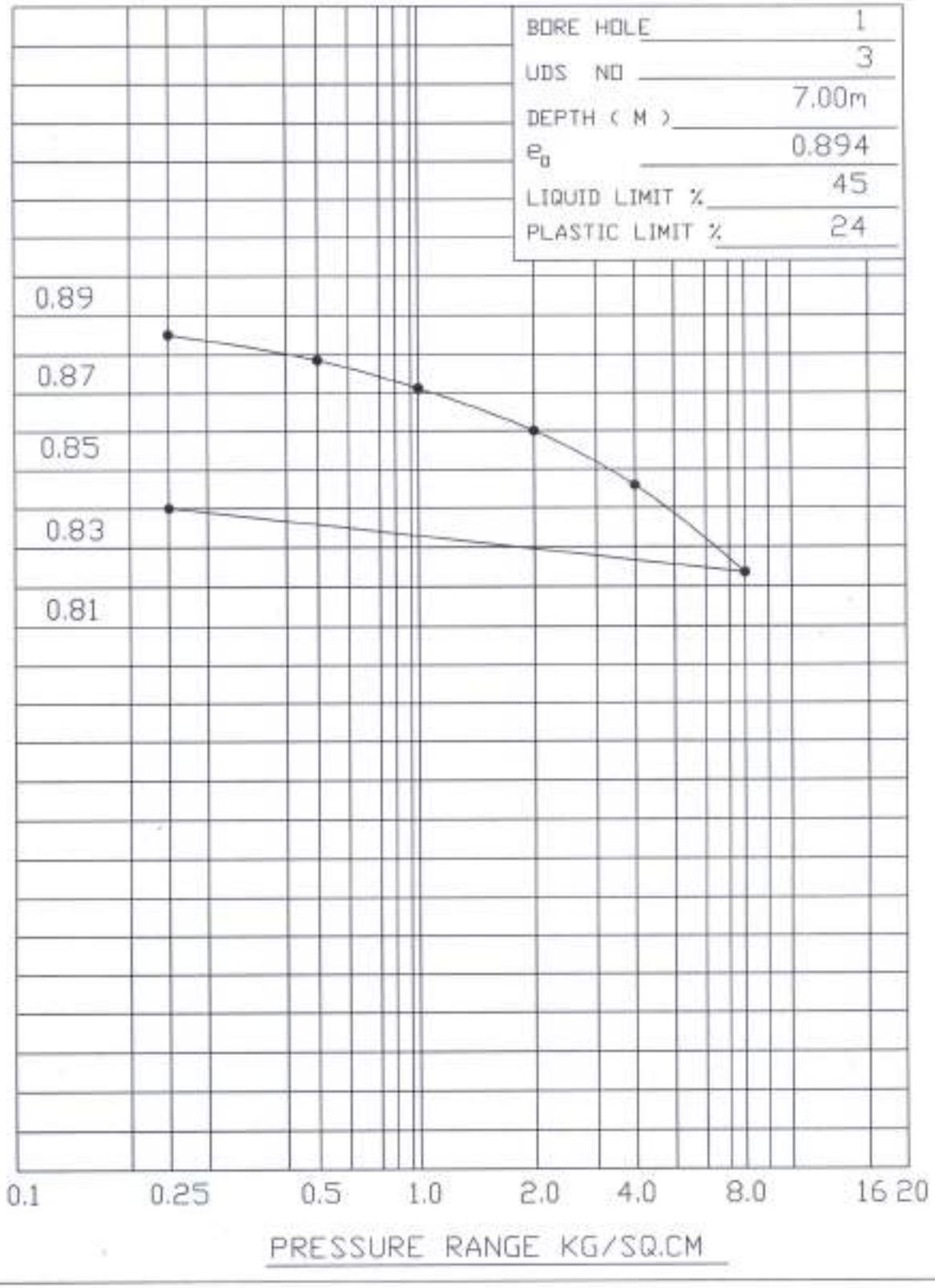
PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 23

e VS LOG p CURVE



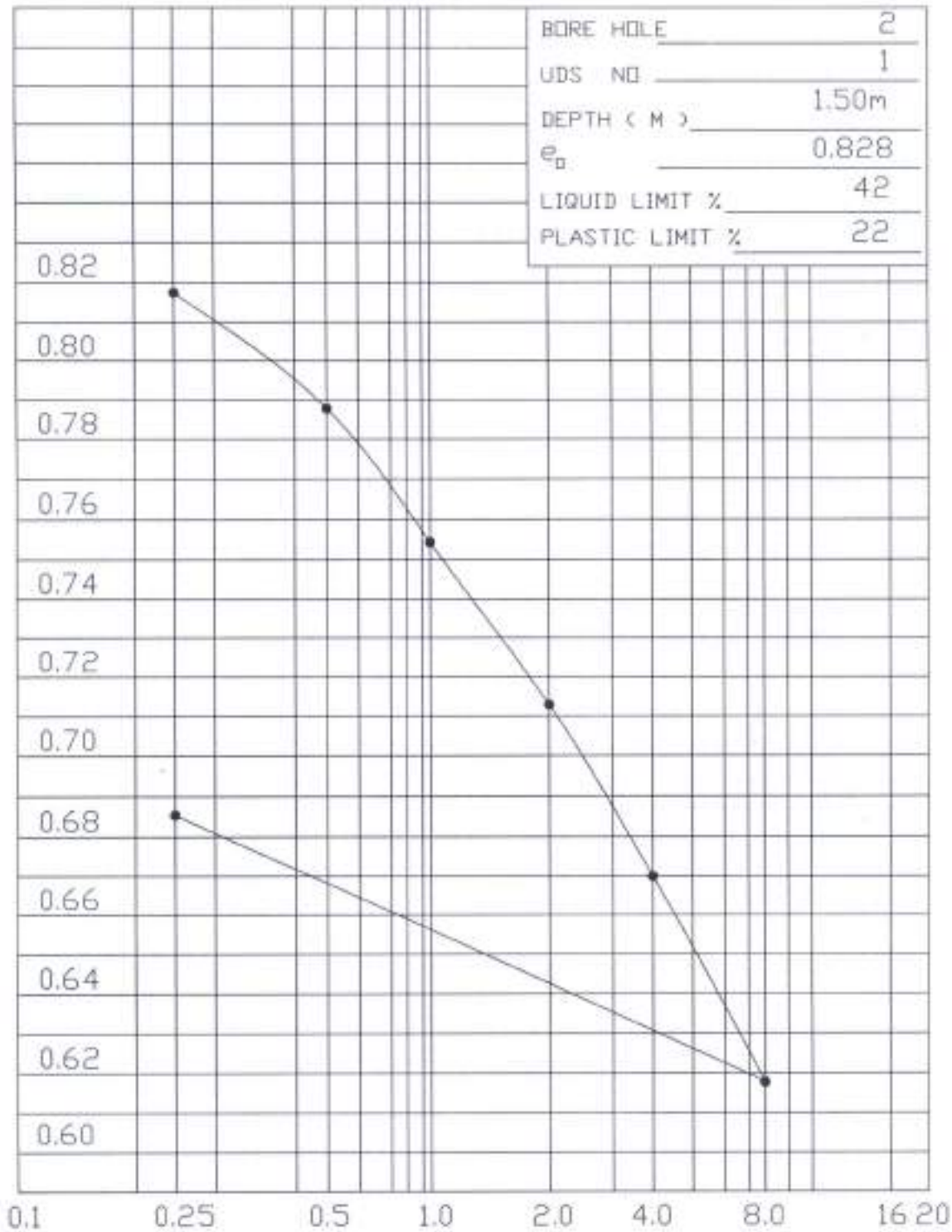
PROJECT: PROPOSED (G+4) STORIED BUILDING AT KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 24

e VS LOG p CURVE

BORE HOLE	2
UDS NO	1
DEPTH (M)	1.50m
e_o	0.828
LIQUID LIMIT %	42
PLASTIC LIMIT %	22



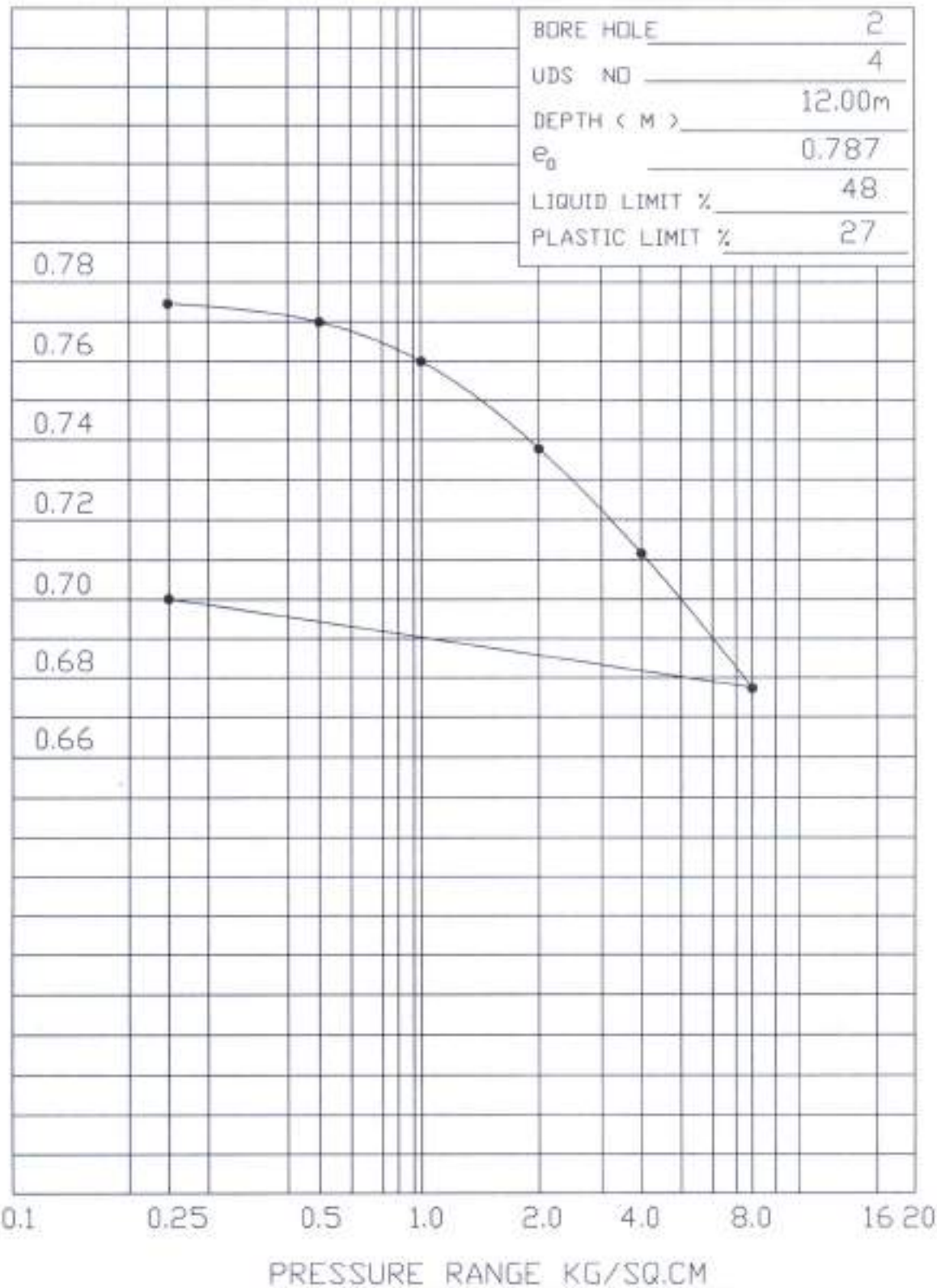
PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 25

e VS LOG p CURVE



PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 26

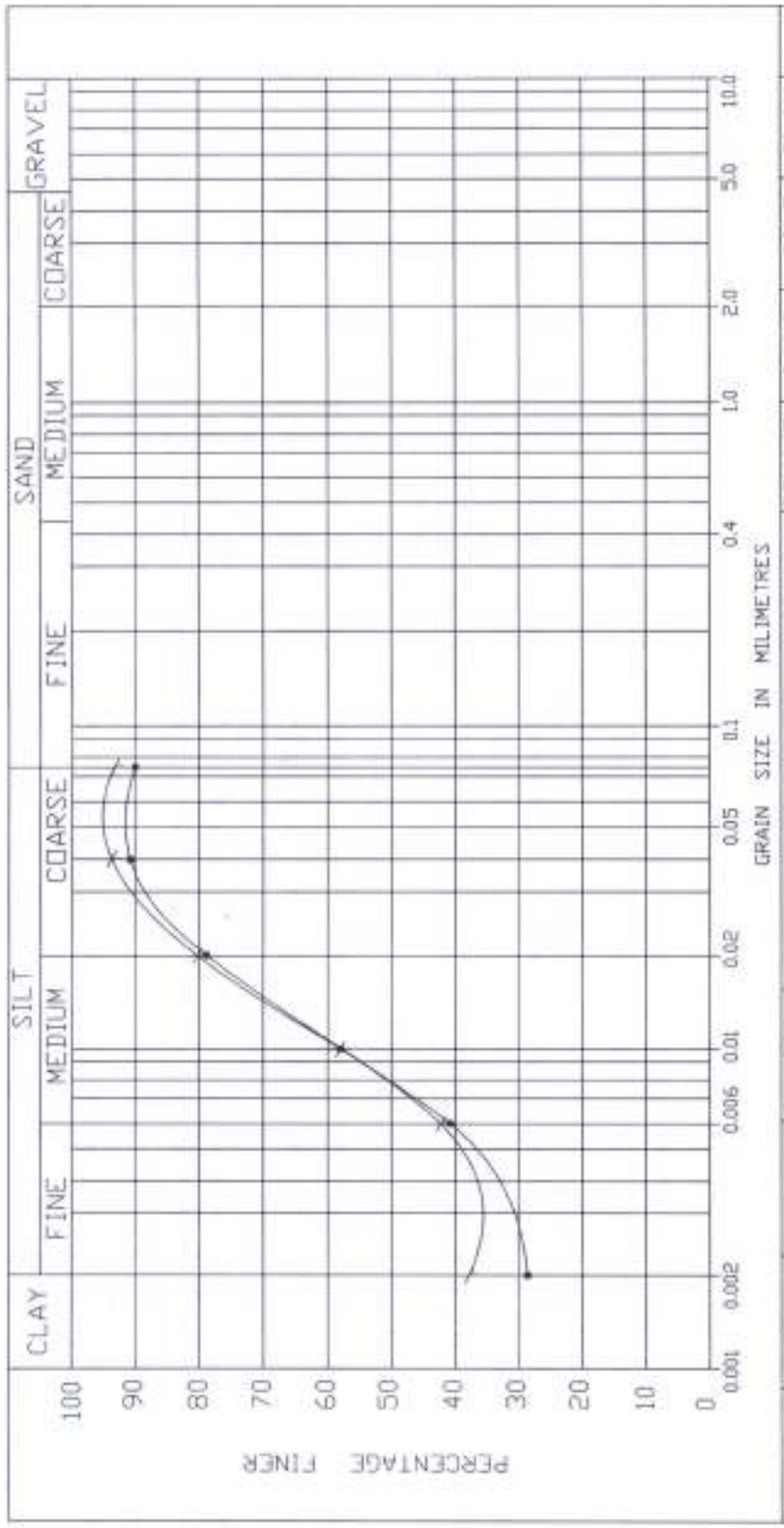
SAMPLE NUMB.	BORE HOLE	DEPTH	CLASSI-FICATION	DESCRIPTION	GRAVEL %	SAND %	SILT %	CLAY %	GRAIN SIZE DISTRIBUTION
UDS -1	1	1.00m	● - ●	SANDY CLAYEY SILT		7	60	33	
UDS -2	1	4.00m	X - X	SANDY CLAYEY SILT		6	60	34	

PROJECT: PROPOSED (G+4) STORIED BUILDING AT

KATWA GHOSHHAT MADHAITALA, P.S. & P.O.- KATWA.

ASSOCIATED FOUNDATION ENGINEERS

SHEET NO. 27



SAMPLE NUMB.	BORE HOLE	DEPTH	CLASSI-FICATION	DESCRIPTION	GRAIN SIZE DISTRIBUTION			
					GRAVEL %	SAND %	SILT %	CLAY %
UDS -3	2	9.00m	● - ●	SANDY CLAYEY SILT		10	61	29
UDS -4	2	12.00m	X - X	SANDY CLAYEY SILT		7	55	38