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Chief Consultant & Chairman : Dr. V.V.S. Rao

Chennai, 13th August 2024

M/s. Infinium Shelters LLP.,
No:1733/1, 2nd Floor, Opp all india Radio,
Trichy Road, Ramanathapuram
Coimbatore - 641 045.

Dear Sirs,

Sub: Soil Investigation for proposed residential building in (old S.F.No:340/2C & 348/1pt), New T.S.No.1/4, 1/5, 1/6 & 1/7,Block No.17, Ward No. Y (25), with a Site Area of 6070.00sq.m at Vilankurichi Village, Coimbatore North Taluk, Coimbatore.

Please find herewith enclosed our **soft copy of our Report No.G(C)9813 dated 2nd May 2023** duly signed for the investigations conducted by us.

Thanking you,

Yours faithfully,

for *NAGADI CONSULTANTS PVT. LTD.,*
Encl: as above
#

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Member of :
Association of Professional Firms Practicising Geotechnicques (ASFE); Association 01 Consulting Civil Engineers (ACCE); Association of Consulting Engineer (ACE) (India); Builders Association of India (BAI); Bureau of Indian Standards, BDC 43 & BDC 23 (BIS); Consultancy Department Center (CDC); Geotechnical Engineering International Resources Center (GEIRC) (Bangkok); Indian Concrete Institute (ICI); Indian Geotechnical Society (IGS); Indian Group of Geotextiles (IGG); Indian Institute of Public Administration (IIPA); Indian Institution of Plant Engineers (IIPE); Indian Roads Congress (IRC); Indian Society for Rock Mechanics & Tunneling Technology (ISRMTT); Indian Society of Earthquake Technology (ISET); Institute of Standards Engineers, (ISE); Institution of Engineers (India) (IE); Institution of Mechanical Engineers (IME); International Federation of Consulting

GEOTECHNICAL INVESTIGATION REPORT

for Residential Building at Vilankurichi Village, Coimbatore

EXECUTIVE SUMMARY

M/s. Infinium Shelters LLP., Coimbatore are proposing to construct a Residential Building at Vilankurichi Village, Coimbatore.

The site for the proposed Residential Building is situated at Ward No. Y(25), AA(27), Block No:17, TS No.1/4,1/5,1/6 & 1/7on the northern side of road in Vilankurichi Village, Coimbatore. The site measures approximately 97.57m x 61.12m. The site is having boundary wall on two sides and fenced on northern and southern sides. The site is fairly level in topography and in level with the adjacent road. Vegetation in the form of trees were grown within the site during the period of field investigations.

The proposed Residential building consists of a single basement, 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 6 boreholes down to 10m depth irrespective of strata encountered.

The results of borehole investigations indicate the presence of Brown sandy silty clay/Brown with white clayey silty sand with gravel/Brown silty sand with gravel down to the depths of refusal strata encountered between 2.8m-3.7m depth. The refusal strata is in the form of completely weathered rock (Charnockites based) and continued down to the maximum investigated depth of 10m below existing ground level.

The soil strata encountered down to the depths of refusal strata is in a medium stiff/medium dense state.

Ground water table was not encountered in the boreholes down to the maximum investigated depth of 10m below existing ground level during the period of field investigations.

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In view of the observed subsoil conditions, the proposed residential building can be supported on *Isolated/Strip Footings laid at a minimum depth of 4m below the existing ground level with a Net allowable bearing pressure of 30t/m^2 (3.0kg/cm^2) for widths of foundations ≥1.5m.*

The excavated clayey soil (sandy silty clay) cannot be used for backfilling purposes as the clayey soil is of medium swelling type.

After the excavation for foundations, if loose pieces/pockets of weathered rock are encountered, the same shall be removed and backfilled with concrete. A levelling course of concrete shall be laid and the construction of foundations can be taken up subsequently.

Stiff Tie-beams connecting the columns in both directions may be provided which will render additional rigidity to the structure.

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REPORT ON GEOTECHNICAL INVESTIGATION FOR

RESIDENTIAL BUILDING AT VILANKURICHI VILLAGE, COIMBATORE

1.0 INTRODUCTION

1.1 Overview

1.1.1 M/s. Infinium Shelters LLP., Coimbatore are proposing to construct a Residential Building at Vilankurichi Village, Coimbatore.

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. Infinium Shelters LLP., Coimbatore vide their Work Order No.IS/WO/23-24/APR/131 dated 13.04.2023.

2.0 PROJECT DETAILS

2.1 Site Location

The site for the proposed Residential Building is situated at Ward No. Y(25), AA(27), Block No:17, TS No.1/4,1/5,1/6 & 1/7on the northern side of road in Vilankurichi Village, Coimbatore.

2.2 Site Layout and Topography

2.2.1 The site measures approximately 97.57m x 61.12m. The site is having boundary wall on two sides and fenced on northern and southern sides. The site is fairly level in topography and in level with the adjacent road. Vegetation in the form of trees were grown within the site during the period of field investigations.

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 single basement, ground floor and five upper floors.

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2.4 Seismic Zone

Site for the proposed residential building is situated near Vilankurichi Village, Coimbatore 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 located at:

a) Latitude : 11˚02'

b) Longitude : 77˚00'

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:

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a) Conducting 6 boreholes down to 10m depth irrespective of strata, as required by the client.

b) Conducting standard penetration tests at 1.5m depth 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 locations of the boreholes were shown at site by the client's representative. A Schematic site plan showing the boreholes locations 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 fourth week of April 2023.

5.2 Boreholes

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

5.2.2 Refusal strata (i.e. N-value > 100) was encountered between 2.8 and 3.7m depth below the existing ground level in the form of completely weathered rock (Charnockites based). The drilling in refusal/rock strata was conducted using NX size core barrel fitted with diamond bits.

5.2.3 The boreholes were terminated at specified depth of 10m below the existing ground level as stipulated by the client.

5.2.4 The depths at which refusal/rock strata was encountered and the termination depths of

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the boreholes are given in the following table.

Borehole No.	Depth of Refusal/ Rock Strata Below EGL (m)	Termination Depth Below EGL (m)
1	3	10
2	3.3	10
3	2.8	10
4	3.4	10
5	2.8	10
6	3.7	10

5.2.5 Ground water table was not encountered in the boreholes down to the maximum termination depth of 10m below existing ground level during the period of field investigations.

5.2.6 Standard Penetration Tests were conducted in soil strata at 1/1.5m depth intervals.

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

5.2.8 Undisturbed soil samples were recovered by thin walled tubes conforming to IS 2132. These tubes had an area ratio of less than 10%. The diameter of soil samples were 50mm and length 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

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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 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 boreholes have been presented in the form of soil and rock profile tables in Table Nos.1 to 12 give the details of BH1 to BH6.

7.1.2 The soil profile tables indicate 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 test results

7.1.3 The rock profile tables indicate the description of rock at various depths.

7.2 Analysis of Soil / Rock Profile

7.2.1 A perusal of the data presented in the soil/rock profile tables indicate the presence of the

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following substrata.

a) Stratum - I : Brown sandy silty clay

b) Stratum - II : Brown with white clayey silty sand with gravel

c) Stratum - III : Brown silty sand with gravel

d) Stratum - IV : Brown/Brownish grey completely weathered rock strata (Charnockites based)

7.2.2 The thicknesses in each 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 - 1.1	1.1 - 3	-	3 - 10
2	0.0 - 1.8	1.8 - 3.3	-	3.3 - 10
3	0.0 - 1.5	1.5 - 2.8	-	2.8 - 10
4	0.0 - 1.9	1.9 - 3.4	-	3.4 - 10
5	0.0 - 1.4	1.4 - 2.8	-	2.8 - 10
6	0.0 - 1.3	-	1.3 - 3.7	3.7 - 10

7.2.3 The above results show that :

a) Stratum - I consisting of Brown sandy silty clay having significant percentages of clay and varying percentages of sand and silt, has been encountered from ground level down to 1.1-1.9m depths below existing ground level.

b) Stratum - II consisting of Brown with white clayey silty sand with gravel having significant percentages of sand and varying percentages of clay, silt and gravel, has been encountered form 1.1-1.9m depth down to 2.8-3.4m depth below existing ground level only in boreholes BH1 to BH4 & BH6.

c) Stratum - III consisting of Brown silty sand with gravel having significant

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percentages of sand and varying percentages of silt and gravel, has been encountered from 1.3m depth down to 3.7m depth below existing ground level, only in borehole BH5.

d) Stratum - IV comprising of Brown/Brownish grey completely weathered rock strata (Charnockites based) has been encountered from 2.8-3.7m depth down to the termination depths of boreholes of 10m 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 & 3b.

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

a) Stratum - I : Brown sandy silty clay

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
1	0	26	32	42
2	0	27	33	40
3	0	24	33	43
4	0	22	35	43
5	0	30	34	36
6	0	26	33	41

b) Stratum - II : Brown with white clayey silty sand with gravel

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
1	12	61	17	10
2	16	53	19	12
3	9	69	15	7

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BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
4	11	54	21	14
6	18	54	19	9

This stratum was not encountered in boreholes BH5.

c) Stratum - III : Brown silty sand with gravel

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
5	16	77	7	0

This stratum was encountered only in borehole BH5.

7.3.3 The above results indicate that :

a) Stratum - I consists of about 22-30% of sand, 32-35% of silt, and 36-43% of clay.

b) Stratum - II consists of about 7-14% of clay, 15-21% of silt, 53-69% of sand and 9-18% of gravel.

c) Stratum - III consists of about 7% of silt, 77% of sand and 16% of gravel.

7.4 In-situ Bulk Density, Water Content and Dry density

7.4.1 The in-situ bulk densities, water contents and dry densities obtained from undisturbed soil samples are tabulated below.

BH No.	Depth (m)	In-situ Bulk Density (g/cm^3)	Water Content (%)	Dry Density (g/cm^3)
1	2	1.94	8.7	1.78
2	1.5	1.88	14.1	1.65
3	2	1.93	6.5	1.81
4	1.5	1.86	15.2	1.61
5	2	1.93	6.7	1.81
6	1.5	1.92	7.7	1.78

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7.4.2 The dry densities indicate that the soil strata is in a medium stiff/medium dense state down to depths of refusal strata/rock encountered at 2.8-3.7m depth below existing ground level.

7.5 Consistency Limits

7.5.1 The Consistency Limits determined for the soil in Stratum - I (Brown sandy silty clay) indicate that the liquid limit varies between 47% to 50%, plastic limit varies between 18% to 22% and plasticity index varies between 28% to 29%.

7.5.2 The Consistency Limits determined for the soil in Stratum - II (Brown with white clayey silty sand with gravel) indicate that the liquid limit varies between 19% to 22%, plastic limit is 13% and plasticity index varies between 6% to 9%.

7.5.3 The Consistency Limits of the soil in Stratum - III (Brown silty sand with gravel) indicate that the soil in this strata is non plastic in nature.

7.5.4 The Consistency Limits indicate that the soil in :

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

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

c) Stratum - III (Brown silty sand with gravel) is non plastic in nature.

7.6 Standard Penetration Tests

7.6.1 Standard Penetration Test values (N-values observed) are presented in the soil profile table nos.1 to 12.

7.6.2 The N-values indicate that the soil strata is in a medium stiff/medium dense state down to the depths of refusal/rock strata encountered at 2.8-3.7m depth below existing ground level.

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7.7 Triaxial Test Results

The cohesion 'c' obtained from consolidated drained triaxial compression test varies between negligible to 0.30kg/cm² and the angle of shearing resistance 'ϕ' of the soil varies between 14° and 29°.

7.8 Free Swell Index

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

BH No.	Free Swell Index (%) at depths (m)		
	1	1.5	2.5
1	-	13.6	-
2	45.2	-	14.1
3	-	9.6	-
4	50.2	-	13.9
5	-	8.7	-
6	48.6	-	11.1

7.8.2 The above results indicate that the clayey soil strata (sandy silty clay) is medium swelling in nature. Hence, the excavated clayey soil cannot be used for backfilling purposes.

7.9 Rock Conditions

7.9.1 An analysis of the data provided in the rock profile tables indicates the following :

a) The rock strata generally is brown/brownish grey colored Charnockites based rock.

b) The core recovery is nil.

c) RQD is nil.

7.9.2 The rock strata has been observed to have be in a completely weathered state (generally recognised by nil core recovery) down to the termination depth in all the boreholes.

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7.10 Compiled Soil Rock Profile

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

7.10.2 The above figure shows the various strata encountered and their thicknesses in each of the boreholes and also gives the soil / rock composition and the observed N-values at various depths along with core recovery and RQD.

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

c) Allowable bearing pressure on the soil at the foundation level

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

d) Loading intensity on each sub-structure/structural element.

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

8.2.3 The results of the investigations have shown that the subsoil encountered is in a medium

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stiff/ medium dense state from existing ground level down to the depths of refusal/rock strata encountered at 2.8-3.7m below existing ground level.

8.2.4 In view of the above, *Shallow Foundation -Isolated/Strip Footings* can be adopted for the proposed residential building.

8.3 Depth of Foundations

8.3.1 The depth at which foundations should be laid will be governed by the following criteria.

a) Top filled up strata/loose soil, if any

b) There should be sufficient thickness of soil/rock above the footing/foundations so that the bearing capacity of the soil/rock can be fully mobilised.

c) Soil/rock below the level of footings/foundations should have the requisite strength to support the anticipated bearing pressures on the foundations without allowing the settlement of footings/foundations to exceed the acceptable limits.

d) Requirements of the type of structure

8.3.2 The proposed Residential building will have a single basement, ground floor and five upper floors.

8.3.3 The results of the investigations have shown that refusal/rock strata has been encountered at 2.8-3.7m depth below existing ground level.

8.3.4 In view of the above factors, foundations of the proposed residential building can be made to rest at a depth of *4m below the existing ground level* (considering the single basement). The strata at the founding level will be Brown completely weathered rock strata.

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8.4 Allowable Bearing Pressure

8.4.1 The Allowable bearing pressure in weathered rock strata is based on the provisions given in Table 2 of BIS code IS 12070 - 1987 (RA - 1995).

8.4.2 *Net allowable bearing pressure of 30t/m²* can be adopted for widths of foundations ≥1.5m.

8.4.3 The settlement of foundations resting in completely weathered rock strata will be within 12mm as per IS 13063-1991 (RA 1996).

9.0 RECOMMENDATIONS

9.1 Type of Foundations

Shallow Foundation - Isolated/Strip Footings

9.2 Depth of Foundations

Minimum 4m depth below the existing ground level

9.3 Allowable Bearing Pressure

Net Allowable Bearing Pressure of 30t/m² for Footings of widths ≥1.5m

9.4 Construction Advisories

9.4.1 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.

9.4.2 The excavated clayey soil (sandy silty clay) cannot be used for backfilling purposes as the clayey soil is of medium swelling type.

9.4.3 After the excavation for the foundations, if loose pieces/pockets of weathered rock are encountered, the same shall be removed and backfilled with concrete. A levelling course of concrete shall be laid and the construction of foundations can be taken up subsequently.

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9.4.4 Stiff Tie-beams connecting the columns in both directions may be provided which will render additional rigidity to the structure.

9.5 Appendices

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-A of this report.

9.6 Notes

9.6.1 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.

9.6.2 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.

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Technical Director
For ***NAGADI CONSULTANTS PVT. LTD.***

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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)
5. IS 12070 - 1987 : Design and construction of shallow foundations in rocks (RA - 1995)
6. IS 13063-1991 (RA 1996): Structural safety of buildings on shallow foundations on rocks — Code of practice

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SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | 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											
	1.0	Brown sandy silty clay	0	26	32	42	50	21					
	1.1	Change of strata											
16	1.5	Brown with white clayey silty sand with gravels	12	61	17	10	-	NP					
	2.0	Brown with white clayey silty sand with gravels							1.94	8.7	CD	0.10	27
	3.0	Change of strata											
>100 (135/40cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (99/20cm)	4.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/9cm)	6.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/8cm)	7.5	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/4cm)	9.0	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/2cm)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Job No. G(C)9813

Sheet No. : 1

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 1

Depth (m)	Strata Description	No. of Core Pieces of				Core Recovery (%)						RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
		>75	25-75	10-25	<10	100	80	60	40	20									
3.0	Brown Completely Weathered Rock (Charnockites based)																		
4.5	Brown Completely Weathered Rock (Charnockites based)										Nil	Nil							
6.0	Brown Completely Weathered Rock (Charnockites based)										Nil	Nil							
7.5	Brownish grey Completely Weathered Rock (Charnockites based)										Nil	Nil							
9.0	Brownish grey Completely Weathered Rock (Charnockites based)										Nil	Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)										Nil	Nil							

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Job No.: G(C)9813

Sheet No. : 2

SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | 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											
14	1.0	Brown sandy silty clay	0	27	33	40	48	20					
	1.5	Brown sandy silty clay							1.88	14.1	CD	0.30	15
	1.8	Change of strata											
24	2.5	Brown with white clayey silty sand with gravels	16	53	19	12	22	13					
	3.3	Change of strata											
>100 (91/22cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (60/7cm)	5.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/5cm)	6.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (58/4cm)	8.1	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (60/2cm)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Job No. G(C)9813

Sheet No. : 3

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 2

Depth (m)	Strata Description	No. of Core Pieces of >75	No. of Core Pieces of 25-75	No. of Core Pieces of 10-25	No. of Core Pieces of <10	Core Recovery (%) 100	Core Recovery (%) 80	Core Recovery (%) 60	Core Recovery (%) 40	Core Recovery (%) 20	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
3.3	Brown Completely Weathered Rock (Charnockites based)																	
5.0	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
6.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
8.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							

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SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | B.H. No. : 3

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											
	1.0	Brown sandy silty clay	0	24	33	43	50	22					
	1.5	Change of strata											
25		Brown with white clayey silty sand with gravels	9	69	15	7	-	NP					
	2.0	Brown with white clayey silty sand with gravels							1.93	6.5	CD	0.07	28
	2.8	Change of strata											
>100 (95/22cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (50/9cm)	4.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/7cm)	6.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/3cm)	7.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/2cm)	8.0	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/1cm)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Job No. G(C)9813

Sheet No. : 5

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 3

Depth (m)	Strata Description	No. of Core Pieces of >75	No. of Core Pieces of 25-75	No. of Core Pieces of 10-25	No. of Core Pieces of <10	Core Recovery (%) 100	Core Recovery (%) 80	Core Recovery (%) 60	Core Recovery (%) 40	Core Recovery (%) 20	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
2.8	Brown Completely Weathered Rock (Charnockites based)																	
4.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
6.0	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
7.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
9.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							

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Job No.: G(C)9813

Sheet No. : 6

SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | B.H. No. : 4

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											
10	1.0	Brown sandy silty clay	0	22	35	43	50	21					
	1.5	Brown sandy silty clay							1.86	15.2	CD	0.30	14
	1.9	Change of strata											
31	2.5	Brown with white clayey silty sand with gravels	11	54	21	14	19	13					
	3.4	Change of strata											
>100 (139/35cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (60/10cm)	5.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/5cm)	7.0	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/3cm)	8.5	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/1cm)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Job No. G(C)9813

Sheet No. : 7

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 4

Depth (m)	Strata Description	No. of Core Pieces of >75	No. of Core Pieces of 25-75	No. of Core Pieces of 10-25	No. of Core Pieces of <10	Core Recovery (%) 100	Core Recovery (%) 80	Core Recovery (%) 60	Core Recovery (%) 40	Core Recovery (%) 20	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
3.4	Brown Completely Weathered Rock (Charnockites based)																	
5.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
7.0	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
8.5	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							

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SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | B.H. No. : 5

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											
	1.0	Brown sandy silty clay	0	30	34	36	47	18					
	1.4	Change of strata											
20	1.5	Brown with white silty sand with gravels	16	77	7	0	-	NP					
	2.0	Brown with white silty sand with gravels							1.93	6.7	DS	-	29
	2.8	Change of strata											
>100 (37/35cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (10/17cm)	4.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/7cm)	6.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/3cm)	7.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/Nil)	9.0	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/Nil)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Job No. G(C)9813

Sheet No. : 9

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 5

Depth (m)	Strata Description	No. of Core Pieces of >75	No. of Core Pieces of 25-75	No. of Core Pieces of 10-25	No. of Core Pieces of <10	Core Recovery (%) 100	Core Recovery (%) 80	Core Recovery (%) 60	Core Recovery (%) 40	Core Recovery (%) 20	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
2.8	Brown Completely Weathered Rock (Charnockites based)																	
4.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
6.0	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
7.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
9.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							

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Job No.: G(C)9813

Sheet No. 10

SOIL PROFILE

Project: Residential Building at Vilankurichi Village, Coimbatore.

B. H. Location: | Water Table: Not met | Term. Depth : 10.0m | B.H. No. : 6

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											
14	1.0	Brown sandy silty clay	0	26	33	41	48	20					
	1.3	Change of strata											
	1.5	Brown with white clayey silty sand with gravels							1.92	7.7	CD	0.09	28
44	2.5	Brown with white clayey silty sand with gravels	18	54	19	9	-	NP					
	3.7	Change of strata											
>100 (92/26cm)		Brown Completely Weathered Rock (Charnockites based)											
>100 (50/10cm)	5.5	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/5cm)	7.0	Brown Completely Weathered Rock (Charnockites based)											
>100 (50/3cm)	8.5	Brownish grey Completely Weathered Rock (Charnockites based)											
>100 (50/2cm)	10.0	Brownish grey Completely Weathered Rock (Charnockites based)											

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

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Sheet No. : 11

ROCK PROFILE

Project : Residential Building at Vilankurichi Village, Coimbatore. | Location :

B.H. Size : | Water Table (m) : Not met | Term. Depth (m) : 10.0m | BH No.: 6

Depth (m)	Strata Description	No. of Core Pieces of >75	No. of Core Pieces of 25-75	No. of Core Pieces of 10-25	No. of Core Pieces of <10	Core Recovery (%) 100	Core Recovery (%) 80	Core Recovery (%) 60	Core Recovery (%) 40	Core Recovery (%) 20	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
2.7	Brown Completely Weathered Rock (Charnockites based)																	
5.5	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
7.0	Brown Completely Weathered Rock (Charnockites based)					Nil					Nil							
8.5	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							
10.0	Brownish grey Completely Weathered Rock (Charnockites based)					Nil					Nil							

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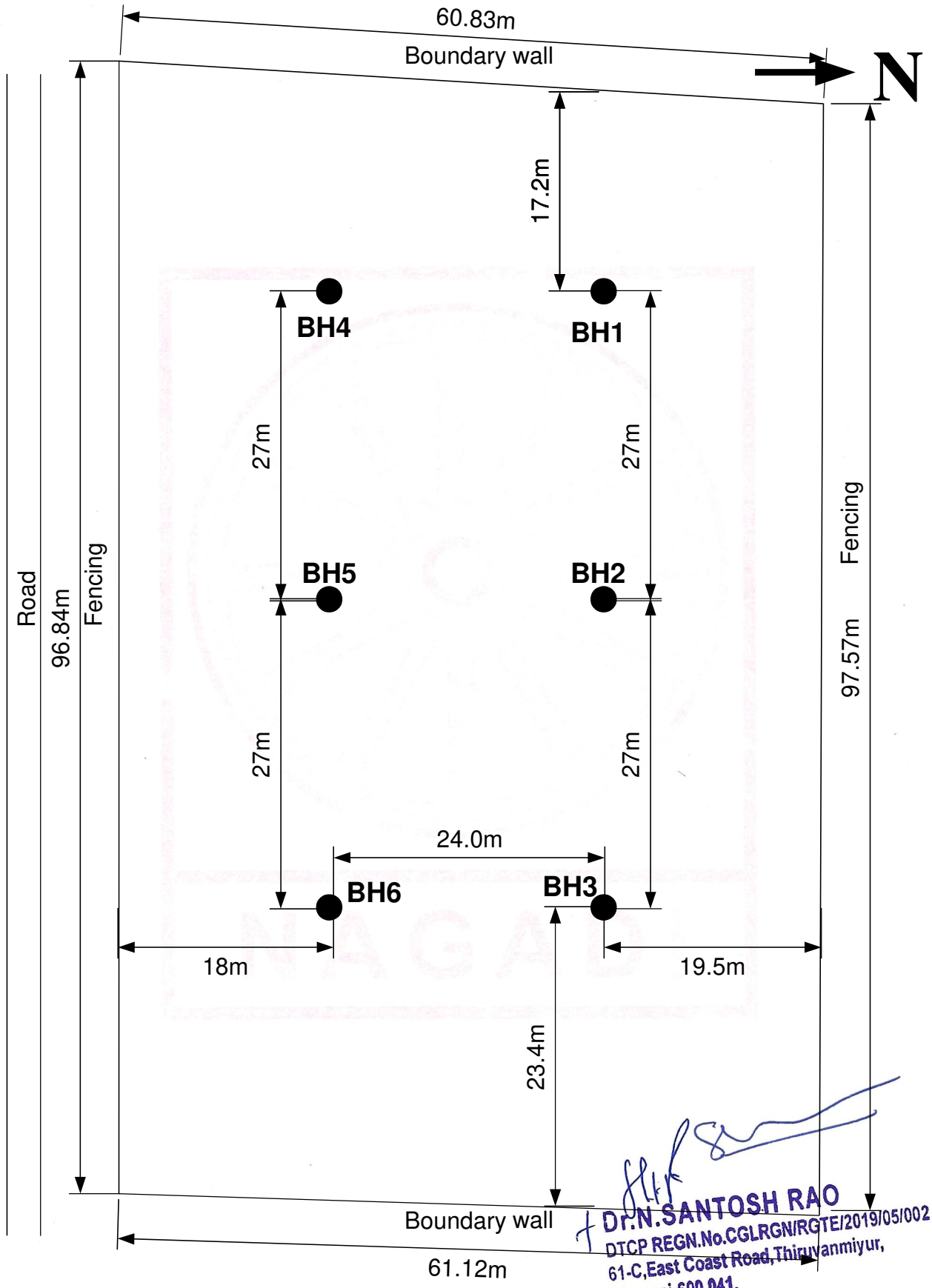
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Sheet No. 12



SCHEMATIC SITE PLAN

(Not to Scale)

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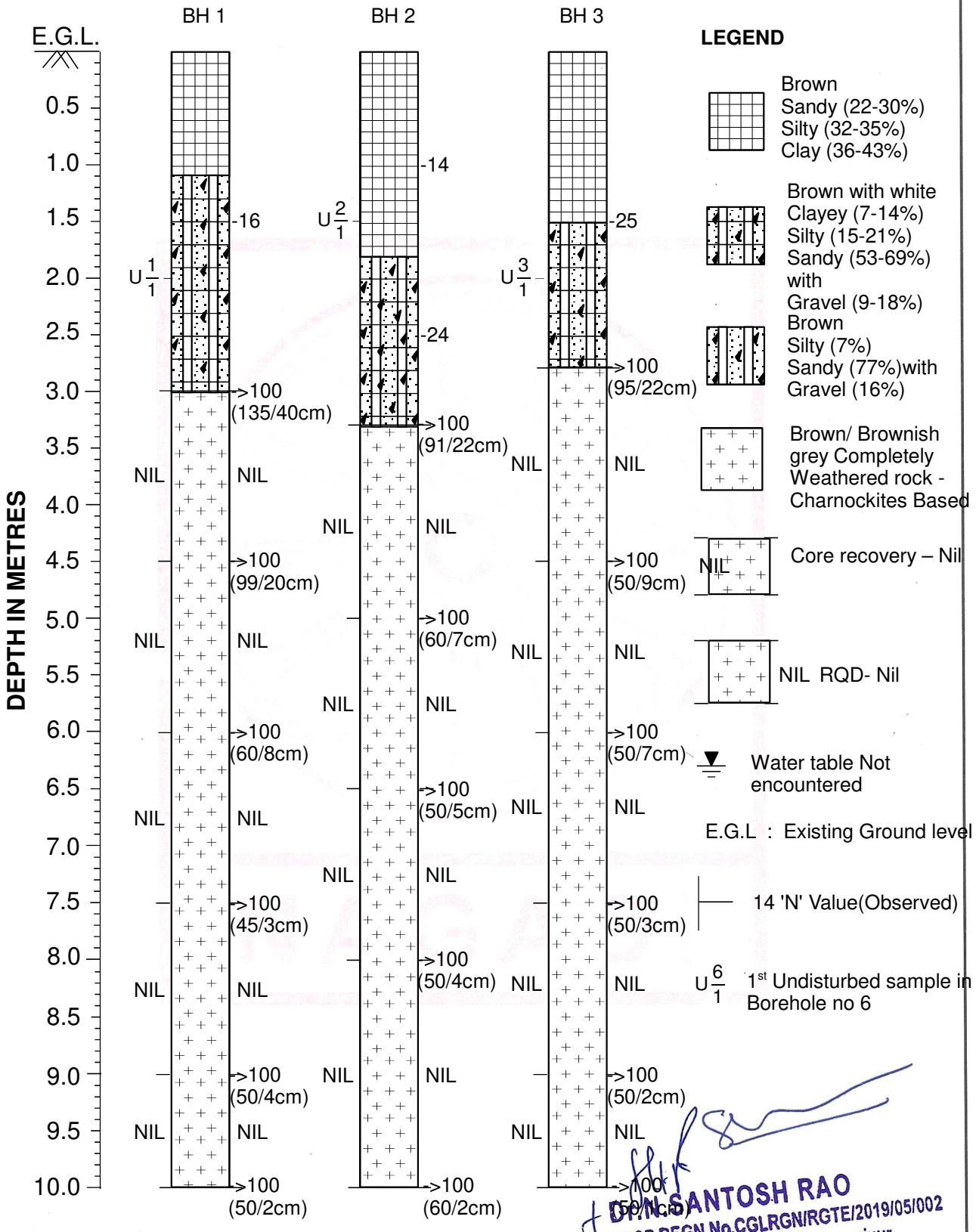
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Job No. : G(C)9813

Sheet No. : 1



GEOTECHNICAL INVESTIGATION FOR RESIDENTIAL BUILDING AT VILANKURICHI VILLAGE, COIMBATORE

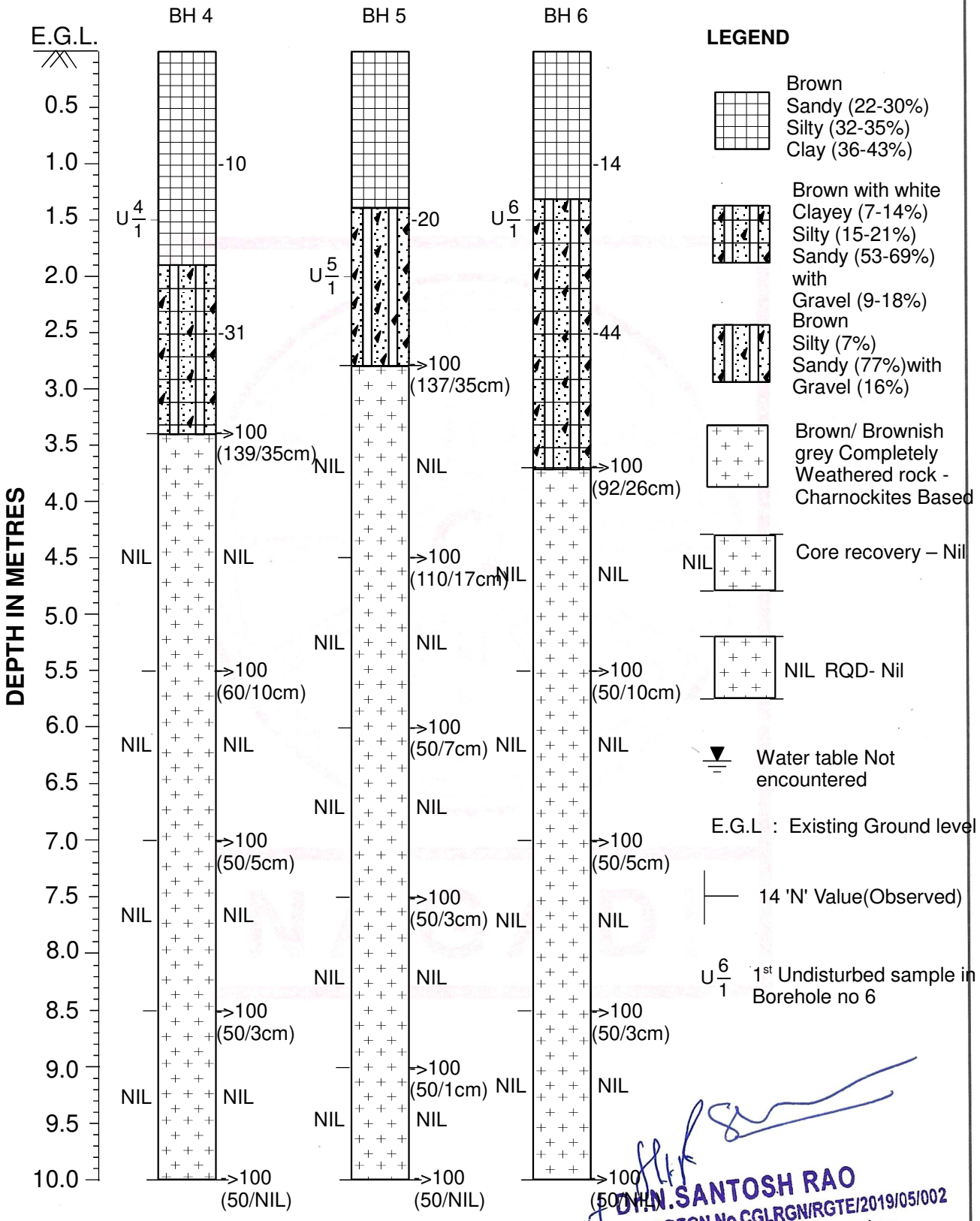
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Job No. : G(C)9813

Sheet No. : 2a



GEOTECHNICAL INVESTIGATION FOR RESIDENTIAL BUILDING AT VILANKURICHI VILLAGE, COIMBATORE

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Job No. : G(C)9813

Sheet No. : 2b

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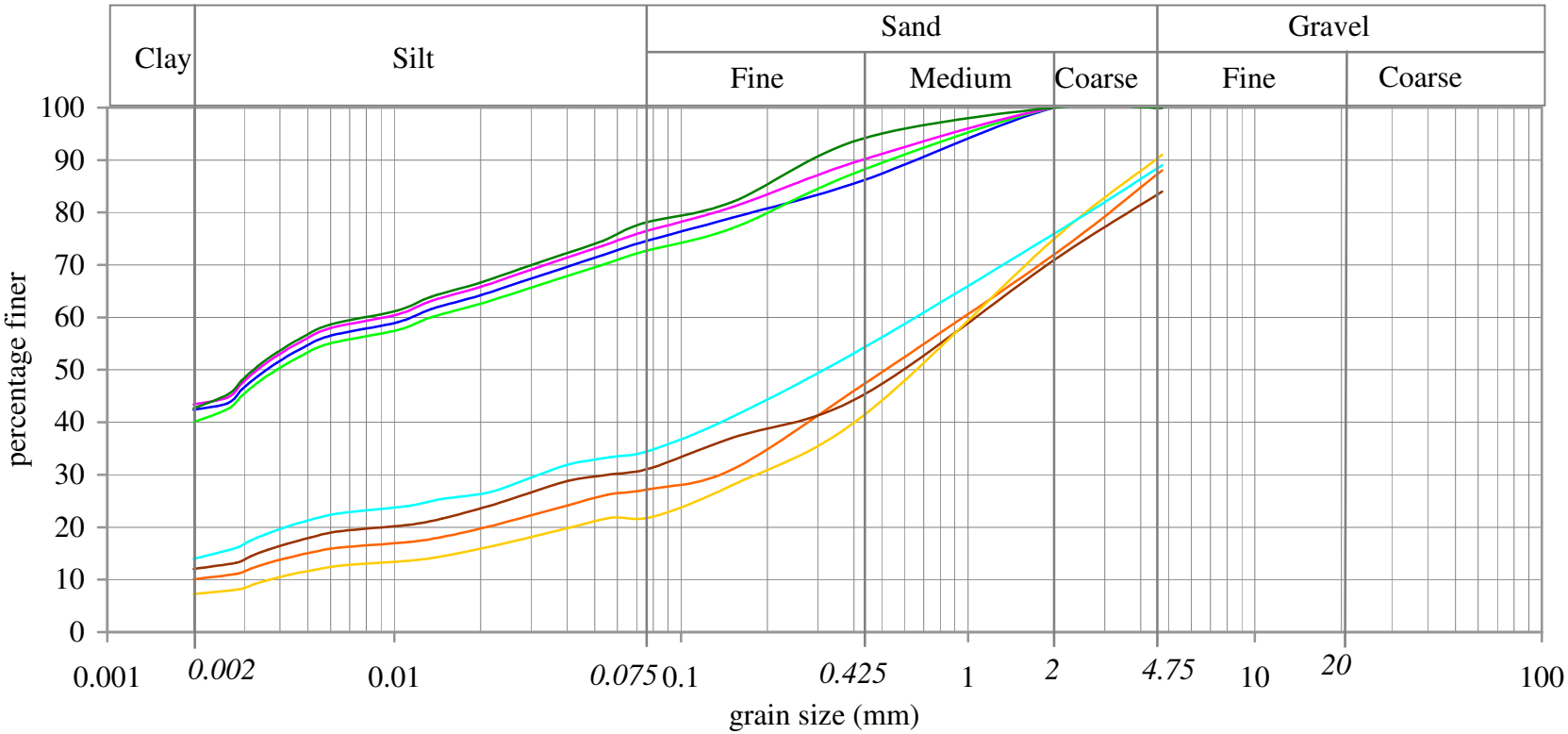
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Job No.: G(C)9813

Sheet No.: 3a



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	1	1.0	Sandy silty clay	0	26	32	42	0.120	-	-
	1	1.5	Clayey silty sand with gravel	12	61	17	10	1.100	0.002	550.0
	2	1.0	Sandy silty clay	0	27	33	40	0.014	-	-
	2	2.5	Clayey silty sand with gravel	16	53	19	12	1.200	-	-
	3	1.0	Sandy silty clay	0	24	33	43	0.009	-	-
	3	1.5	Clayey silty sand with gravel	9	69	15	7	0.990	-	-
	4	1.0	Sandy silty clay	0	22	35	43	0.008	-	-
	4	2.5	Clayey silty sand with gravel	11	54	21	14	0.650	-	-

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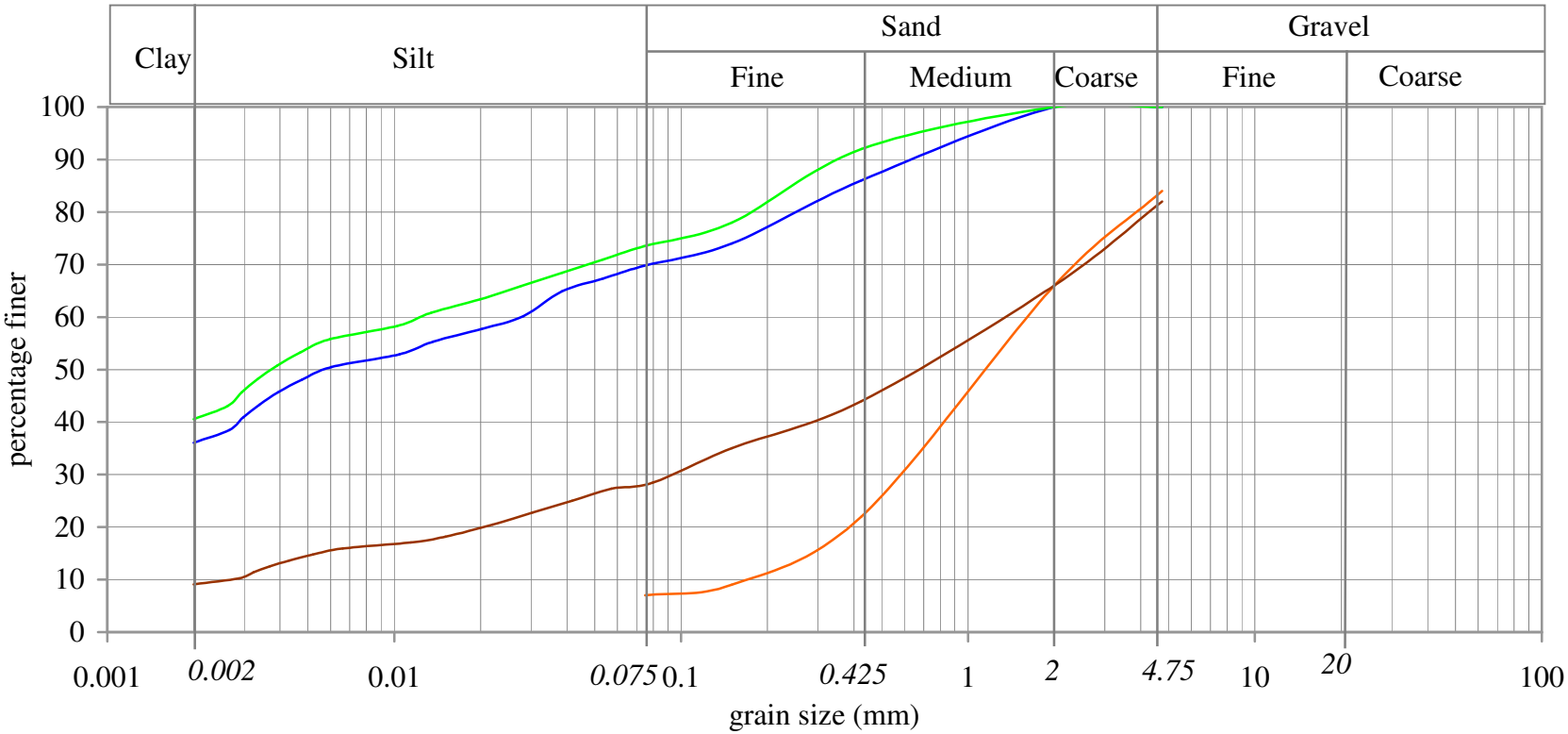
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Job No.: G(C)9813

Sheet No. : 3b



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	5	1.0	Sandy silty clay	0	30	34	36	0.028	-	-
	5	1.5	Silty sand with gravel	16	77	7	0	1.600	0.17	9.4
	6	1.0	Sandy silty clay	0	26	33	41	0.013	-	-
	6	2.5	Clayey silty sand with gravel	18	54	19	9	1.400	0.0028	500.0

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