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GEOTECHNICAL REPORT FOR

RESIDENTIAL BUILDING " NEST EUPHORIA" AT AISHWARYA GARDEN, ARASANKAZHANI VILLAGE, TAMBARAM TALUK, CHENGALPET DISTRICT, CHENNAI

Client :

M/s. The Nest.,
Chennai

Architect :

Consultant :

Structural Consultant :

Job No. : G(C)9874 Date : 18.12.2024

NAGADI CONSULTANTS PRIVATE LIMITED

Branch :

Chennai

Project : **RESIDENTIAL BUILDING " NEST EUPHORIA" AT AISHWARYA GARDEN, ARASANKAZHANI VILLAGE, TAMBARAM TALUK, CHENGALPET DISTRICT, CHENNAI - 600126.**

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GEOTECHNICAL INVESTIGATION REPORT

for Residential Building " NEST EUPHORIA" at Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District, Chennai

EXECUTIVE SUMMARY

M/s. The Nest, Chennai are proposing to construct a Residential Building " NEST EUPHORIA" at Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District, Chennai - 600126.

The site for the proposed Residential Building is situated at Survey Nos. 133/1, 133/2A and 134/1A1D which is having southern side Road in Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District, Chennai - 600126. The site measures approximately 1.5acres in area. The site is having boundary wall on all the sides and is fairly level in topography. Vegetation in the form of grass were observed within the site during the period of field investigations. As per the information provided by the client, the site was filled up with soil of about 2m thick.

The proposed Residential building consists of a ground floor and five upper floors.

Geotechnical investigations have been undertaken at the site as per the scope of investigations stipulated by the client, which consisted of conducting 2 boreholes down to refusal/rock strata (where N-value is >100) and further drilling in refusal strata by 3m depth.

The results of borehole investigations indicate the presence of filled-up strata (Brown clayey silty sand with brickbats) down to 2.1m depth below which virgin soil was encountered. The virgin soil encountered is Brown sandy silty clay down to 8.7-8.8m depth and underlain by Brown clayey silty sand down to 10.5/11m depth below the existing ground level at which refusal/rock strata was encountered. The refusal strata is in the form of completely weathered rock (Charnockites based) down to the maximum investigated depth of 13.5/14m below existing ground level.

The soil strata is in a medium stiff/medium dense state from existing ground level down to the

depths of refusal strata encountered between 10.5/11m depth below existing ground level.

Ground water table was encountered at 1.5m depth in the boreholes during the period of field investigations. This high water table may be due to the rains that occurred prior the field investigations and may go down in due course of time.

In view of the observed subsoil conditions, the proposed building can be supported on *Bored Pile Foundations.* The piles capacities are given below for piles after embedding in refusal strata (where N-value is >100):

Diameter of Pile (mm)	Times the Diameter of Pile in Refusal Strata	Safe Pile Capacity (t)	Safe Uplift Capacity (t)
500		100	25
600	4D	150	40
750		230	60
500		130	40
600	6D	190	60
750		295	95

D-Diameter of Pile

The bentonite being used during piling should be as per IS 2911.

The bottom of the pile bore should be properly cleaned as per the procedure given in the BIS IS:2911 (Part1/Sec2), prior to carrying out the tremie concreting. This is essential to ensure that the end bearing capacity of the pile is mobilised.

REPORT ON GEOTECHNICAL INVESTIGATION FOR RESIDENTIAL BUILDING " NEST EUPHORIA" AT AISHWARYA GARDEN, ARASANKAZHANI VILLAGE, TAMBARAM TALUK, CHENGALPET DISTRICT, CHENNAI

1.0 INTRODUCTION

1.1 Overview

1.1.1 M/s. The Nest, Chennai are proposing to construct a Residential Building " NEST EUPHORIA" at Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District, Chennai - 600126.

1.1.2 The geotechnical investigations have been carried to ascertain the soil conditions for the design of foundations of the proposed Residential building.

1.2 Authority

A detailed geotechnical investigations programme has been conducted as per the authorisation by M/s. The Nest., Chennai vide their mail confirmation dated 23.11.2023.

2.0 PROJECT DETAILS

2.1 Site Location

The site for the proposed Residential Building is situated at Survey Nos. 133/1, 133/2A and 134/1A1D which is having southern side Road in Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District, Chennai - 600126.

2.2 Site Layout and Topography

2.2.1 The site measures approximately 1.5acres in area. The site is having boundary wall on all the sides and is fairly level in topography. Vegetation in the form of grass were observed within the site during the period of field investigations. As per the information provided by the client, the site was filled up with soil of about 2m thick.

2.2.2 The colour of the exposed soil surface is Brown.

2.3 The Structure

As per information provided by the client, the proposed Residential building consists of a ground floor and five upper floors.

2.4 Seismic Zone

Site for the proposed Residential building is situated in Arasankazhani Village, Chennai which falls under Seismic Zone III as per IS 1893 (Part 1) - 2016.

2.5 Geographical Information

2.5.1 Site for the proposed Residential building is situated at:

a) Latitude : 12°52'

b) Longitude : 80°11'

3.0 OBJECT OF INVESTIGATIONS

3.1 For designing the foundation system of the proposed residential building, the following data are required:

a) Type of foundation system.

b) Depth below the ground level at which the foundation system is to be laid.

c) Allowable bearing pressure on the foundations levels.

3.2 To determine above factors, the following information would be required:

a) The subsoil profile indicating thicknesses of the various soil strata, to a depth down to the influence zone below the foundations.

b) Engineering properties of the soil strata at various levels.

c) Physical characteristics of the soil strata.

d) Variation of the strength of the strata with depth.

3.3 For evaluating the above parameters, field investigations and laboratory investigations

on the soil samples collected during the field investigations, have been carried out.

3.4 The results from these investigations have been analysed to provide the recommendations for the design of foundations.

4.0 SCOPE OF INVESTIGATIONS

4.1 Scope of investigations as given in the work order consisted of :

a) Conducting 2 boreholes down to refusal/rock strata (where N-value is >100) and further drilling in refusal strata by 3m, as required by the client.

b) Conducting standard penetration tests at 1.5m intervals.

c) Recovering undisturbed soil samples from various levels of the subsoil strata.

d) Recording ground water table levels, if met with.

e) Conducting relevant laboratory tests on soil samples recovered.

f) Preparation and submission of a technical report containing the details of the tests carried out, their analysis and recommendations regarding the foundation system to be adopted. Two copies of the report are to be submitted.

5.0 FIELD INVESTIGATIONS

5.1 General Details

5.1.1 The location of the borehole was shown at site by the client's representative. A Schematic site plan showing the borehole location marked by the client is given in fig.1.

5.1.2 Weather was clear during the period of field investigations which were carried out in the last week of November 2023.

5.2 Boreholes

5.2.1 The boreholes were progressed by mechanically operated rotary core drill method.

5.2.2 The boreholes were terminated after drilling a minimum of 3m in refusal strata (where N-value is >100). The refusal strata in the form of completely weathered rock

(Charnockite Based) was encountered at 10.5/11m depth and continued down to the termination depth of 13.5/14m depth below existing ground level. The drilling in refusal/rock strata was conducted using NX size core barrel fitted with diamond bits. The boreholes were terminated as per the stipulated scope of work.

5.2.3 The depth of ground water table encountered, depth of refusal strata encountered during the investigations and termination depths of the boreholes are given in the following table.

Borehole No.	Depth of Ground Water Table Below EGL (m)	Depth of Refusal/Rock Strata Below EGL (m)	Termination Depth Below EGL (m)
1	1.5	10.5	13.5
2	1.5	11	14

5.2.4 Ground water table was encountered at 1.5m depth in the boreholes during the period of field investigations. This high water table may be due to the rains that occurred prior the field investigations and may go down in due course of time.

5.2.5 Standard Penetration Tests were conducted in soil strata at 1.5m depth intervals.

5.2.6 Disturbed soil samples recovered from split spoon sampler were packed in polythene bags, labelled and retained for identification purposes.

5.2.7 Undisturbed soil sample was recovered by thin walled tube conforming to IS 2132. The tube had an area ratio of less than 10%. The diameter of soil sample was 50mm and length was 45cm.

6.0 LABORATORY INVESTIGATIONS

6.1 The soil samples brought to the laboratory were subjected to various tests to determine the following properties

a) Type of soil and its gradation

b) Consistency limits

c) Natural density

d) Natural water content

e) Shear strength properties

6.2 In order to determine the above properties listed in 6.1, the following tests were conducted.

a) Sieve analysis on the coarse grained soil fraction

b) Hydrometer analysis on the fine grained soil fraction

c) Liquid and plastic limits

d) Natural Density and Water Content tests

e) Triaxial compression tests

f) Free Swell Index tests

7.0 RESULTS AND ANALYSIS

7.1 Presentation of Results

7.1.1 The results of borehole investigations and of the laboratory investigations conducted on the soil samples collected from the borehole have been presented in the form of soil profile table in Table Nos. 1 and 2.

7.1.2 The soil profile table indicates the following:

a) Standard Penetration Test Values (i.e. N- values observed) at various depths

b) Soil description identifying the type of soil

c) Grain size analysis indicating composition of subsoil

d) Consistency limits

e) In-situ bulk density and Water content

f) Triaxial compression test results

7.2 Analysis of Soil Profile

7.2.1 A perusal of the data presented in the soil profile table indicates the presence of the following substrata.

a) Stratum - I : Filled up (Soil with brickbats)

b) Stratum - II : Brown sandy silty clay

c) Stratum - III : Brown clayey silty sand

d) Stratum - IV : Refusal strata - Brown completely weathered rock (Charnockite Based)

7.2.2 The thicknesses in the borehole of each strata described in 7.2.1 is given in the table below:

BH No.	Depth (m) : from - to			
	Stratum - I	Stratum - II	Stratum - III	Stratum - IV
1	0.0 - 2.1	2.1 - 8.7	8.7 - 10.5	10.5 - 13.5
2	0.0 - 2.1	2.1 - 8.8	8.8 - 11	11 - 14

7.2.3 The above results show that :

a) Stratum - I consisting of Filled-up strata (soil with brickbats) strata has been encountered down to the depth of 2.1m below existing ground level.

b) Stratum - II consisting of Brown sandy silty clay having significant percentages of clay and varying percentages of sand and silt, has been encountered from 2.1 down to 8.7-8.8m depth below existing ground level.

c) Stratum - III consisting of Brown clayey silty sand having significant percentages of sand and varying percentages of silt and clay, has been encountered from 8.7-8.8 down to 10.5-11m depth below existing ground level.

d) Stratum - IV consisting of Refusal strata - Brown completely weathered rock -

Charnockites based was encountered from 10.5-11m to the termination depths of 13.5/14m depth below existing ground level.

7.3 Soil Composition

7.3.1 The grain size distribution of the soil samples at various depths, as determined in the laboratory have been presented in the form of grain size analysis curves in figs. 3a and 3b.

7.3.2 The variations in the grain size distribution - strata wise across the borehole are as follows:

a) Stratum - II : Brown sandy silty clay

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
1	0	13 - 25	36 - 38	39 - 51
2	0	14 - 30	34 - 40	36 - 47

b) Stratum - III : Brown clayey silty sand

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
1	0	63	19	18
2	0	67	19	15

7.3.3 The above results indicate that the soil in :

a) Stratum - II consists of about 13-30% of sand, 34-40% of silt and 36-51% of clay.

b) Stratum - III consists of about 15-18% of clay, 19% of silt and 63-67% of sand.

7.4 In-situ Density and Water Content

7.4.1 The bulk/in-situ bulk density, water content and dry density obtained from undisturbed soil sample are tabulated below.

BH No.	Depth (m)	In-situ Bulk Density (g/cm^3)	Water Content (%)	Dry Density (g/cm^3)
1	4	1.86	26.9	1.47
	5.5	1.89	25.1	1.51
	7	1.96	25	1.57
	8.5	1.99	22.6	1.62
2	3	1.86	26.2	1.47
	4.5	1.89	23.9	1.53
	6	1.95	23.7	1.58
	7.5	2.01	23.0	1.63

7.4.2 The above results indicate that the subsoil is in a medium stiff/ medium dense state down to the depths of refusal strata encountered between 10.5/11m depth below existing ground level.

7.5 Consistency Limits

7.6 The Consistency Limits determined for the soil in Stratum - II (Brown sandy silty clay) indicates that the liquid limit varies between 47% to 62%, plastic limit varies between 18% to 23% plasticity index varies between 29% to 39%.

7.6.1 The Consistency Limits determined for the soil in Stratum - III (Brown clayey silty sand) indicates that the liquid limit varies between 22% to 27%, plastic limit varies between 14% to 15% plasticity index varies between 8% to 12%.

7.6.2 The Consistency Limits indicate that the soil in :

a) Stratum - I (Brown sandy silty clay) is high plastic in nature.

b) Stratum - II (Brown clayey silty sand) is low plastic in nature.

7.7 Standard Penetration Tests

7.7.1 Standard Penetration Test values (N-values observed) are presented in the soil profile

table nos.1 and 2.

7.7.2 Standard Penetration Test values (N-values observed) have also been presented in form of plots of N-values vs depth in fig.4.

7.7.3 The N-values indicate that the soil strata encountered down to the depths of refusal strata is in a medium stiff/ medium dense state with observed N-values ranging between 5 and 41.

7.8 Triaxial Test Results

The cohesion 'c' obtained from consolidated drained triaxial compression test varies between 0.27kg/cm² to 0.32kg/cm² and the angle of shearing resistance 'ϕ' of the soil varies between 14° and 18°.

7.9 Free Swell Index

7.9.1 The free swell index of the soil samples collected at various depths are given below:

BH No.	Free Swell Index (%) at Depth (m)			
	2.5	3	4	4.5
1	-	52.8	-	55.2
2	56.7	-	52.9	-

7.9.2 The above results indicate that the top soil strata is medium swelling in nature. Hence, the excavated soil cannot be used for backfilling purposes.

7.10 Compiled Soil Profile

7.10.1 An overview of the results and their analysis has been presented in the form of a compiled soil (fig. 2).

7.10.2 The above figure shows the various strata encountered and their thicknesses in the borehole and also gives the soil composition and the observed N-values at various depths along with the depth at which undisturbed soil sample was collected.

8.0 DESIGN CRITERIA

8.1 Design Parameters

8.1.1 The parameters required for the design of foundation system for the proposed residential building are:

a) Type of foundation to be adopted

b) Depth at which the foundations have to be laid/depth of piles

c) Allowable bearing pressure on the soil at the foundation level/safe capacity of piles

8.1.2 On the basis of the analysis of the results of investigations, the required design parameters have been arrived at and are given in the following sections.

8.2 Type of Foundations

8.2.1 The type of foundation depends on the following:

a) Subsoil conditions

b) Type of structure

c) Configuration at loading points

8.2.2 As per information provided by the client, the proposed Residential building consists of a ground floor and five upper floors.

8.2.3 The results of the investigations are shown that the subsoil encountered is in a medium stiff/ medium dense state from existing ground level down to the depths of refusal strata encountered between 10.5/11m depth below existing ground level.

8.2.4 In view of the above, the proposed building can be supported on Shallow Foundations-Isolated/Strip Footings. Due to the high water table encountered during the field investigations, the clients have requested for pile foundations. Hence, the proposed building can be supported on *Bored Pile Foundations*.

8.3 Depth of Pile Foundation

8.3.1 To ensure similarity of settlement of all the pile foundations for the proposed structure, the pile foundations should be founded in the refusal/rock strata.

8.3.2 As the pile foundations will be founded in refusal/rock strata, to achieve economy as well as maximum efficacy, the pile foundations should preferably be loaded to the safe structural capacity.

8.3.3 To ensure the mobilization of the full safe structural capacity, the Bored Piles should be embedded or socketed in refusal/completely weathered rock strata to a minimum depth equivalent to 6 times the diameter of the pile. However, the pile foundations can be laid after embedding in refusal strata by a minimum of 4 times the diameter of pile.

8.4 Safe Pile Capacity

8.4.1 The safe pile capacities of various diameter of piles are given below:

Diameter of Pile (mm)	Times the Diameter of Pile in Refusal Strata	Safe Pile Capacity (t)	Safe Uplift Capacity (t)
500	4D	100	25
600		150	40
750		230	60
500	6D	130	40
600		190	60
750		295	95

D-Diameter of Pile

9.0 RECOMMENDATIONS

9.1 Type of Foundations

Bored Pile Foundations

9.2 Safe Pile Capacity

Diameter of Pile (mm)	*Times the Diameter of Pile in Refusal Strata*	*Safe Pile Capacity (t)*	*Safe Uplift Capacity (t)*
500		*100*	*25*
600	*4D*	*150*	*40*
750		*230*	*60*
500		*130*	*40*
600	*6D*	*190*	*60*
750		*295*	*95*

D-Diameter of Pile

9.3 Construction Advisories

9.3.1 The soil of each strata has been described with name, colour etc. During excavation, any variations observed in the nature and condition of the soil from those given in this Report should be noted and appropriate action should be taken.

9.3.2 The bentonite slurry to be used for stabilising the pile bore during piling should conform to the requirements as given in BIS code IS:2911 (Part1/Sec2).

9.3.3 The bottom of the pile bore should be properly cleaned as per the procedure given in the BIS IS:2911 (Part1/Sec2), prior to carrying out the tremie concreting. This is essential to ensure that the end bearing capacity of the pile is mobilised.

9.4 Appendices

9.4.1 The calculations for the allowable bearing pressure have been provided in Appendix-A of this report.

9.4.2 The List of IS codes referred for providing the recommendations and that which might be required to implement the same have been given in Appendix-B of this report.

9.5 Notes

9.5.1 The recommendations given in this report have been arrived at on the basis of design parameters which have been judiciously adopted by giving due consideration to the results of field and laboratory investigations as well as NAGADI's experience of over four decades in working in various types of soil and rock conditions all over India.

9.5.2 The entire report should be studied before adopting the recommendations given in the report.

10.0 LIMITATIONS

This Geotechnical investigation has been carried out at locations in the site chosen by the client as representing the entire site. The recommendations provided in this Report are hence valid only for those test locations. However, if there is any change in the subsoil conditions and properties at places between or beyond the chosen test locations, Nagadi may be contacted for further actions. Fresh investigations will have to be carried out at such locations.

Dr. N. Santosh Rao
Technical Director
*For **NAGADI CONSULTANTS PVT. LTD.***

CALCULATION FOR CAPACITY OF PILE

Typical calculations for the pile capacity has been given hereunder for a pile of diameter 500mm. For piles of other diameters, a similar procedure has been used to arrive at the recommended pile capacities.

A.1 Pile Capacity

A.1.1 As per IS 2911 (Part 1/sec 2):2010, the safe pile capacity or the allowable load on the pile is calculated using the formula given below:

$$Q_a = C_{u1}N_c.\pi B^2/4F_s + \alpha c_{u2}.\pi BL/F_s$$

Where,

Q_a = The allowable load on the pile in kN

C_{u1} = shear strength of rock below the base of the pile, in kN/m² = 800kN/m²

N_c = bearing capacity factor taken as 9;

F_s = factor of safety usually taken as 3;

α = 0.9 (recommended value);

c_{u2} = average shear strength of rock in the socketed length of pile, in kN/m² = 600kN/m²

B = minimum width of pile shaft (diameter in case of circular piles), in m = 0.5m

L = socket length of pile, in m = 6times x 0.5 = 3m.

A.1.2 Substituting the values in the above equation we get,

Q_a = 47.12t + 84.82t

= 131.9t

A.1.3 Therefore adopt ***Safe Pile Capacity = 130t***

A.2 UPLIFT CAPACITY

A.2.1 The safe uplift capacity is calculated based on the safe skin friction capacity of the pile in uplift using the formula given below:

$$Q_{au} = \alpha c_{u2}.\pi BL/F_s$$

Where,

Q_{au} = The allowable load on the pile in kN

α = 0.9 (recommended value);

c_{u2} = average shear strength of rock in the socketed length of pile, in kN/m² = 600kN/m²

B = minimum width of pile shaft (diameter in case of circular piles), in m = 0.5m

L = socket length of pile, in m = 6times x 0.5 = 3m.

F_s = factor of safety usually taken as 6

A.2.2 Substituting the values in the above equation, we get Q_{au} = 42.4t.

A.2.3 Therefore adopt ***Safe Uplift Capacity = 40t***

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LIST OF IS CODES

Field Investigation

1. IS : 1498 - 1970 : Classification and identification of soils for general engineering purposes (First Revision) (Amendment 2)
2. IS : 1892 - 1979 : Code of practice for sub surface investigations for foundations (First revision)
3. IS : 2131 - 1981 : Method of Standard Penetration Tests for soils (First revision)
4. IS : 2132 - 1986 : Code of practice for thin walled tube sampling of soils (Second revision)

Laboratory Tests

1. IS : 2720 - 1983 (Part 1) : Methods of test for soils: Preparation of dry soil samples for various tests (Second revision)
2. IS : 2720 - 1980 (Part 2) : Method of test for soils: Determination of water content (Second revision) Amendment 1
3. IS : 2720 - 1980 (Part 3/Sec 1) : Method of test for soils : Determination of Specific Gravity : Fine grained soils. (First revision)
4. IS : 2720 - 1980 (Part 3/Sec 2) : Method of test for soils : Determination of Specific Gravity : Fine, Medium & Coarse grained soils. (First revision).
5. IS : 2720 - 1985 (Part 4) : Method of test for soils : Grain size analysis (Second revision)
6. IS : 2720 - 1985 (Part 5) : Method of test for soils : Determination of liquid and plastic limit (Second revision)
7. IS : 2720 - 1977 (Part 40) : Methods of tests for soils: Determination of free swell index of soils.

Foundation Construction

1. IS : 1080 - 1986 : Code of practice for design and construction of shallow foundations on soils (other than raft, ring and shell) (Second revision)
2. IS : 1904 - 1986 : Code of practice for design and construction of foundation in soils: General requirements (Third revision)
3. IS 6403 - 1981 : Code of practice for determination of bearing capacity of shallow foundations : First revision (Amendment 1)
4. IS 8009 - 1976 (Part 1) : Code of practice for calculation of settlements of foundations : Shallow foundations subject to symmetrical static vertical loads (Amendment 2)

TABLES



SOIL PROFILE

Project: Residential Building at Aishwarya Garden, Arasankazhani Village, Tambaram Tk, Chengalpet Dist, Chennai - 600126.

B. H. Location: | Water Table: 1.50m | Term. Depth : 13.5m | B.H. No. : 1

N - Value#	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density * (g/cm^3)	Water Cont (%)	Type	c (kg/cm^2)	Φ (°)
	0.0	Ground level											
	2.0	Filled up (Brown clayey silty sand with brickbats)											
	2.10	Brown sandy silty clay											
5	3.0	Brown sandy silty clay	0	16	38	46	57	23					
	4.0	Brown sandy silty clay							1.86	26.9	Soft sample		
6	4.5	Brown sandy silty clay	0	15	38	47	59	23					
	5.5	Brown sandy silty clay							1.89	25.1	Soft sample		
9	6.0	Brown sandy silty clay	0	13	36	51	62	25					
	7.0	Brown sandy silty clay							1.96	25.0	CD	0.32	14
12	7.5	Brown sandy silty clay	0	25	36	39	48	20					
	8.5	Brown sandy silty clay							1.99	22.6	CD	0.27	18
	8.8	Change of strata											
29	9.0	Brown clayey silty sand	0	63	19	18	27	15					
	10.5	Change of strata											
>100 (77/20cm)		Brown weathered rock (Charnockites based)											
>100 (35/Nil)	12.0	Brown weathered rock (Charnockites based)											
>100 (30/Nil)	13.0	Brown weathered rock (Charnockites based)											

*-Natural Bulk Density # -N Values (Observed)

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Job No. G(C)9874

Sheet No. : 1

SOIL PROFILE

Project: Residential Building at Aishwarya Garden, Arasankazhani Village, Tambaram Tk, Chengalpet Dist, Chennai - 600126.

B. H. Location: | Water Table: 1.50m | Term. Depth : 14.0m | B.H. No. : 2

N - Value#	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density * (g/cm^3)	Water Cont (%)	Type	c (kg/cm^2)	Φ (°)
	0.0	Ground level											
	2.0	Filled up (Brown clayey silty sand with brickbats)											
	2.10	Brown sandy silty clay											
6	2.5	Brown sandy silty clay	0	14	38	47	59	23					
	3.0	Brown sandy silty clay							1.86	26.2	Soft sample		
7	4.0	Brown sandy silty clay	0	17	40	43	50	21					
	4.5	Brown sandy silty clay							1.89	23.9	Soft sample		
11	5.5	Brown sandy silty clay	0	20	39	41	50	20					
	6.0	Brown sandy silty clay							1.95	23.7	CD	0.30	17
14	7.0	Brown sandy silty clay	0	18	37	45	57	22					
	7.5	Brown sandy silty clay							2.01	23.0	CD	0.32	17
25	8.5	Brown sandy silty clay	0	30	34	36	47	18					
	8.7	Change of strata											
41	10.0	Brown clayey silty sand	0	67	19	15	22	14					
	11.0	Change of strata											
>100 (50/7cm)		Brown weathered rock (Charnockites based)											
>100 (30/Nil)	12.5	Brown weathered rock (Charnockites based)											
>100 (30/Nil)	14.0	Brown weathered rock (Charnockites based)											

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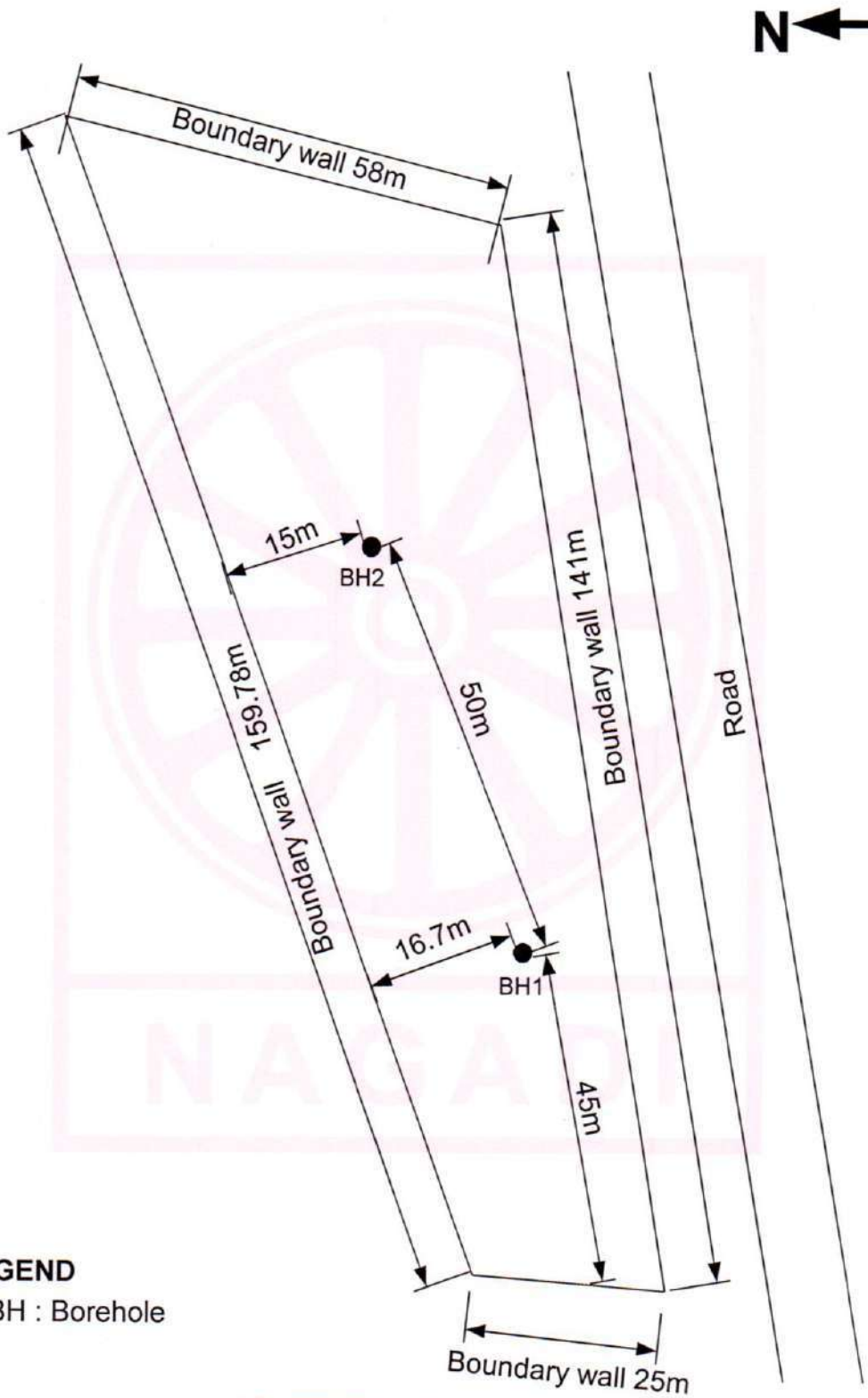
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Job No. G(C)9874

Sheet No. : 2

FIGURES





LEGEND

● BH : Borehole

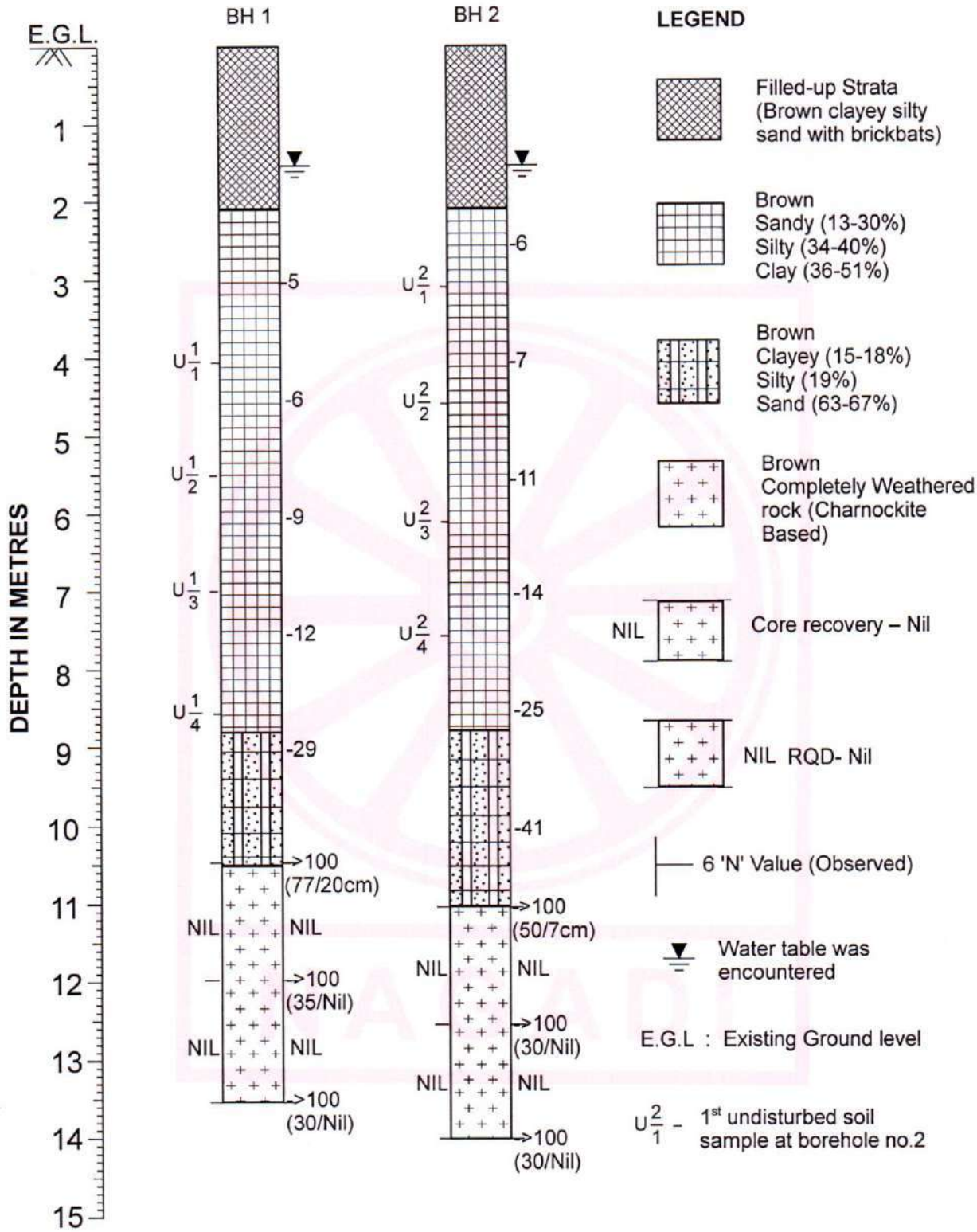
SCHEMATIC SITE PLAN
(NOT TO SCALE)

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Sheet No. : 1



COMPILED SOIL PROFILE

PROJECT : Residential Building at Aishwarya Garden, Arasankazhani Village, Tambaram Taluk, Chengalpet District

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Sheet No. : 2

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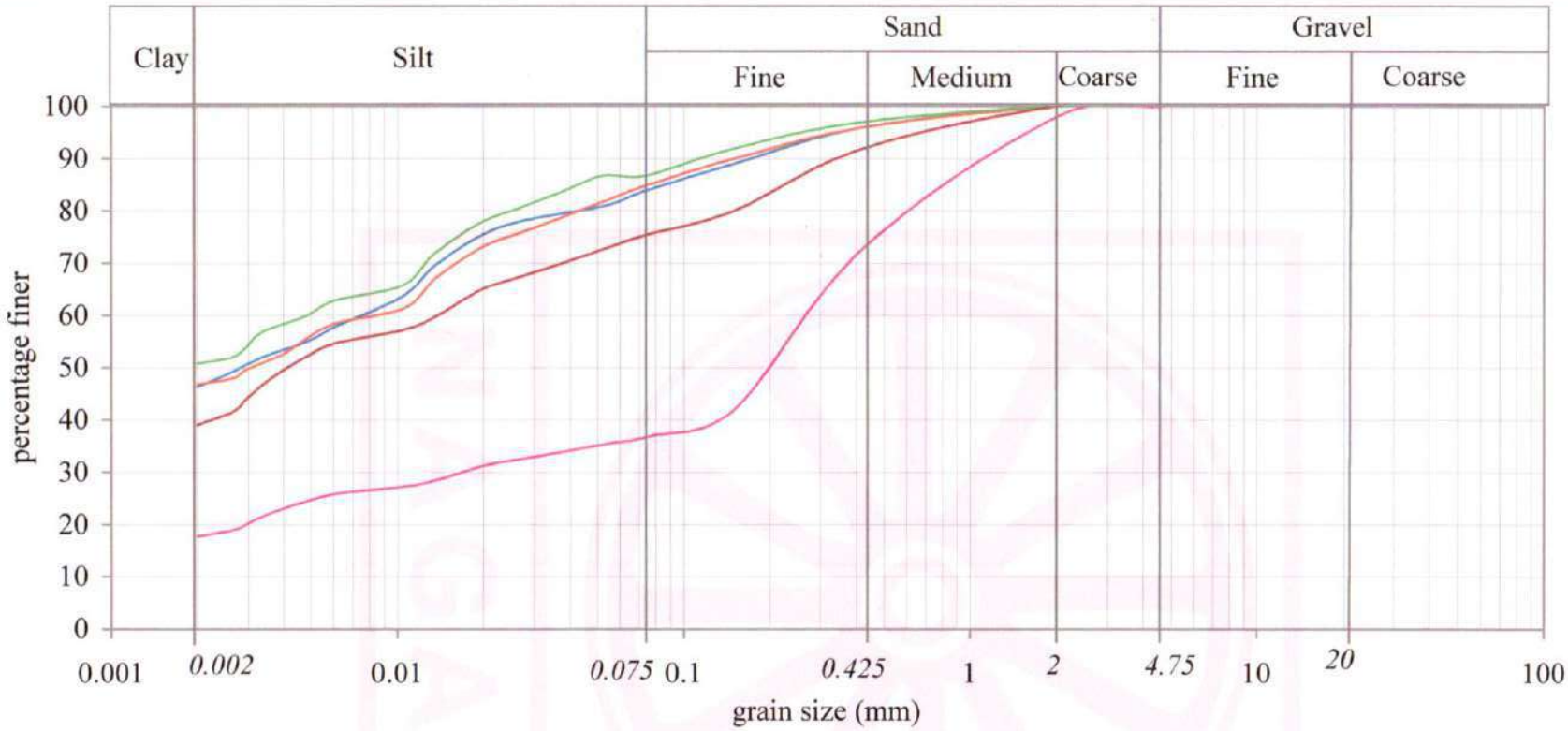
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Job No. : G(C)9874

Sheet No. : 3a



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	1	3.0	Sandy silty clay	0	16	38	46	0.008		
	1	4.5	Sandy silty clay	0	15	38	47	0.009		
	1	6.0	Sandy silty clay	0	13	36	51	0.005		
	1	7.5	Sandy silty clay	0	25	36	39	0.015		
	1	9.0	Clayey silty sand	0	63	19	18	0.280		

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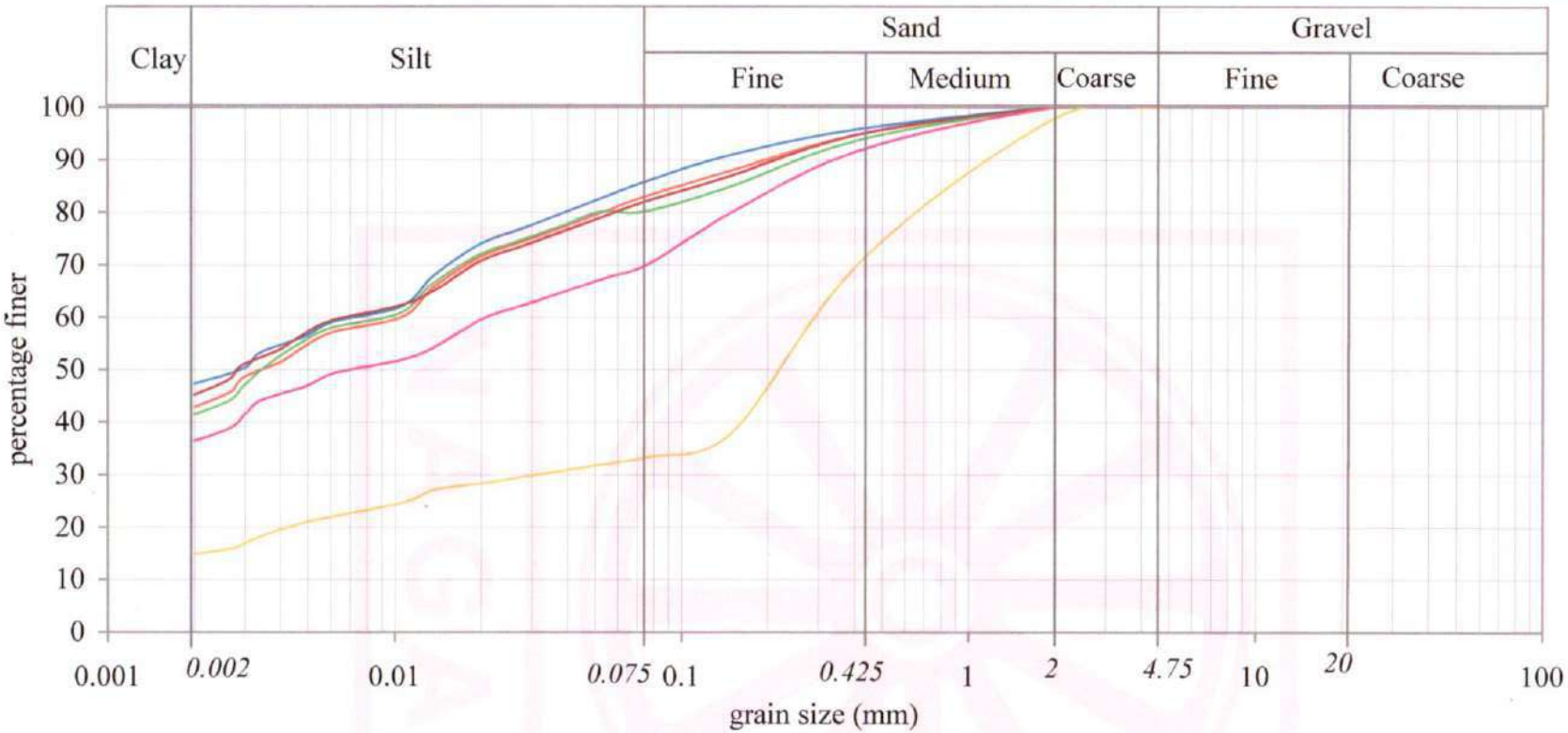
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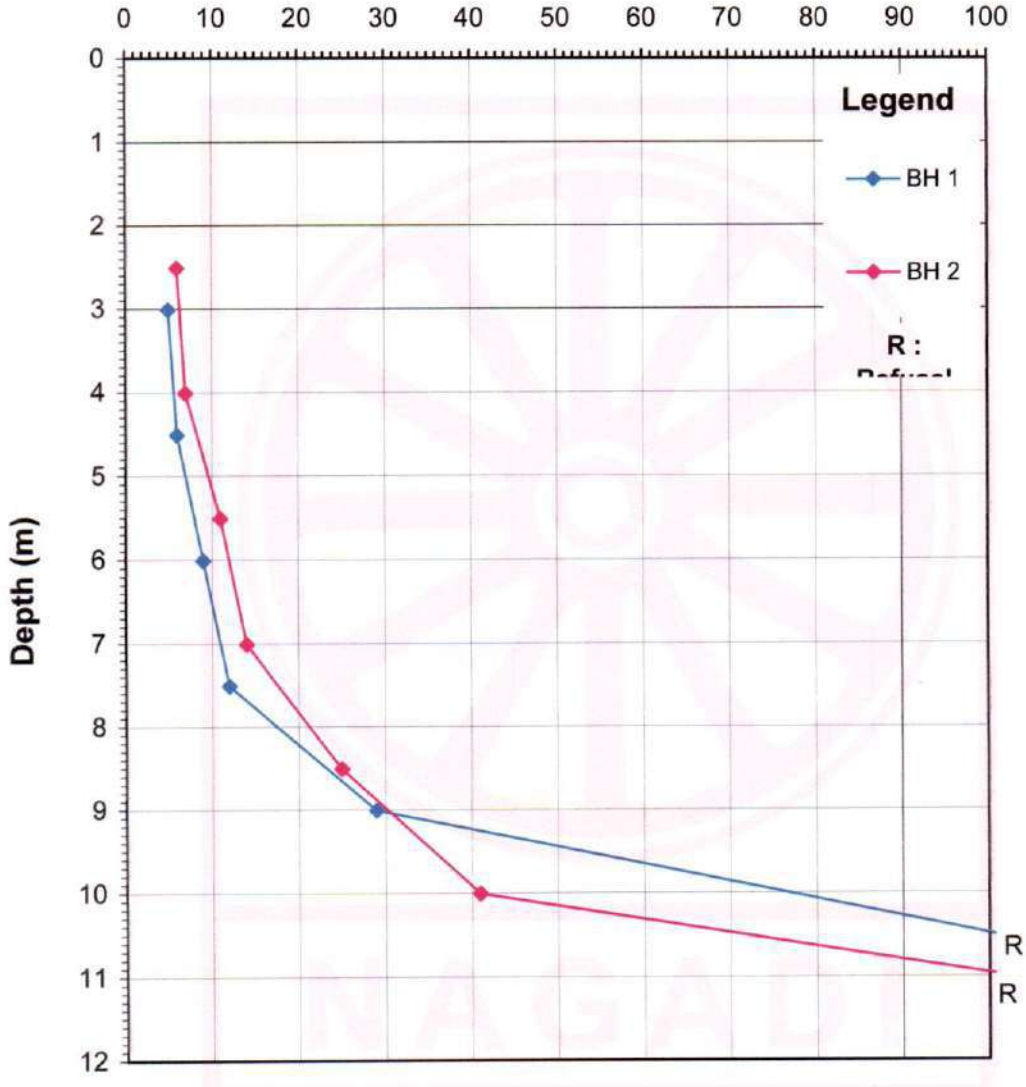
Job No. : G(C)9874

Sheet No. : 3b



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	2	2.5	Sandy silty clay	0	14	38	47	0.007		
	2	4.0	Sandy silty clay	0	17	40	43	0.010		
	2	5.5	Sandy silty clay	0	20	39	41	0.010		
	2	7.0	Sandy silty clay	0	18	37	45	0.007		
	2	8.5	Sandy silty clay	0	30	34	36	0.020		
	2	10.0	Clayey silty sand	0	67	19	15	0.300		

SPT Values (Observed)



SPT Values (Observed) Vs Depth Curves

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