(423)

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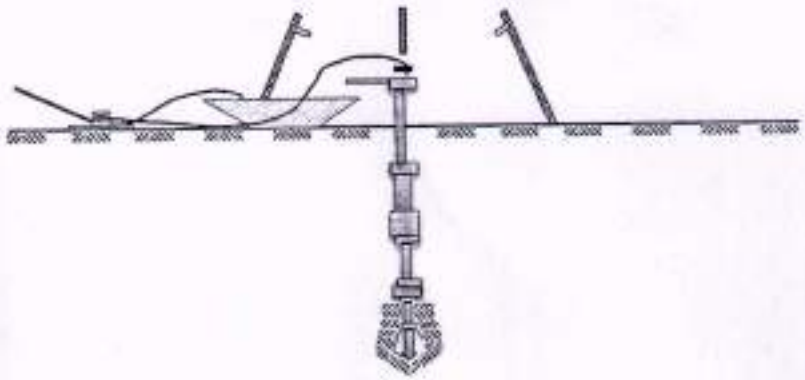
REPORT ON SOIL INVESTIGATION



-: NAME OF WORK :-

CONSTRUCTION OF PROPOSED ROW HOUSING AT NISCHINTAPUR T.E.

-: LOCATION AT :-

MOUZA- BANIAKHARI, J.L.-55,
PLOT NO.-R.S. 76, 77, 78, 92 & L.R. 302, 303, 304, 320 &
MOUZA- GURIA J.L.-56,
PLOT NO.-R.S. 369 & L.R. 1001
P.S.- MATIGARA DIST.- DARJEELING ,

-:CLIENTS:-

TULSA TIRUMALA HOUSING LLP
REPRESENTED BY: - PATRIK GARG (1ST PARTNER)
TIRUPATI ASSETS PVT. LTD (2ND PARTNER)

INVESTIGATOR

ACHARYA ASSOCIATES

GEO-TECHNICAL SOIL INVESTIGATION, MATERIAL TESTING SURVEYING (DIGITAL), PLANNING AND ESTIMATING
35, DINABANDHU MITRA SARANI, SUBHASPALLY, SILIGURI.
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CONTENTS

INTRODUCTION AND SCOPE :

Soil investigation has been carried out at Nischintapur T.E. for the purpose of designing suitable foundation for the ROW HOUSING PROJECT.

The objective of the exploration work was to determine the probable sub surface conditions such as stratification, denseness or hardness of the strata, position of ground water table etc. and to evaluate probable range of safe bearing capacity for preparing safe and economic design of foundation.

The plot is more or less level and the spot is same from existing road level. Fourteen 150 mm dia bore holes were taken down to a depth of 8 m below the existing ground level at the site as per location shown in the site plan. Auger boring and bentonite mud drilling were used for drilling the holes. Standard Penetration Test was done on the soil at different depth.

Laboratory testing on selected undisturbed/representative soil samples were done for classification purpose and to determine their strength & other physical properties.

THE FOLLOWING TESTS WERE DONE FOR DETAILS SOIL INVESTIGATION:-

(A) FIELD TESTS:

1. Standard penetration tests.
2. Determination of In-Situ density.

(B) LABORATORY TESTS:

1. Natural moisture content
2. Specific Gravity
3. Grain size analysis.

1. Standard Penetration Tests :-

A standard split spoon sampler is driven 45 cm into the ground by means of a 63.5 kg hammer falling freely from a height of 75 cm. The total number of blows required to drive the second and third depth of 15 cm
(i.e. total 30 cm) is called the standard Penetration resistance (N blows per 30 cm). After the blow counts are recorded, the spoon is withdrawn and a representative sample is obtained for identification tests. The N value has been corrected as per IS: 2123-1981.

Corrections:

a) Due to Overburden – The N value for cohesion less soil shall be corrected for overburden (N').

b) Due to Dilatancy – The value obtained after correction due to overburden shall be corrected for dialatancy if the stratum consists of fine sand and silt below water table for values of N' greater than 15, as under (N"):

$$N" = 15 + \tfrac{1}{2} (N' - 15)$$

2. Determination of In-Situ density:

The in-situ density of soil is determined by core cutter method as per IS: 2720 (Part XXIX) - 1975.

(B) LABORATORY TESTS:

The soil samples collected from the bore holes during field Investigation were sent to the laboratory for determination of soil classification and physical properties.

The following laboratory tests were conducted on soil sample.

1. **Natural moisture content**: It is the ratio of weight of water in the voids to the weight of solids. It is expressed as percentage.

It is determined in the laboratory by Oven drying method as per IS: 2720 (Part-II)-1973. In this method the soil sample (collected in the air tight polythene pack) is dried in thermostatically controlled oven at 105-110°C for 24 hours.

2. **Specific Gravity:** Specific gravity is the ratio of the weight in air of a given volume of a material at a standard temperature to the weight in air of an equal volume of distilled water at the same stated temperature.

The specific gravity of soil sample is determined by density bottle method as per IS: 2720 (Part III/Sec 1) - 1980.

3. Shear Strength test: When an external load is applied on a soil mass, shearing stresses are induced in it. If the shear stress developed on any plane in the soil exceeds a certain limiting value, failure of the soil occurs.

The maximum shear stress which a given soil can withstand is called its shear strength.

The factors governing the shear strength of a soil are:

(a) Internal friction.

(b) Cohesion.

As it is seen from two no's bore log data sheet that the average soil strata at 2 to 4 m is fine, medium & coarse sand, which is **cohesion less(C=0)**, so **shear parameter angle of internal friction (Ø) is found out from correlation between angle of internal friction and corrected SPT value as per IS 6403 : 1981.**

Unconfined Compression test and Vane Shear test is applicable for pure forms of clay.

2. **Grain size analysis :**

The soil samples collected from the different depths were used for determination of Grain Size analysis. This is determined in the laboratory by the mechanical analysis, which consists of:

(a) Dry mechanical analysis or sieve analysis.[IS-2720 (Part-4)- 1985]

(b) Wet mechanical analysis or hydrometer analysis. [IS-2720 (Part-4)- 1985]

Determination of Net Safe Bearing Capacity of Soil:

Net Safe Bearing capacity of soil is determined considering the following two aspects:

1. **Shear failure of soil as per IS:6403-1981**: Under this aspect calculations are made for both General Shear failure and Local Shear failure and appropriate value of the either, or a interpolated value as per void ratio is determined as the net safe bearing capacity from shear failure point of view.

2. **Allowable settlement as per IS: 8009 (Part-1)-1986:** Maximum permissible settlement for R.C.C. structure and the type of soil as mentioned in the report(sandy) is 50mm as per IS: 8009 (Part-1)-1986. In the present case considering all aspects, allowable settlement as indicated in the Net allowable bearing capacity Table has been assumed to determine the Net Safe bearing capacity by the formula suggested by Bowles(1988):

Net Safe Bearing Capacity = $48N_{cor}R_d\,(B+.33]/2)^2\,S_aR_w$

Where

N_{cor}= Design N (SPT) Value

S_a= Allowable Settlement

R_d= Depth Correction Factor =

B= Width of Footing

R_w= Water Table Correction

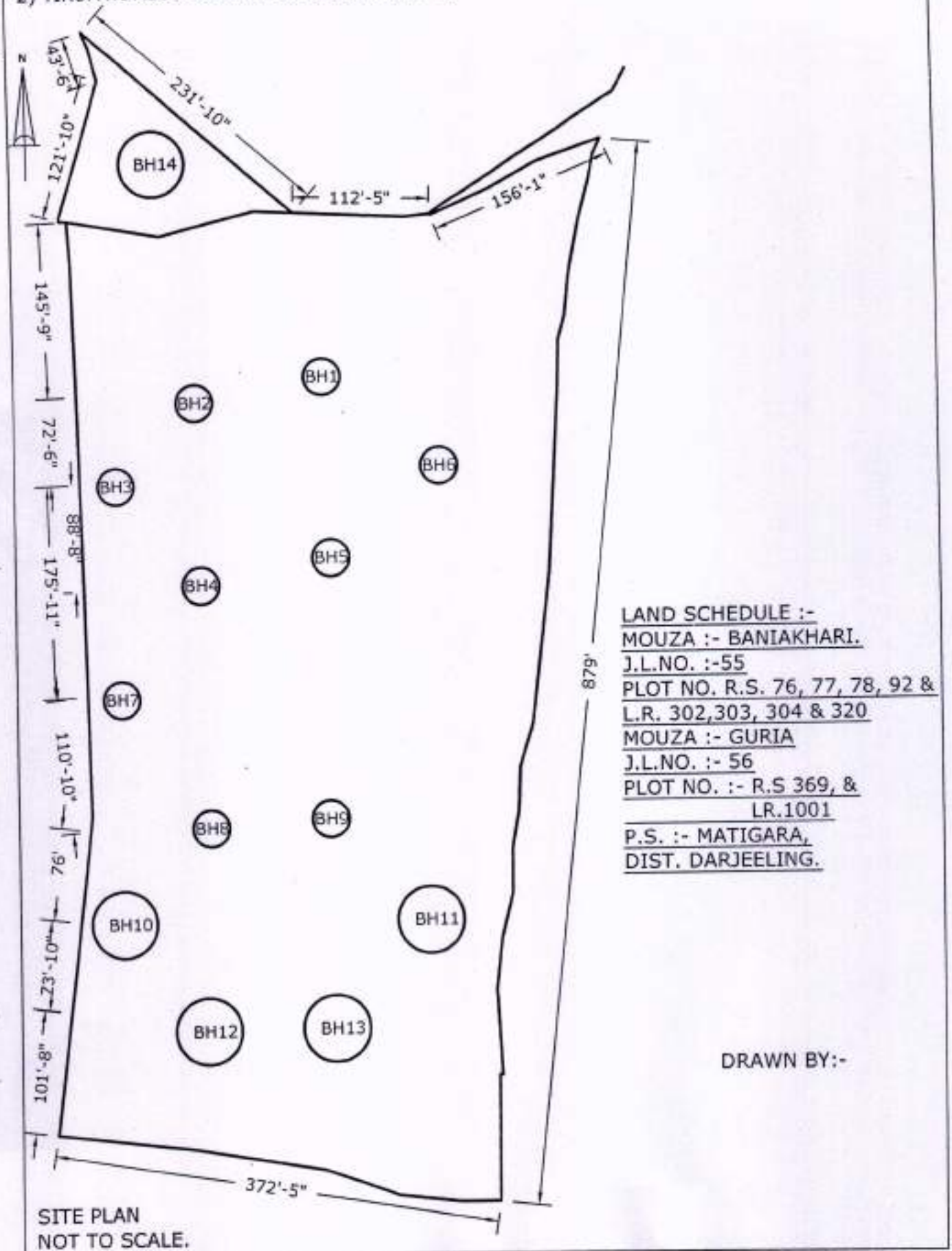
The **Net allowable bearing capacity** is taken as the lesser of the two values determined considering the above two aspects.

The calculations are shown in table- 15, 16, 17, 18, & 19.

SITE PLAN SHOWING THE PIN POINT BOREHOLE LOCATION
FOR CONSTRUCTION OF ROW HOUSING PROJECT AT NISCHINTAPUR T.E.

NAME OF THE CLIENT:-
1) TULSA TIRUMALA HOUSING LLP
REPRESENTED BY:- PRATIK GARG(1ST PARTNER)
2) TIRUPATI ASSETS PVT. LTD. (2ND PARTNER)

NOTE :- (BH) = BORE HOLE LOCATION.



LAND SCHEDULE :-
MOUZA :- BANIAKHARI.
J.L.NO. :-55
PLOT NO. R.S. 76, 77, 78, 92 &
L.R. 302,303, 304 & 320
MOUZA :- GURIA
J.L.NO. :- 56
PLOT NO. :- R.S 369, &
LR.1001
P.S. :- MATIGARA,
DIST. DARJEELING.

DRAWN BY:-

SITE PLAN
NOT TO SCALE.

Table-1

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 10/01/2020	COMPLETED ON : 10/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 1	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	36	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	41	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	55	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	62	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	74	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	91	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	108	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

Table-2

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 10/01/2020	COMPLETED ON : 10/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 2	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	29	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	45	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	56	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	65	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	76	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	89	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	98	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

Table-3

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 3	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	23	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	37	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	49	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	60	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	70	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	88	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	100	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

Table-4

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 4	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	35	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	41	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	51	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	62	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	77	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	90	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	102	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-5

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 5	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	25	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	35	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	49	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	60	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	74	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	95	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	108	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-6

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 12/01/2020	COMPLETED ON : 12/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 6	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	21	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	22	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	52	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	62	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	71	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	87	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	96	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

Table-7

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 12/01/2020	COMPLETED ON : 12/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 7	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	19	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	37	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	53	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	69	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	79	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	89	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	99	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-8

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 10/01/2020	COMPLETED ON : 10/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 8	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	13	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	20	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	49	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	67	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	73	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	91	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	105	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-9

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 10/01/2020	COMPLETED ON : 10/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 9	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	41	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	59	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	66	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	72	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	80	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	95	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	103	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-10

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 10	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	36	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	45	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	55	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	60	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	72	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	95	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	108	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

Table-11

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 11	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	34	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	42	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	51	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	62	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	79	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	91	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	101	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-12

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 11/01/2020	COMPLETED ON : 11/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 12	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	18	P	P-I/1	2.15-2.45
Do		3.00	3.45	0.45	39	P	P-I/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	45	P	P-I/3	4.15-4.45
Do		5.00	5.45	0.45	61	P	P-I/4	5.15-5.45
Do		6.00	6.45	0.45	70	P	P-I/5	6.15-6.45
Do		7.00	7.45	0.45	92	P	P-I/6	7.15-7.45
Do		8.00	8.45	0.45	101	P	P-I/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL	No. of UDS : NIL	No. of Vane Test : NIL
No. of Large Diameter Sample : NIL	No. of S.P.T. : SEVEN (07)	No. of Water Sample : NIL

Table-13

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING	BORE HOLE NO. 13	
SHELL & AUGER	150 MM	BMD	GROUND/ BED RL	The spot is same from road level.
TERMINATION DEPTH	8.00 m		LOCATION	
COMMENCED ON : 12/01/2020	COMPLETED ON : 12/01/2020		Nishit pur T.E	
GROUND WATER LEVEL	4.65m down from G.L.			

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	16	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	31	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	49	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	65	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	74	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	89	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	107	P	P-II/7	8.15-8.45

Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL
No. of Large Diameter Sample : NIL
No. of UDS : NIL
No. of S.P.T. : SEVEN (07)
No. of Vane Test : NIL
No. of Water Sample : NIL

Table-14

BORE LOG DATA SHEET

TYPE OF BORING	DIA OF BORE	TYPE OF DRILLING
SHELL & AUGER	150 MM	BMD
TERMINATION DEPTH	8.00 m	
COMMENCED ON : 12/01/2020	COMPLETED ON : 12/01/2020	
GROUND WATER LEVEL	4.65m down from G.L.	

BORE HOLE NO. 14	
GROUND/ BED RL	The spot is same from road level.
LOCATION	
Nishit pur T.E	

DESCRIPTION OF STRATA	LEGEND	FROM	TO	Thickness	N	SAMPLES		DEPTH
		m	m	m	Value	Type	Ref. No.	M
Silty fine,medium & coarse sand with gravel grey in colour.		2.00	2.45	0.45	20	P	P-II/1	2.15-2.45
Do		3.00	3.45	0.45	39	P	P-II/2	3.15-3.45
Fine,medium ,coarse sand with gravel and cobble grey in colour.		4.00	4.45	0.45	51	P	P-II/3	4.15-4.45
Do		5.00	5.45	0.45	61	P	P-II/4	5.15-5.45
Do		6.00	6.45	0.45	70	P	P-II/5	6.15-6.45
Do		7.00	7.45	0.45	89	P	P-II/6	7.15-7.45
Do		8.00	8.45	0.45	102	P	P-II/7	8.15-8.45

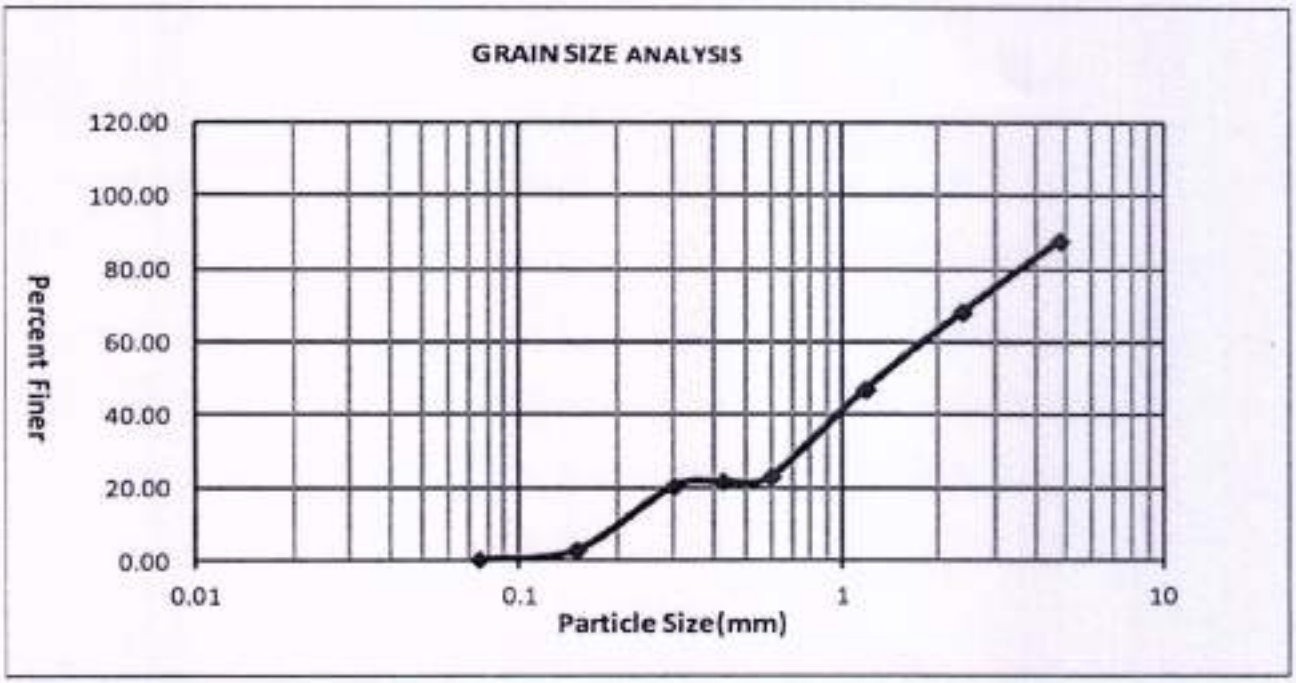
Code : U-Undisturbed sample, D – Disturbed Sample, L – Large Diameter, C – Core
W-Water Sample, P-Penetration. Test, V – Vane Shear Test

No. of disturbed Sample : NIL No. of UDS : NIL No. of Vane Test : NIL
No. of Large Diameter Sample : NIL No. of S.P.T. : SEVEN (07) No. of Water Sample : NIL

GRAIN SIZE ANALYSIS OF BORE HOLE 1 AT DEPTH 2 M

Total wt of sample = 160.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	443.6	19.4	12.11	12.11	87.89
2.36	377.8	409	31.2	19.48	31.59	68.41
1.18	342	376	34	21.22	52.81	47.19
0.6	363.8	402.4	38.6	24.09	76.90	23.10
0.425	321.4	323.4	2	1.25	78.15	21.85
0.3	345.6	347.8	2.2	1.37	79.53	20.47
0.15	346.2	374.4	28.2	17.60	97.13	2.87
0.075	338	342	4	2.50	99.63	0.37
PAN			0.6			



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.37	21.47	46.57	19.48	12.11

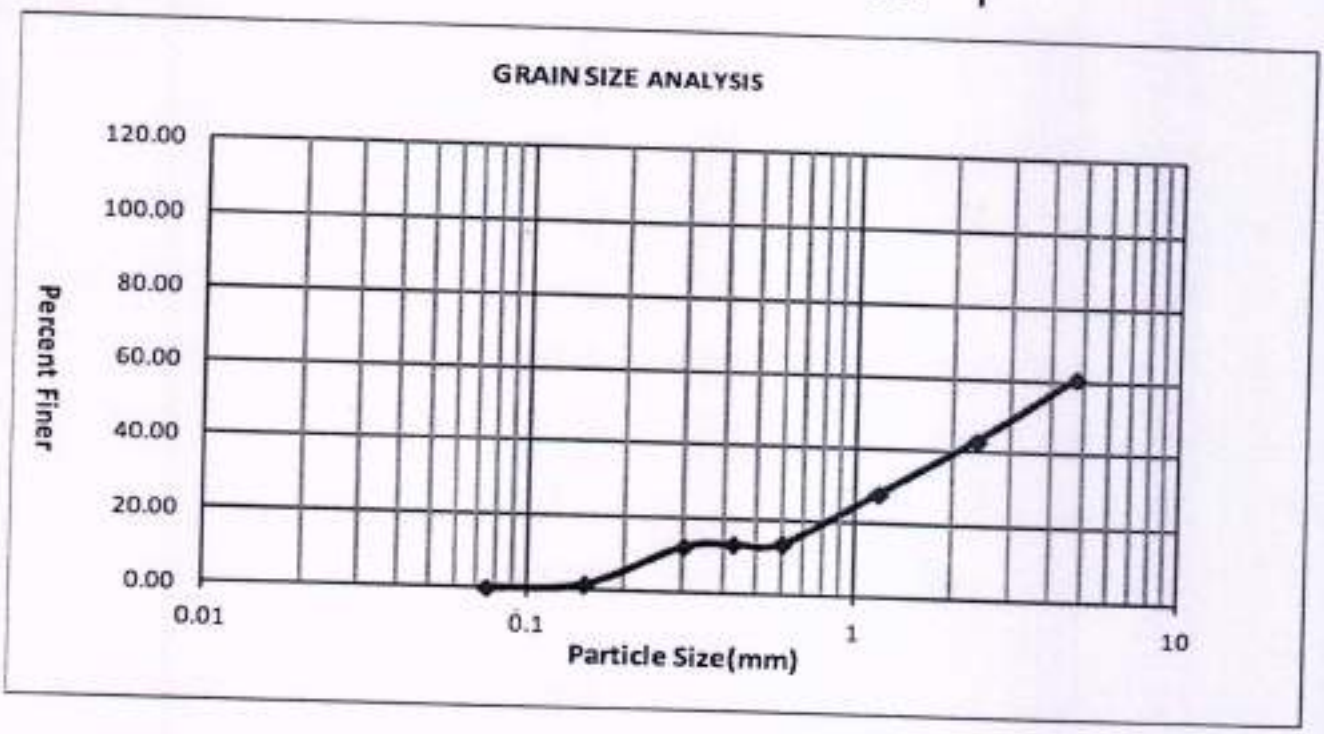
100

Uniformity Co-efficient(Cu)	=	D60/D10	8.98
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	1.47
SOIL IS WELL GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 2 AT DEPTH 2 M

Total wt of sample 166 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	489.6	65.4	39.40	39.40	60.60
2.36	377.8	406.8	29	17.47	56.87	43.13
1.18	342	367	25	15.06	71.93	28.07
0.6	363.8	387.4	23.6	14.22	86.14	13.86
0.425	321.4	322	0.6	0.36	86.51	13.49
0.3	345.6	347.2	1.6	0.96	87.47	12.53
0.15	346.2	364.2	18	10.84	98.31	1.69
0.075	338	340.4	2.4	1.45	99.76	0.24
PAN			0.4	0.24		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.24	13.25	29.64	17.47	39.40

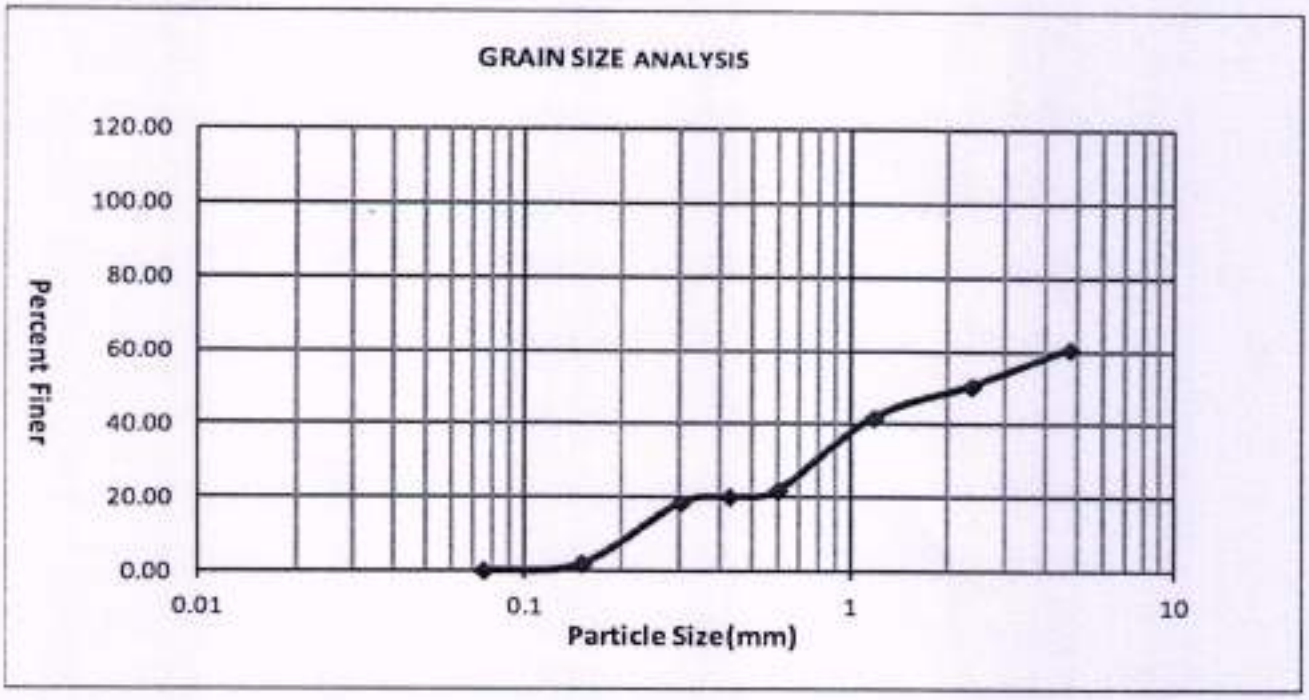
100

Uniformity Co-efficient(Cu) =D60/D10 D60/D10	17.61
Co-efficient of Curvature(Cc) = (D30)2/(D60*D10)	1.43
SOIL IS WELL GRADED SANDY SOIL	

GRAIN SIZE ANALYSIS OF BORE HOLE 3 AT DEPTH 2 M

Total wt of sample 151.6 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	483.8	59.6	39.31	39.31	60.69
2.36	377.8	393	15.2	10.03	49.34	50.66
1.18	342	355.2	13.2	8.71	58.05	41.95
0.6	363.8	394	30.2	19.92	77.97	22.03
0.425	321.4	324	2.6	1.72	79.68	20.32
0.3	345.6	348.2	2.6	1.72	81.40	18.60
0.15	346.2	371	24.8	16.36	97.76	2.24
0.075	338	341	3	1.98	99.74	0.26
PAN			0.4	0.26		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.26	20.05	30.34	10.03	39.31

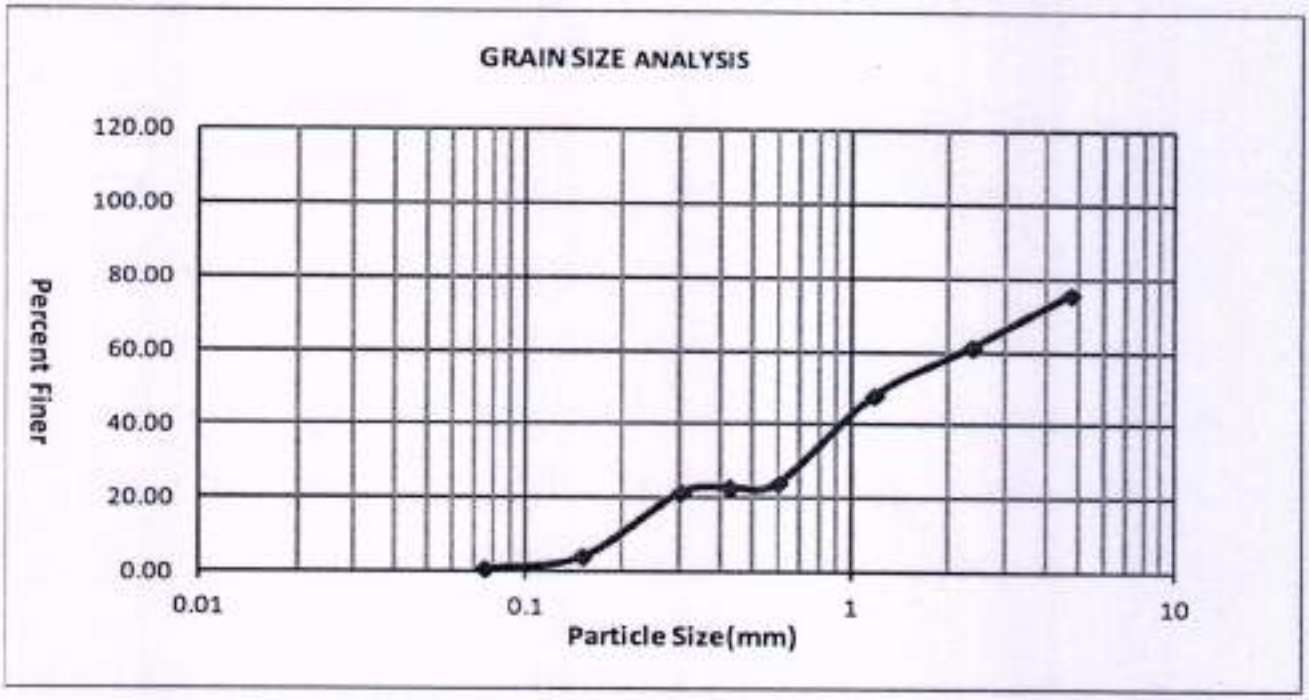
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	20.74
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.68
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 4 AT DEPTH 2 M

Total wt of sample 179.8 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	468	43.8	24.36	24.36	75.64
2.36	377.8	403.6	25.8	14.35	38.71	61.29
1.18	342	366	24	13.35	52.06	47.94
0.6	363.8	406.8	43	23.92	75.97	24.03
0.425	321.4	323.4	2	1.11	77.09	22.91
0.3	345.6	348.2	2.6	1.45	78.53	21.47
0.15	346.2	377.4	31.2	17.35	95.88	4.12
0.075	338	343.8	5.8	3.23	99.11	0.89
PAN			1.6	0.89		

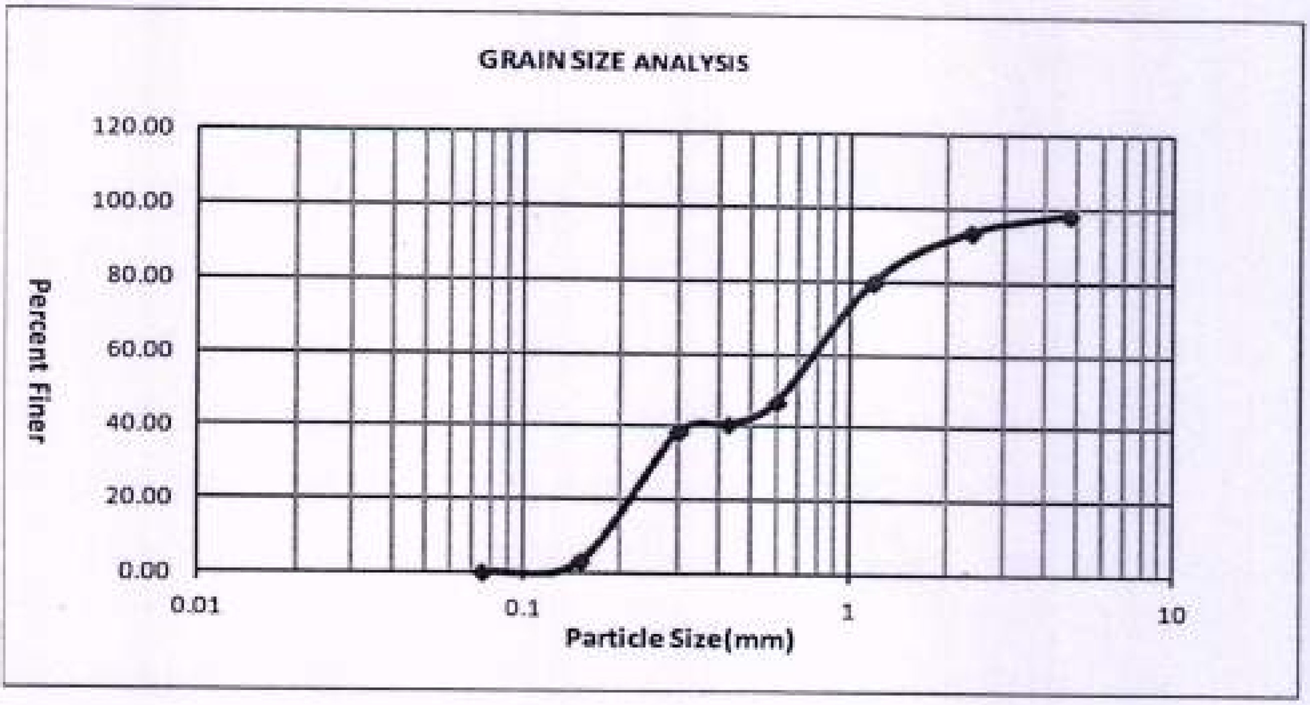


CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.89	22.02	38.38	14.35	24.36

100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	11.18
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	1.23
SOIL IS WELL GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 5 AT DEPTH 2 M						
Total wt of sample		161.8 gm				
Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	427	2.8	1.73	1.73	98.27
2.36	377.8	385.6	7.8	4.82	6.55	93.45
1.18	342	364.2	22.2	13.72	20.27	79.73
0.6	363.8	417	53.2	32.88	53.15	46.85
0.425	321.4	331.2	9.8	6.06	59.21	40.79
0.3	345.6	349	3.4	2.10	61.31	38.69
0.15	346.2	403.4	57.2	35.35	96.66	3.34
0.075	338	343	5	3.09	99.75	0.25
PAN			0.4	0.25		



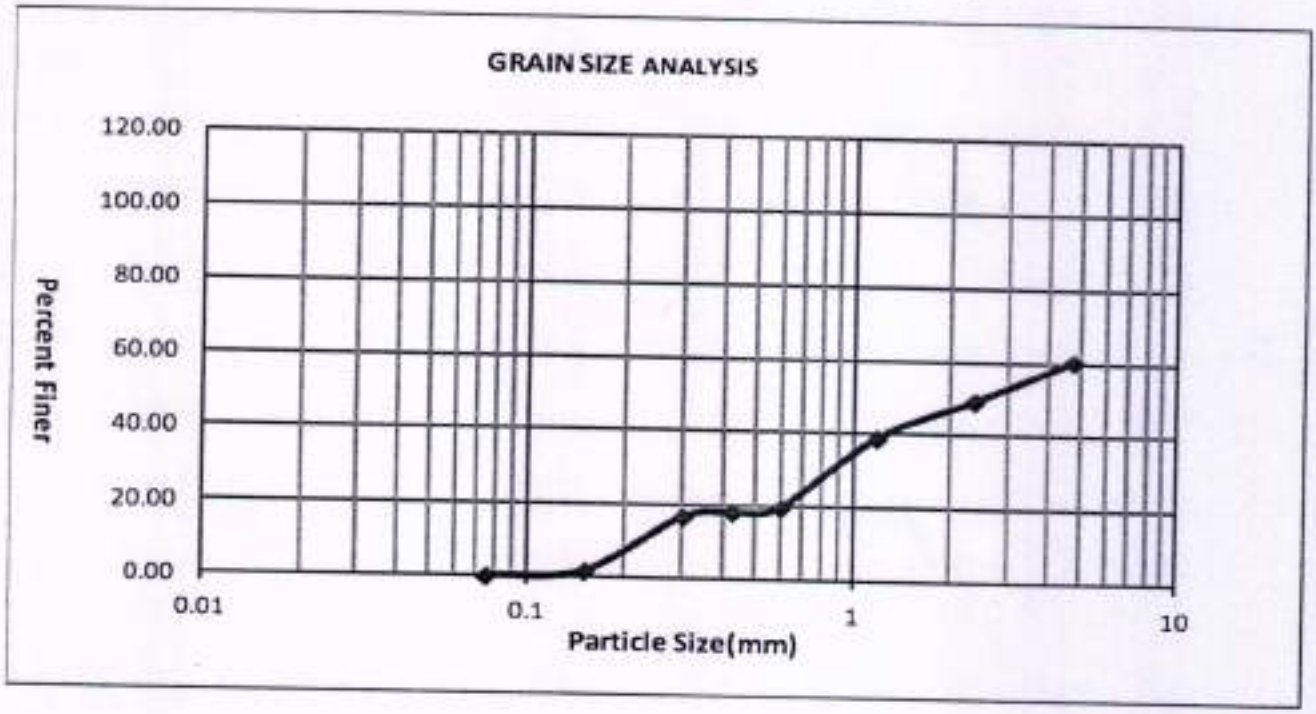
CLAY %	SILT %	SAND %			GRAVEL %	
		FINE %	MEDIUM %	COARSE %		
0	0.25	40.54	52.66	4.82	1.73	100

Uniformity Co-efficient(Cu) =D60/D10	D60/D10	4.67
Co-efficient of Curvature(Cc) =	(D30)2/(D60*D10)	0.47
SOIL IS POORLY GRADED SANDY SOIL		

GRAIN SIZE ANALYSIS OF BORE HOLE 6 AT DEPTH 2 M

Total wt of sample 149.6 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	483.4	59.2	39.57	39.57	60.43
2.36	377.8	394.4	16.6	11.10	50.67	49.33
1.18	342	357.6	15.6	10.43	61.10	38.90
0.6	363.8	392.4	28.6	19.12	80.21	19.79
0.425	321.4	323.6	2.2	1.47	81.68	18.32
0.3	345.6	347.6	2	1.34	83.02	16.98
0.15	346.2	369	22.8	15.24	98.26	1.74
0.075	338	340.4	2.4	1.60	99.87	0.13
PAN			0.2	0.13		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.13	18.18	31.02	11.10	39.57

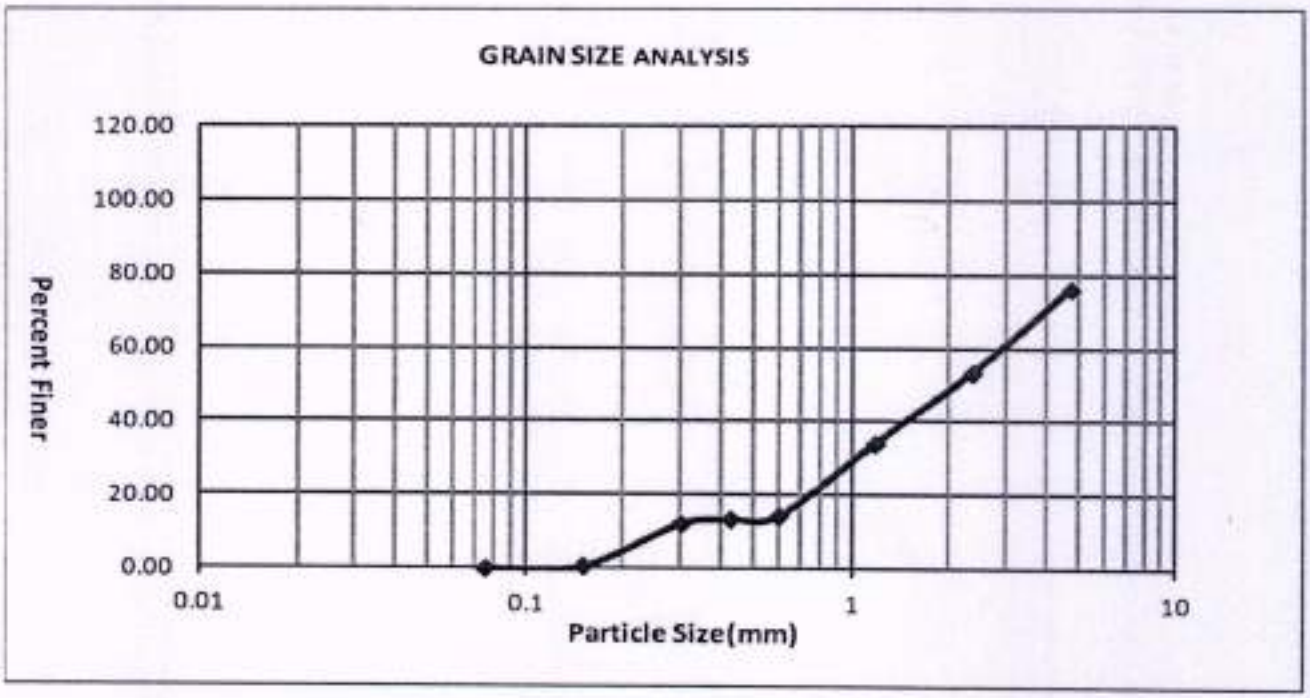
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	20.14
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.77
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 7 AT DEPTH 2 M

Total wt of sample 144.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	458.6	34.4	23.86	23.86	76.14
2.36	377.8	410.6	32.8	22.75	46.60	53.40
1.18	342	369.8	27.8	19.28	65.88	34.12
0.6	363.8	392.2	28.4	19.69	85.58	14.42
0.425	321.4	322.6	1.2	0.83	86.41	13.59
0.3	345.6	347.4	1.8	1.25	87.66	12.34
0.15	346.2	362.8	16.6	11.51	99.17	0.83
0.075	338	339	1	0.69	99.86	0.14
PAN			0.2	0.14		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.14	13.45	39.81	22.75	23.86

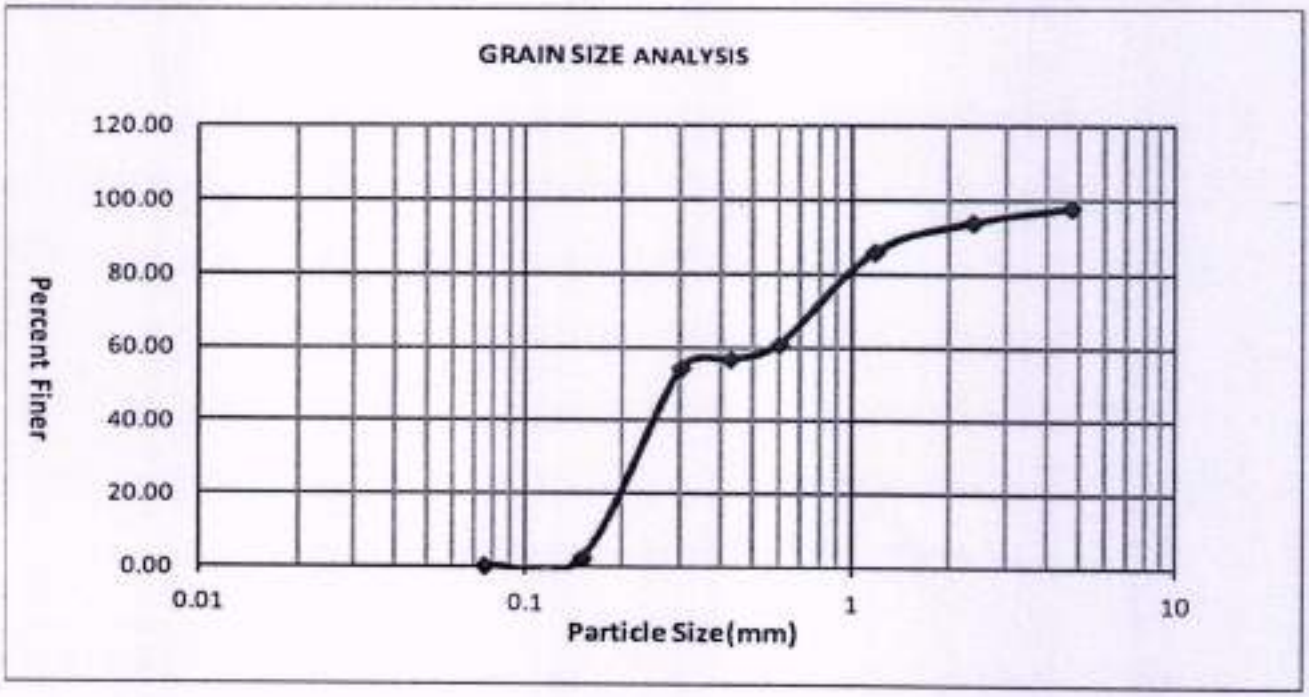
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	11.33
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	1.36
SOIL IS WELL GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 8 AT DEPTH 2 M

Total wt of sample 120.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	426.6	2.4	2.00	2.00	98.00
2.36	377.8	382.6	4.8	3.99	5.99	94.01
1.18	342	351.6	9.6	7.99	13.98	86.02
0.6	363.8	394	30.2	25.12	39.10	60.90
0.425	321.4	326.2	4.8	3.99	43.09	56.91
0.3	345.6	348.6	3	2.50	45.59	54.41
0.15	346.2	408.4	62.2	51.75	97.34	2.66
0.075	338	340.6	2.6	2.16	99.50	0.50
PAN			0.6	0.50		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.50	56.41	37.10	3.99	2.00

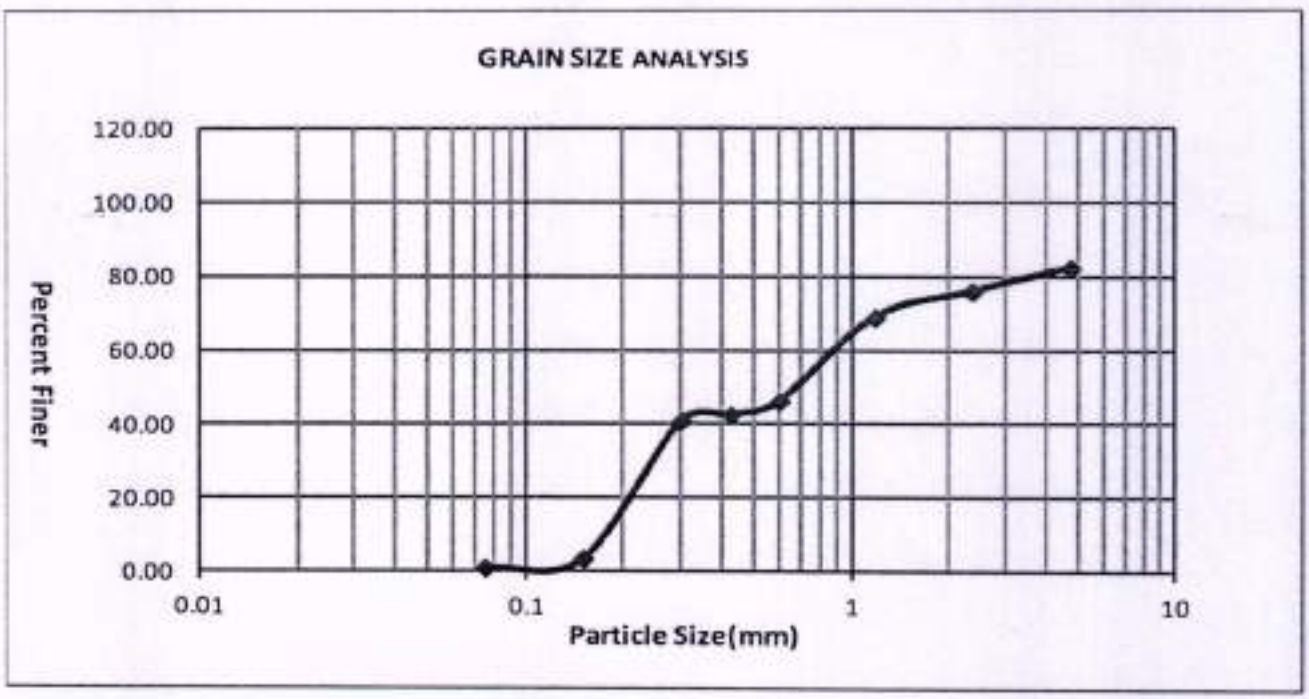
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	3.27
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.55
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 9 AT DEPTH 2 M

Total wt of sample 160.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	452.6	28.4	17.73	17.73	82.27
2.36	377.8	388	10.2	6.37	24.09	75.91
1.18	342	353.2	11.2	6.99	31.09	68.91
0.6	363.8	400.2	36.4	22.72	53.81	46.19
0.425	321.4	327	5.6	3.50	57.30	42.70
0.3	345.6	348.4	2.8	1.75	59.05	40.95
0.15	346.2	406	59.8	37.33	96.38	3.62
0.075	338	342	4	2.50	98.88	1.12
PAN			1.8	1.12		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	1.12	41.57	33.21	6.37	17.73

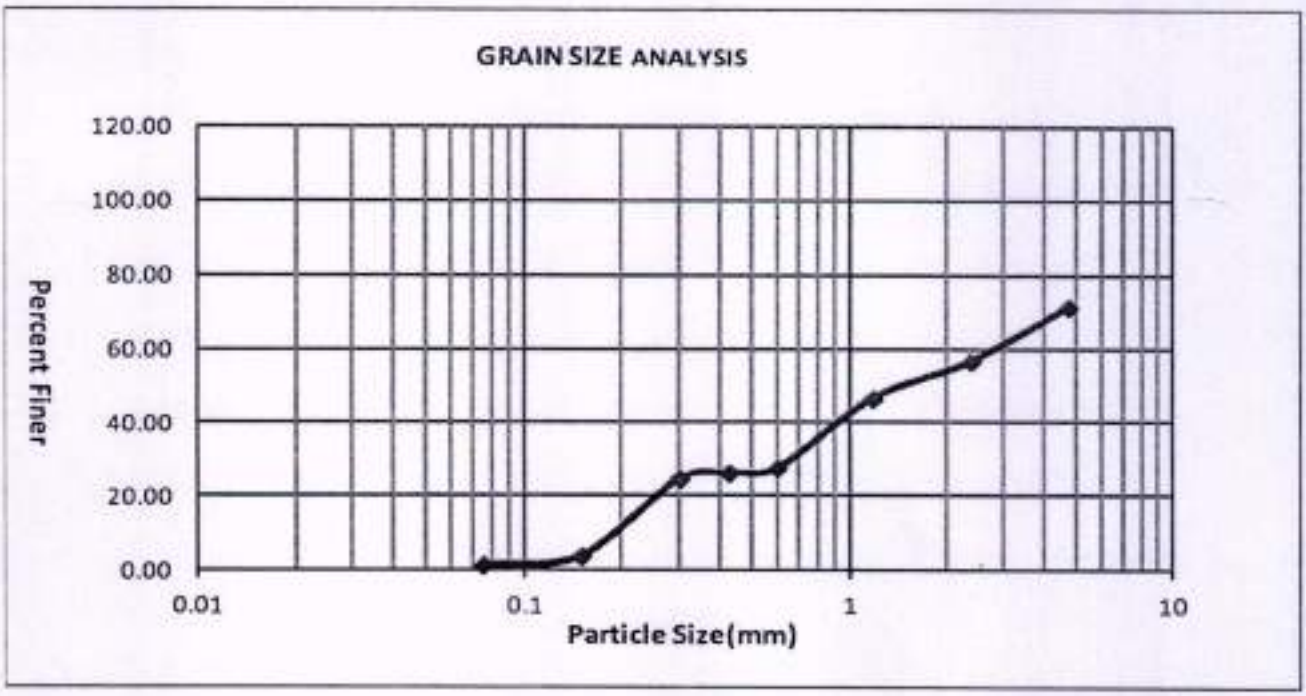
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	5.42
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.39
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 10 AT DEPTH 2 M

Total wt of sample 124 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	459.6	35.4	28.55	28.55	71.45
2.36	377.8	396.2	18.4	14.84	43.39	56.61
1.18	342	354.4	12.4	10.00	53.39	46.61
0.6	363.8	387.4	23.6	19.03	72.42	27.58
0.425	321.4	323	1.6	1.29	73.71	26.29
0.3	345.6	347.6	2	1.61	75.32	24.68
0.15	346.2	372	25.8	20.81	96.13	3.87
0.075	338	341	3	2.42	98.55	1.45
PAN			1.8	1.45		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	1.45	24.84	30.32	14.84	28.55

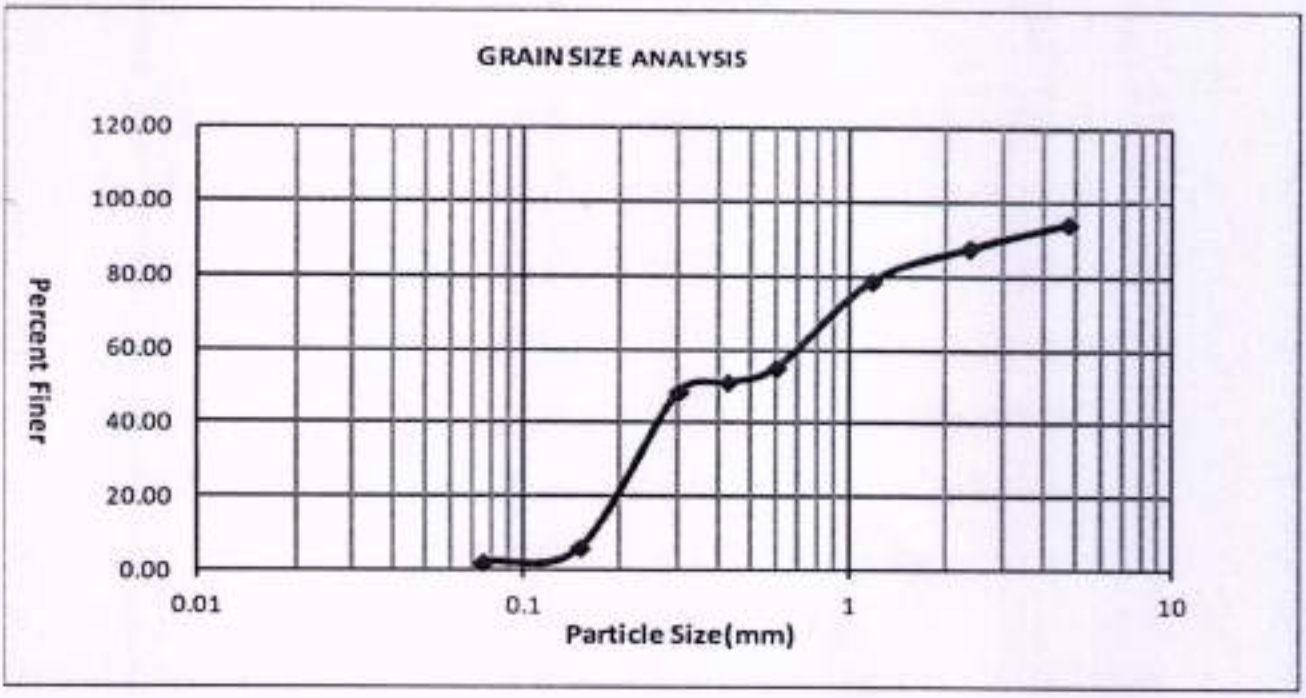
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	14.96
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.80
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 11 AT DEPTH 2 M

Total wt of sample 156.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	433.2	9	5.76	5.76	94.24
2.36	377.8	388.2	10.4	6.66	12.42	87.58
1.18	342	356	14	8.96	21.38	78.62
0.6	363.8	400.4	36.6	23.43	44.81	55.19
0.425	321.4	327.6	6.2	3.97	48.78	51.22
0.3	345.6	349.8	4.2	2.69	51.47	48.53
0.15	346.2	412.4	66.2	42.38	93.85	6.15
0.075	338	344.2	6.2	3.97	97.82	2.18
PAN			3.4	2.18		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	2.18	49.04	36.36	6.66	5.76

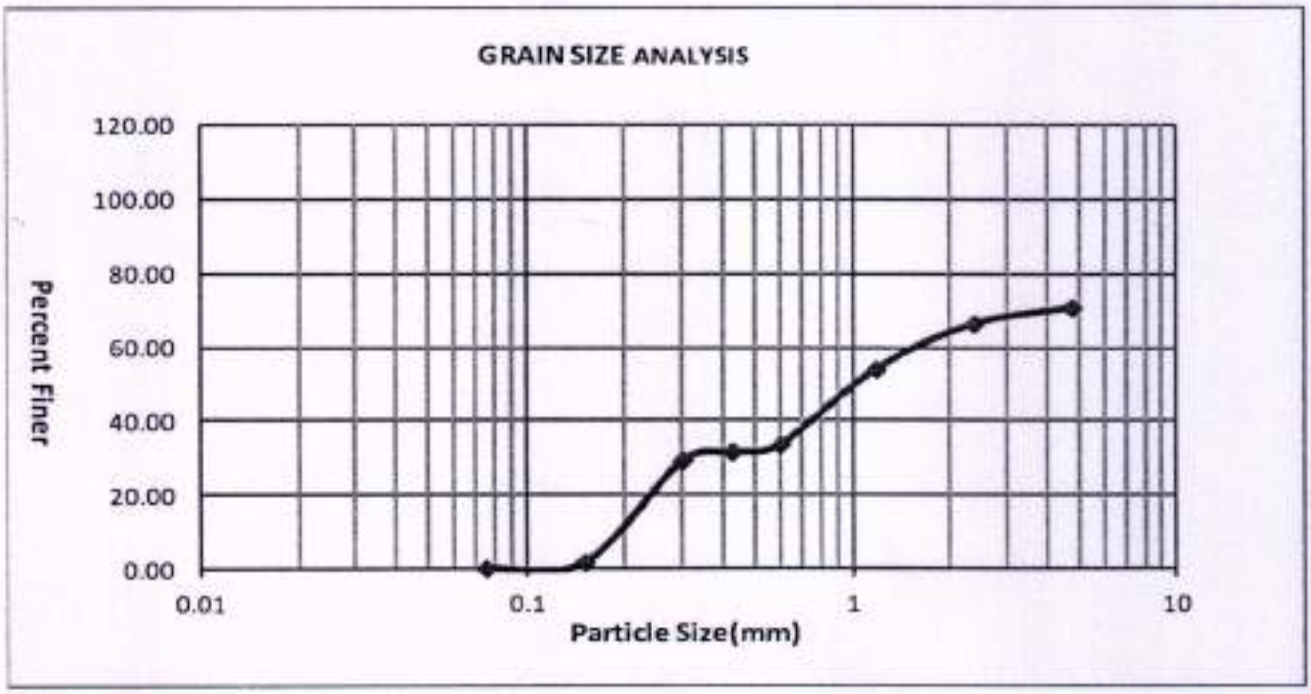
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	4.39
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.47
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 12 AT DEPTH 2 M

Total wt of sample 137 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	464	39.8	29.05	29.05	70.95
2.36	377.8	383.8	6	4.38	33.43	66.57
1.18	342	359	17	12.41	45.84	54.16
0.6	363.8	391.8	28	20.44	66.28	33.72
0.425	321.4	324	2.6	1.90	68.18	31.82
0.3	345.6	348.8	3.2	2.34	70.51	29.49
0.15	346.2	384	37.8	27.59	98.10	1.90
0.075	338	340.2	2.2	1.61	99.71	0.29
PAN			0.4	0.29		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	0.29	31.53	34.74	4.38	29.05

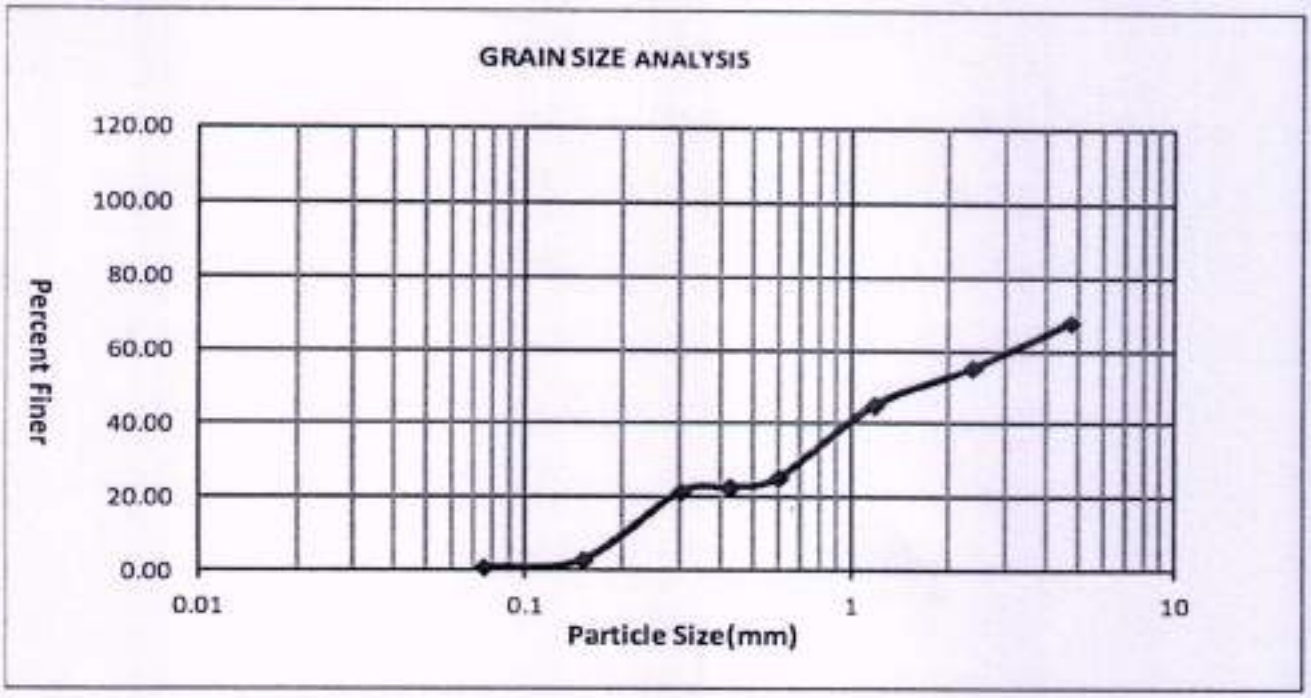
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	8.94
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.32
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 13 AT DEPTH 2 M

Total wt of sample 228.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	497.4	73.2	32.08	32.08	67.92
2.36	377.8	406.6	28.8	12.62	44.70	55.30
1.18	342	365.2	23.2	10.17	54.86	45.14
0.6	363.8	408.8	45	19.72	74.58	25.42
0.425	321.4	327.2	5.8	2.54	77.13	22.87
0.3	345.6	348.4	2.8	1.23	78.35	21.65
0.15	346.2	388.8	42.6	18.67	97.02	2.98
0.075	338	342.4	4.4	1.93	98.95	1.05
PAN			2.4	1.05		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	1.05	21.82	32.43	12.62	32.08

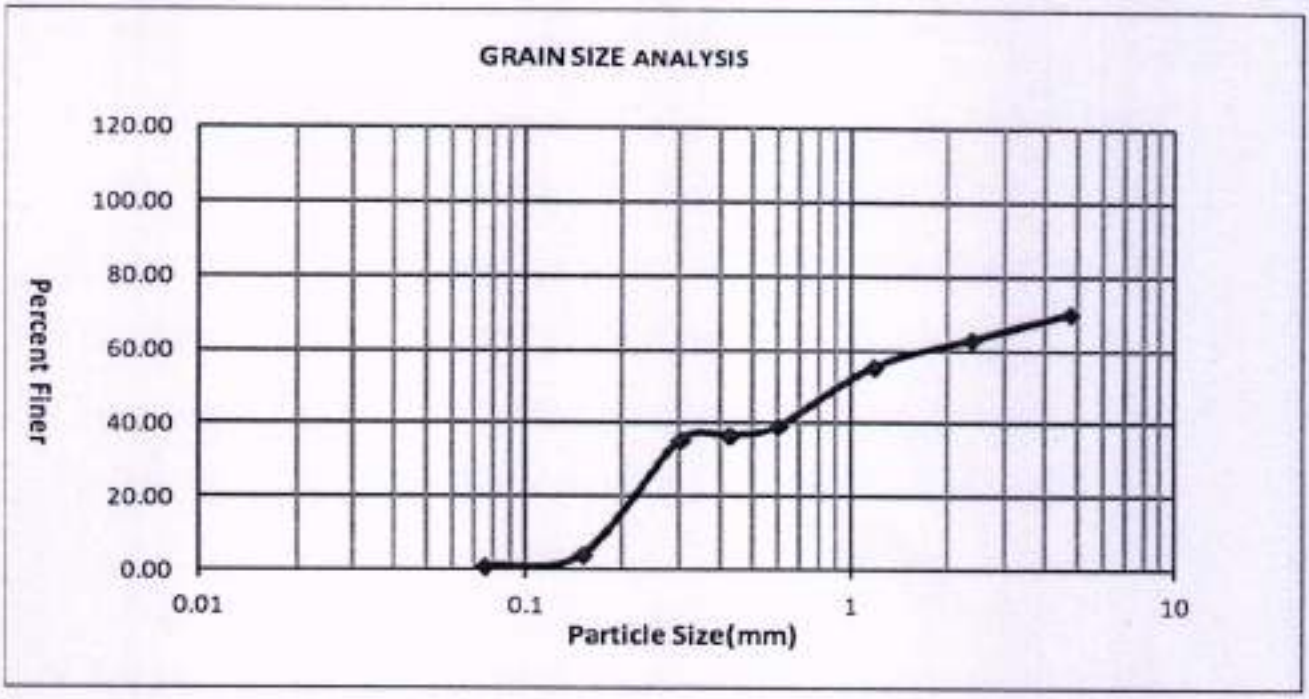
100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	15.74
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.81
SOIL IS POORLY GRADED SANDY SOIL			

GRAIN SIZE ANALYSIS OF BORE HOLE 14 AT DEPTH 2 M

Total wt of sample 194.2 gm

Sieve size	Wt. of Sieve	Wt.of Sieve + soil	Wt. of soil	Percent retained	Cumulative percent retained	Percent finer
mm	gm	gm	gm	(%)	(%)	(%)
4.75	424.2	482.6	58.4	30.07	30.07	69.93
2.36	377.8	391.2	13.4	6.90	36.97	63.03
1.18	342	356.6	14.6	7.52	44.49	55.51
0.6	363.8	395.4	31.6	16.27	60.76	39.24
0.425	321.4	326	4.6	2.37	63.13	36.87
0.3	345.6	348.4	2.8	1.44	64.57	35.43
0.15	346.2	407	60.8	31.31	95.88	4.12
0.075	338	344	6	3.09	98.97	1.03
PAN			2	1.03		



CLAY %	SILT %	SAND %			GRAVEL %
		FINE %	MEDIUM %	COARSE %	
0	1.03	35.84	26.16	6.90	30.07

100

Uniformity Co-efficient(Cu)	=D60/D10	D60/D10	10.58
Co-efficient of Curvature(Cc)	=	(D30)2/(D60*D10)	0.22
SOIL IS POORLY GRADED SANDY SOIL			

Table-15

ESTIMATED PHYSICAL PROPERTIES OF SOIL		
Depth	2	3
Bulk Density, γ_{bulk}(t/m^3)	1.9	1.9
NatUral Moisture content,w(%)	11.83	14.16
Natural dry density,γ_{dry}(t/m^3)	1.70	1.66
Specific Gravity,G	2.64	2.64
Void Ratio, e	0.55	0.59
Saturated density,γsat(t/m3)	2.06	2.03
Submerged Density γsub(t/m3)	1.06	1.03
Angle of Internal Friction(Ø)	32.88	36.00
Angle of Internal Friction(Ø')	23.41	25.96

Table-16

SPT(N) VALUE CORRECTION							
Depth(M)	Ybulk (gm /cc)	EOP	(C_n).	N	N'	N"	Design N Value
2	1.9	0.38	1.32	13	17.16	16.08	19.50
3	1.9	0.57	1.17	20	23.44	19.22	30.00
4	1.804	0.7216	1.11	45	50.01	32.51	40.31
5	1.804	0.902	1.04	60	62.35	38.68	44.78
6	1.804	1.0824	0.98	70	68.62	41.81	35.11
7	1.804	1.2628	0.94	87	81.51	48.26	32.88
8	1.804	1.4432	0.89	96	85.79	50.39	25.20
9	1.804	1.6236	0.86	0	0.00	0.00	0.00

N = Field N Value(Minimum of all bore holes)

N' = N Value after overburden correction

N" = N Value after Dilatancy correction

EOP = Effective overburden pressure

C_n = Overburden correction

Table-17

Calculation of Net Safe Bearing Capacity as per IS-6403:1981,Based on *General Shear Failure* with Ø determined from Design 'N' value, derived from corrected field N value as per IS- 2131:1981.						
Width (B in metre)	2	3	4	3	4	5
Submerged Density of Soil(t/m3)	1.06	1.06	1.06	1.03	1.03	1.03
Saturated Density of Soil(t/m3)	2.06	2.06	2.06	2.03	2.03	2.03
Depth(D in metre)	2	2	2	3	3	3
Surcharge (q in t/ m2)	2.11	2.11	2.111	3.10	3.10	3.10
Ø(degree)	32.88	32.88	32.88	36.00	36.00	36.00
Water table correction(w')	0.5	0.5	0.5	0.5	0.5	0.5
Shape factors						
sq	1.2	1.2	1.2	1.2	1.2	1.2
s_γ	0.8	0.8	0.8	0.8	0.8	0.8
Depth factors						
d_q	1.17	1.12	1.09	1.17	1.13	1.1
d_γ	1.17	1.12	1.09	1.17	1.13	1.1
Inclination factors						
i_q	1	1	1	1	1	1
i_γ	1	1	1	1	1	1
Bearing capacity factors						
N_q	26.97	26.97	26.97	39.48	39.48	39.48
N_γ	37.14	37.14	37.14	60.31	60.31	60.31
$q.(N_q - 1).s_q.d_q.i_{q\ (t/m2)}$	76.96	73.67	71.70	167.57	161.84	157.55
$0.5.B.\gamma_{sub}.N_\gamma.s_\gamma.d_\gamma.i_\gamma.w'\ (t/m^2)$	35.72	51.30	66.56	86.10	110.88	134.9
Ultimate net bearing capacity(t/m^2)	112.68	124.97	138.3	253.68	272.73	292.5
Factor of safety	3	3	3	3	3	3
Net safe bearing Capacity(t/m^2)	37.56	41.66	46.09	84.56	90.91	97.49

Table-18

Calculation of Net Safe Bearing Capacity as per IS-6403:1981,Based on *Local Shear Failure* with Ø' determined from Design 'N' value, derived from corrected field N value as per IS- 2131:1981.						
Width (B in metre)	2	3	4	3	4	5
Submerged Density of Soil(t/m3)	1.06	1.06	1.06	1.03	1.03	1.03
Saturated Density of Soil(t/m3)	2.06	2.06	2.06	2.03	2.03	2.03
Depth(D in metre)	2	2	2	3	3	3
Surcharge (q in t/ m2)	2.11	2.1109	2.111	3.10	3.10	3.102
Ø'(degree)	23.41	23.41	23.41	25.96	25.96	25.96
Water table correction(w')	0.5	0.5	0.5	0.5	0.5	0.5
Shape factors						
sq	1.2	1.2	1.2	1.2	1.2	1.2
s_γ	0.8	0.8	0.8	0.8	0.8	0.8
Depth factors						
d_q	1.17	1.12	1.09	1.17	1.13	1.1
d_γ	1.17	1.12	1.09	1.17	1.13	1.1
Inclination factors						
i_q	1	1	1	1	1	1
i_γ	1	1	1	1	1	1
Bearing capacity factors						
N'_q	9.31	9.31	9.31	12.14	12.14	12.14
N'_γ	9.14	9.14	9.14	13.08	13.08	13.08
$q.(N'_q -1).s_q.d_q.i_{q\ (t/m2)}$	24.62	23.57	22.94	48.51	46.85	45.61
$0.5.B.\gamma_{sub}.N'_\gamma.s_\gamma.d_\gamma.i_\gamma.w'\ (t/m^2)$	8.79	12.62	16.38	18.68	24.05	29.27
Ultimate net bearing capacity(t/m^2)	33.42	36.19	39.32	67.19	70.91	74.88
Factor of safety	3	3	3	3	3	3
Net safe bearing Capacity(t/m^2)	11.14	12.06	13.11	22.40	23.64	24.96

Table-19

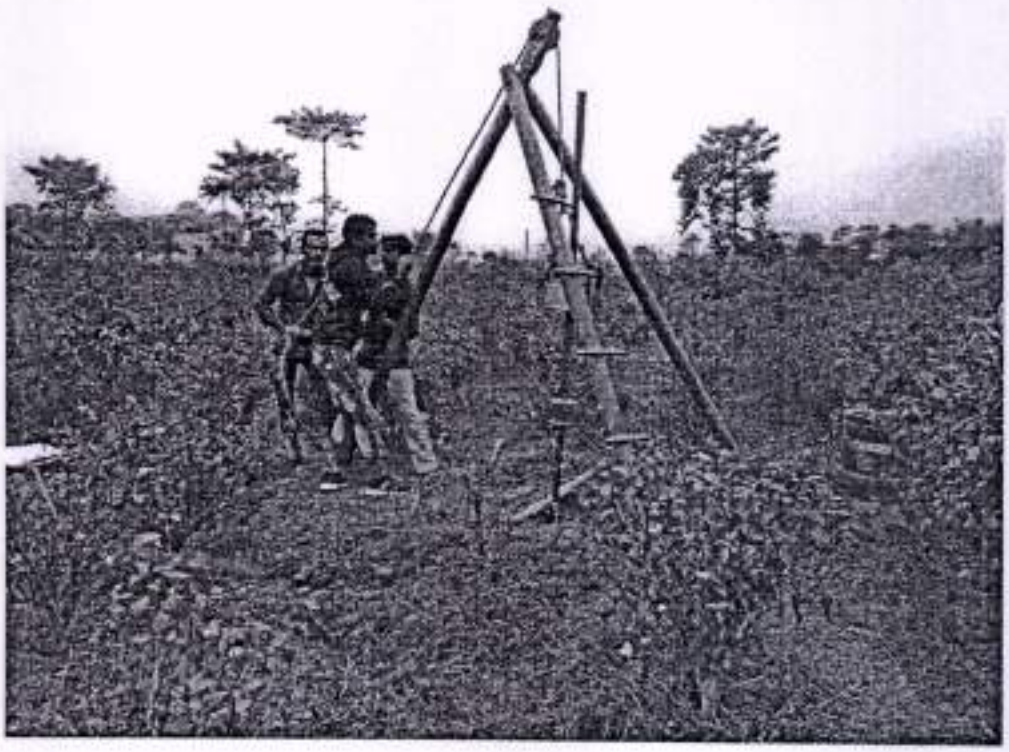
Summary Table of calculation of Net Safe Bearing Capacities based on Shear Failure and Settlement criteria as per Codal Provisions based on which Suggested Net Safe Bearing Capacity has been recommended.

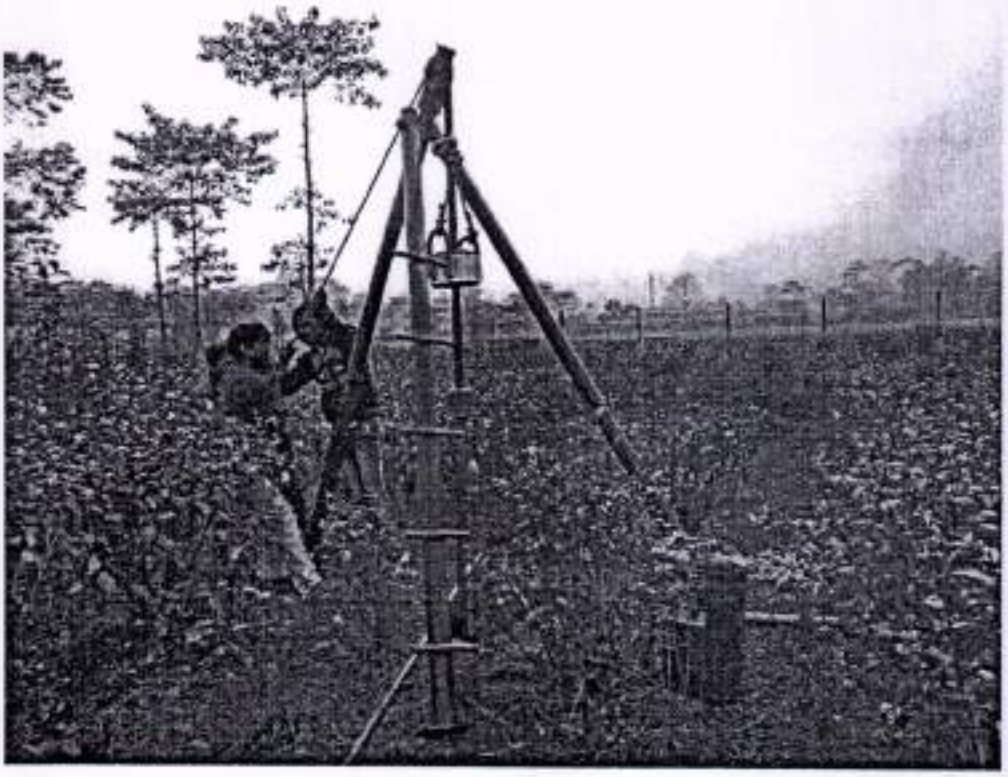
Depth	Width (B) Metre	Length (L)	Net Safe Bearing Capacity Based on General Shear Failure (t/m^2)	Net Safe Bearing Capacity Based on Local Shear Failure (t/m^2)	Void Ratio	Net Safe Bearing Capacity Based on Void Ratio (t/m^2)	Net Safe Bearing Capacity Based on Allowable Settlement (25 to 50mm) (t/m^2)	Suggested Net Safe Bearing Capacity (t/m^2)
2 Metre	2	2	37.56	11.14	0.55	37.05	19.09	**19.09**
	2	3	32.52	9.64	0.55	32.08	19.09	**19.09**
	3	3	41.66	12.06	0.55	41.09	15.90	**15.90**
	3	4	34.93	10.12	0.55	34.45	15.90	**15.90**
	4	4	46.09	13.11	0.55	45.45	14.44	**14.44**

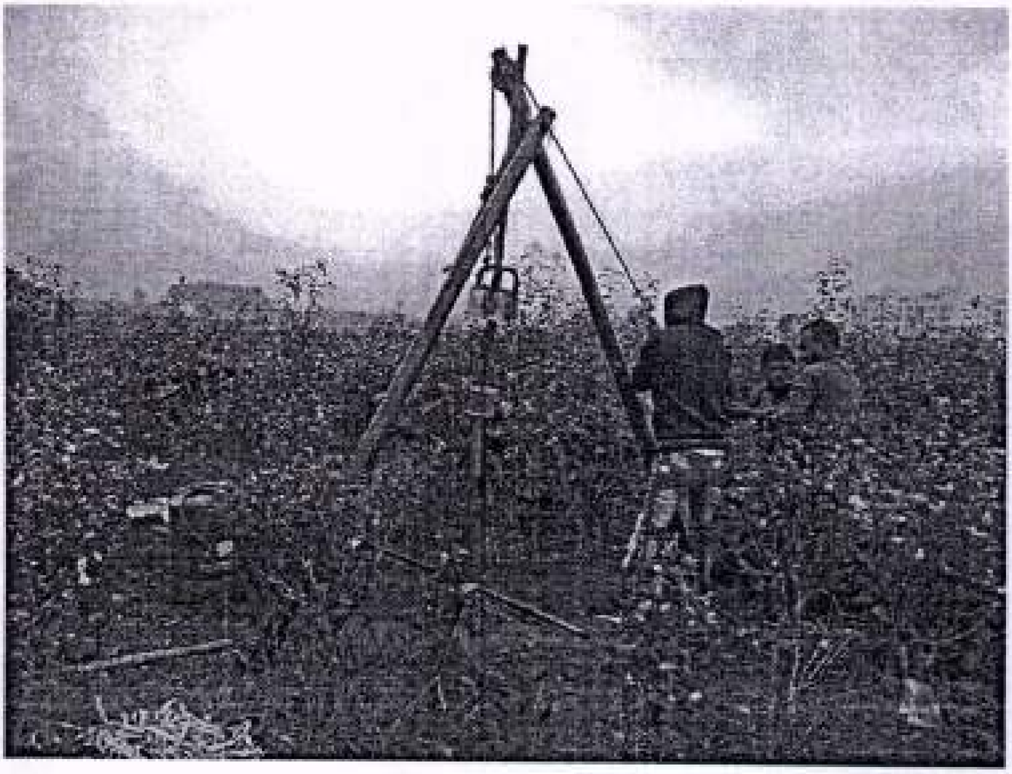
Recommendations

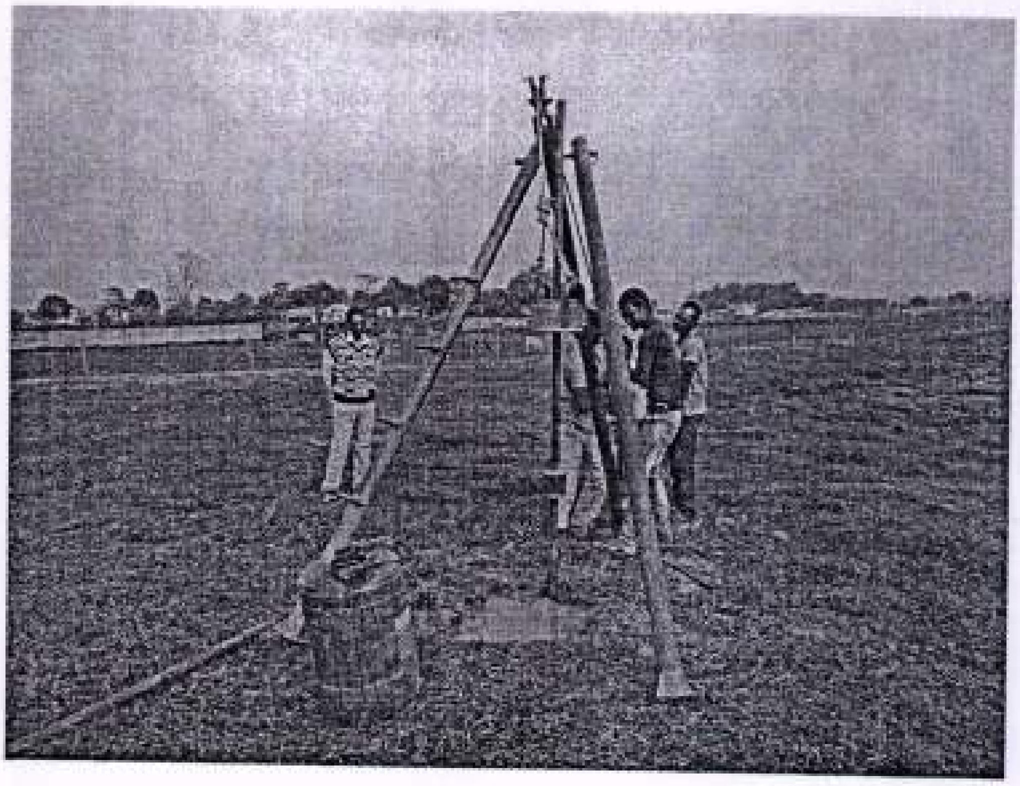
1. ***Above recommendations are made for isolated footings of mentioned sizes and depth.***
2. ***For footings of intermediate size, interpolation may be done.***
3. ***Recommendations are also valid for strip footing of equivalent width.***

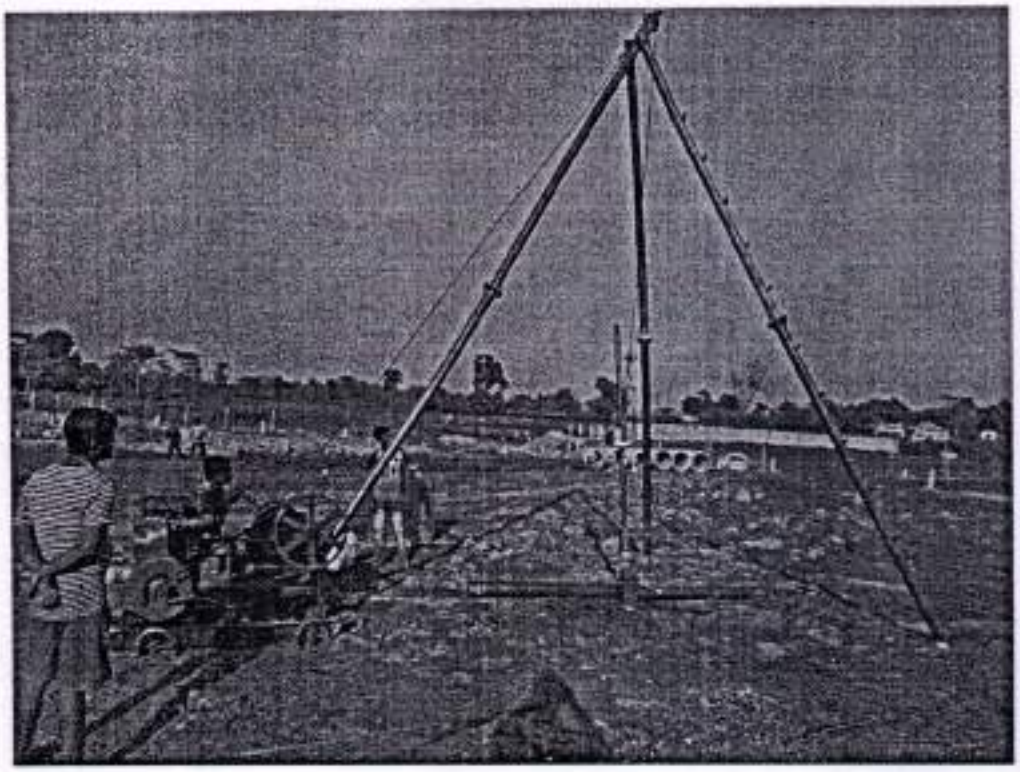
PHOTOGRAPH











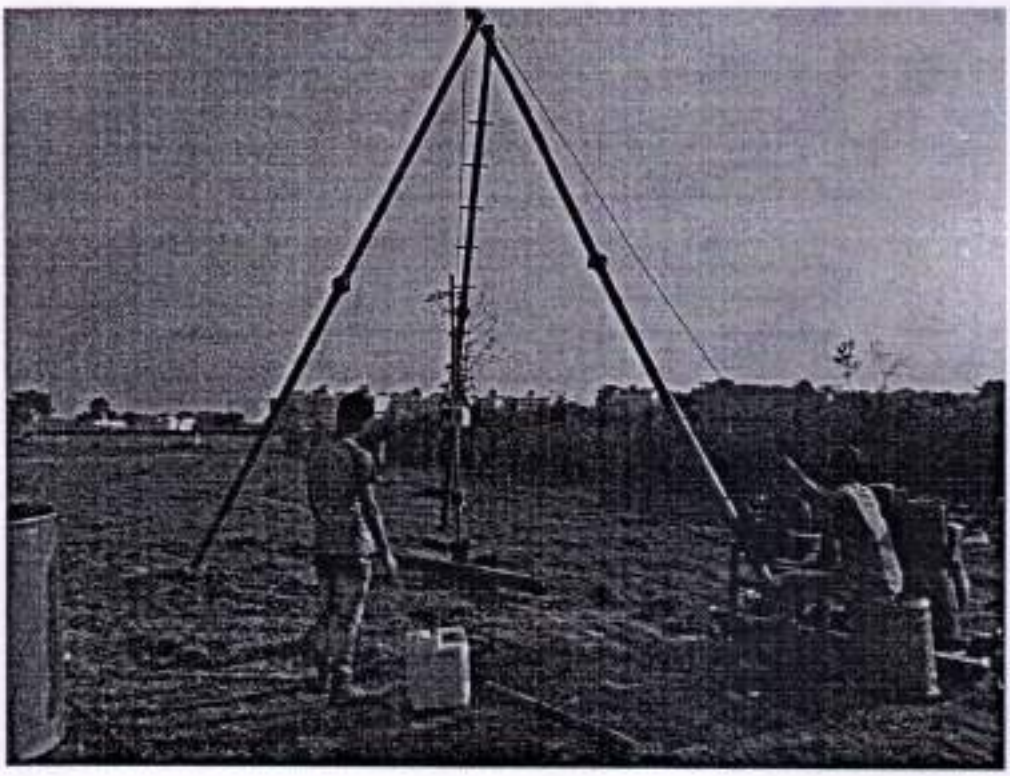


Table-19

Summary Table of calculation of Net Safe Bearing Capacities based on Shear Failure and Settlement criteria as per Codal Provisions based on which Suggested Net Safe Bearing Capacity has been recommended.

Depth	Width (B) Metre	Length (L)	Net Safe Bearing Capacity Based on General Shear Failure (t/m^2)	Net Safe Bearing Capacity Based on Local Shear Failure (t/m^2)	Void Ratio	Net Safe Bearing Capacity Based on Void Ratio (t/m^2)	Net Safe Bearing Capacity Based on Allowable Settlement (25 to 50mm) (t/m^2)	Suggested Net Safe Bearing Capacity (t/m^2)
2 Metre	2	2	37.56	11.14	0.55	37.05	19.09	**19.09**
	2	3	32.52	9.64	0.55	32.08	19.09	**19.09**
	3	3	41.66	12.06	0.55	41.09	15.90	**15.90**
	3	4	34.93	10.12	0.55	34.45	15.90	**15.90**
	4	4	46.09	13.11	0.55	45.45	14.44	**14.44**

Recommendations

1. ***Above recommendations are made for isolated footings of mentioned sizes and depth.***
2. ***For footings of intermediate size, interpolation may be done.***
3. ***Recommendations are also valid for strip footing of equivalent width.***

Checked By **Prepared By**