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GEOTECHNICAL REPORT FOR

RESIDENTIAL BUILDING AT PADUR VILLAGE, THIRUPORUR TALUK, CHENGALPET DISTRICT

Client :

M/s. Nest Zone India Pvt Ltd.
Chennai.

Architect :

Consultant :

Structural Consultant :

Job No. : GCE/0853

Date : 22.09.2023

NAGADI CONSULTANTS PRIVATE LIMITED

Branch : Chennai

For NEST ZONE INDIA (P) LTD.

Managing Director

Project :

RESIDENTIAL BUILDING AT PADUR VILLAGE, THIRUPORUR TALUK, CHENGALPET DISTRICT

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For NEST ZONE INDIA (P) LTD.

Managing Director

Job No. : G(C)9853 Date : 22.08.2023

GEOTECHNICAL INVESTIGATION REPORT

for Residential Building at Padur Village,

Thiruporur Taluk, Chengalpet District

EXECUTIVE SUMMARY

M/s. Nest Zone India Pvt Ltd., Chennai are proposing to construct a Residential Building "Nest Mojo" at Padur Village, Thiruporur Taluk, Chengalpet District.

The site for the proposed residential building is situated at Survey No. 365/5B, 366/1 which is a either side corner plot with Modern Layout second main road on the western side and roads on the northern and southern sides in Padur Village, Thiruporur Taluk, Chengalpet District. The site measures approximately 1.42 acres in area. The site is open on all the sides and is fairly level in topography. The site is lower than the Modern Layout main road by about 0.3m.

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 5 boreholes down to 8m depth or refusal strata (where N>50); whichever is met earlier.

The results of borehole investigations have shown the presence of brown clayey silty sand with or without gravel / brown silty sand with gravel / brown silty clayey sand with gravel down to 2.5-3.6m below the existing ground level at which refusal strata in the form of completely weathered rock was encountered.

The soil strata is in a medium dense state down to the depths of refusal strata encountered between 2.5-3.6m depth below existing ground level.

Ground water table was encountered between 2.7m and 3.3m depth in the boreholes 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 *Shallow Foundations - Isolated /Strip Footings laid at a minimum depth of 2m below the existing ground level. Net allowable bearing pressures that can be adopted at different depths for different widths of foundations are given below:*

Depth of Foundations Below EGL (m)	***Allowable Settlement (mm)***	***Net Allowable Bearing Pressure (t/m²) for Widths of Foundations (m)***	
		1.5	***≥3***
2	*40*	*17*	*20*
0.3m in weathered rock strata	*12*	*30*	*30*

The excavated soil can be used for backfilling purposes.

After the excavation for the foundations, The foundation surface should be watered for at least 24 hours. The top slush should then be removed and the surface compacted heavily. If any loose pockets are observed, the same shall be filled with brickbats/ gravel and compacted well. Foundations can subsequently be placed over such a prepared surface.

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

The foundations might be laid at different levels to ensure that the foundations are laid 0.3m in weathered rock strata. Care should be taken to ensure that the foundations are laid at a minimum of 0.3m in weathered rock or 1.75m depth below existing ground level; whichever is deeper.

For NEST ZONE INDIA (P) LTD.

Managing Director

REPORT ON GEOTECHNICAL INVESTIGATION FOR RESIDENTIAL BUILDING AT PADUR VILLAGE, THIRUPORUR TALUK, CHENGALPET DISTRICT

1.0 INTRODUCTION

1.1 Overview

1.1.1 M/s. Nest Zone India Pvt Ltd., Chennai are proposing to construct a Residential Building "Nest Mojo" at Padur Village, Thiruporur Taluk, Chengalpet District.

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

1.2 Authority

A detailed geotechnical investigations programme has been conducted as per the authorisation by Nest Zone India Pvt Ltd., Chennai vide their confirmation mail dated 06.08.2023.

2.0 PROJECT DETAILS

2.1 Site Location

The site for the proposed residential building is situated at Survey No. 365/5B, 366/1 which is a either side corner plot with Modern Layout second main road on the western side and roads on the northern and southern sides in Padur Village, Thiruporur Taluk, Chengalpet District.

2.2 Site Layout and Topography

2.2.1 The site measures approximately 1.42 acres in area. The site is open on all the sides and is fairly level in topography. The site is lower than the Modern Layout main road by about 0.3m.

2.2.2 The colour of the exposed soil surface is Brown/Brownish red.

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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 Padur Village, Thiruporur Taluk, Chengalpet District which falls under Seismic Zone III as per IS 1893 (Part 1) - 2016.

2.5 Geographical Information

2.5.1 The site for the proposed residential building is situated at:

a) Latitude : 12°48'

b) Longitude : 80°13'

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.

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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 5 boreholes down to 8m depth or refusal strata (where N>50); whichever is met earlier, as required by the client.

b) Conducting standard penetration tests at 1.0m 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 second week of August 2023.

5.2 Boreholes

5.2.1 The boreholes were progressed by shell and auger method.

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5.2.2 The boreholes were terminated at refusal strata where further augering and penetration were not possible. The refusal strata encountered is completely weathered rock (Charnockite Based). The N-value in refusal strata is >50.

5.2.3 The depths at which ground water table was encountered in the boreholes during the field investigations and termination depths of the boreholes are given below.

Borehole No.	Depth of Water Table Below EGL (m)	Termination Depth Below EGL (m)
1	2.8	3
2	2.8	3.5
3	2.7	3.2
4	3.2	3.7
5	3.3	3.8

5.2.4 Ground water table was encountered between 2.7m and 3.3m in the boreholes during the period of field investigations.

5.2.5 Standard Penetration Tests were conducted in soil strata at 1.0m depth intervals.

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

5.2.7 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

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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 boreholes have been presented in the form of soil profile tables in Table Nos.1 to 5.

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 compression test results

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7.2 Analysis of Soil Profile

7.2.1 A perusal of the data presented in the soil profile tables indicate the presence of the following substrata.

a) Stratum - I : Brown silty sand with or without gravel

b) Stratum - II : Brown/Brownish red clayey silty sand with or without gravel

c) Stratum - III : Brown silty clayey sand with or without gravel

d) Stratum - IV : Brownish yellow/grey completely weathered rock (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 - 2.5	-	-	2.5 - 3
2	0.0 - 3	-	-	3 - 3.5
3	0.4 - 1.8	0.0 - 0.4	1.8 - 3	3 - 3.2
4	-	0.0 - 0.6	0.6 - 3.5	3.5 - 3.7
5	-	0.0 - 0.4	0.4 - 3.6	3.6 - 3.8

7.2.3 The above results show that :

a) Stratum - I comprising of Brown silty sand with or without having significant percentages of sand and varying percentages of silt, has been encountered from ground level/0.4m to 1.8/2.5/3m depth below the existing ground level only at the locations of boreholes BH1, BH2 and BH3.

b) Stratum - II comprising of Brown clayey silty sand with or without gravel having significant percentages of sand and varying percentages of gravel, silt

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and clay, has been encountered from ground level to 0.4/0.6m depth below the existing ground level only at the locations of boreholes BH3, BH4 and BH5.

c) Stratum - III comprising of Brown silty clayey sand with or without gravel having significant percentages of sand and varying percentages of gravel, silt and clay, has been encountered from 0.4/0.6/1.8m to 3/3.5/3.6m depth below the existing ground level only at the locations of boreholes BH3, BH4 and BH5.

d) Stratum - IV comprising of Refusal strata in the form of completely weathered rock strata (Charnockite Based) was encountered from 2.5/3/3.5/3.6m to 3/3.2/3.53.7/3.8m depth down to 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 fig. 3a & 3b.

7.3.2 The variations in the grain size distribution of the soil in different strata across the boreholes are as follows:

a) Stratum - I : Brown silty sand with or without gravel

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
1	0 - 14	66 - 82	18 - 20	0
2	0 - 36	46 - 81	18 - 19	0
3	26	54	20	0

This stratum was encountered only at the locations of boreholes BH1, BH2 and BH3.

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b) Stratum - II : Brown/Brownish red clayey silty sand with or without gravel

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
3	1	76	11	11
4	2	75	12	11
5	0	75	13	11

This stratum was encountered only at the locations of boreholes BH3, BH4 and BH5.

c) Stratum - III : Brown silty clayey sand with or without gravel

BH No.	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
3	16	48	17	19
4	0	68	14	18
5	0	68 - 73	11 - 14	17 - 18

This stratum was encountered only at the locations of boreholes BH3, BH4 and BH5.

7.3.3 The above results indicate that :

a) Stratum - I consists of about 18 - 20% of silt, 54 - 82% of sand and 0 - 36% of gravel.

b) Stratum - II consists of about 11% of clay, 11 - 12% of silt, 75 - 76% of sand and 0 - 2% of gravel.

c) Stratum - III consists of about 17 - 19% of clay, 11 - 17% of silt, 48 - 73% of sand and 0 - 16% of gravel.

7.4 In-situ Density and Water Content

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

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BH No.	Depth (m)	In-situ Bulk Density (g/cm^3)	Water Content (%)	Dry Density (g/cm^3)
1	1.5	1.86	6.9	1.74
2	2	1.92	6.1	1.81
3	1.5	1.94	5.7	1.84
4	1.5	1.90	11.6	1.70
	3	2.09	15.2	1.81
5	2	1.93	14.6	1.68

7.4.2 The dry densities indicate that the subsoil is in a medium dense state down to the depths of refusal strata encountered between 2.5/3.6m depth below existing ground level.

7.5 Consistency Limits

7.5.1 The Consistency Limits determined for the soil in Stratum - I (Brown silty sand with or without gravel) indicate that the soil in this stratum is non plastic in nature.

7.5.2 The Consistency Limits determined for the soil in Stratum - II (Brown clayey silty sand with or without gravel) indicate that the soil in this stratum is non plastic in nature.

7.5.3 The Consistency Limits determined for the soil in Stratum - III (Brown silty clayey sand with or without gravel) indicate that the liquid limit varies between 20 - 26%, plastic limit varies between 13 - 15% and plasticity index varies between 7 - 12% .

7.5.4 The Consistency Limits indicate that the soil in :

a) Stratum - I (Brown silty sand with gravel) is non plastic in nature.

b) Stratum - II (Brown clayey silty sand with or without gravel) is non plastic in nature.

c) Stratum - III (Brown silty clayey sand with or without gravel) is low plastic in nature.

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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 5.

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

7.6.3 The subsoil strata is in a medium dense state with observed N-values ranging between 12 and 44 down to refusal strata encountered between 2.5/3.6m depth below existing ground level.

7.7 Triaxial Test Results

The cohesion 'c' obtained from consolidated drained triaxial test varies between 0.12kg/cm² & 0.13kg/cm² and the angle of shearing resistance 'ϕ' of the soil varies between 26° & 32°.

7.8 Free Swell Index

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

BH.	Free Swell Index (%) at Depth (m)		
No.	1	1.5	3
1	3.4	-	-
2	-	3.2	-
3	3.1	15.2	-
4	15.6	15.5	-
5	-	14.9	16.2

7.8.2 The above results indicate that the soil strata is low swelling in nature. Hence, the excavated soil can be used for backfilling purposes.

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7.9 Compiled Soil Profile

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

7.9.2 The above figure shows the various strata encountered and their thicknesses in each of the boreholes and also gives the soil composition and the observed N-values at various depths along with the depth at which undisturbed soil samples were collected.

8.0 DESIGN CRITERIA

8.1 Design Parameters

8.1.1 The parameters required for the design of foundation system for the proposed structure 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 ground floor and five upper floors.

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8.2.3 The results of the investigations have shown that the subsoil is in a medium dense state down to the depths of refusal strata encountered at 2.5/3.6m depth below existing ground level.

8.2.4 In view of the above, *Shallow Foundations - 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 above the footing/foundations so that the bearing capacity of the soil can be fully mobilised.

c) Soil 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 (residential building consisting of a ground floor and five upper floors).

8.3.2 The results of investigations have shown the presence of completely weathered rock strata at shallow depths ranging between 2.5-3.6m depth below existing ground level.

8.3.3 In view of the above factors, foundations of the proposed residential building can be laid at a minimum depth of 2m below the existing ground level. Alternatively, the foundations can be laid at minimum depth of 0.3m in weathered rock strata. The strata available at the founding level will be silty sand with gravel/silty clayey sand or completely weathered rock strata.

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8.4 Allowable Bearing Pressure

8.4.1 Allowable bearing pressure has been evaluated by:

a) Shear failure criteria based on the average soil data

b) Settlement criteria based on the SPT values (N-values)

c) Settlement criteria based on deformation modulus

8.4.2 An allowable settlement of 50mm has been considered to evaluate the allowable bearing pressure for Isolated/Strip Footings.

8.4.3 A water table correction factor of 0.5 has been considered.

8.4.4 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).

8.4.5 On the basis of the above analysis, recommended net allowable bearing pressures at different depths for different widths of foundations are given below:

Depth of Foundations Below EGL (m)	Allowable Settlement (mm)	Net Allowable Bearing Pressure (t/m²) for Foundations of Widths (m)	
		1.5	≥3
2	40	17	20
0.3m in completely weathered rock strata	12	30	30

9.0 RECOMMENDATIONS

9.1 Type of Foundations

Shallow Foundations - Isolated/Strip Footings

9.2 Depth of Foundations

a) Minimum 2m depth below existing ground level OR

b) 0.3m in weathered rock strata

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9.3 Allowable Bearing Pressure

Net allowable bearing pressures at different depths for different widths of foundations are given below:

Depth of Foundations Below EGL (m)	*Allowable Settlement (mm)*	*Net Allowable Bearing Pressure (t/m²) for Foundations of Widths (m)*	
		1.5	*≥3*
2	*40*	*17*	*20*
0.3m in completely weathered rock strata	*12*	*30*	*30*

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 soil can be used for backfilling purposes.

9.4.3 After the excavation for the foundations, The foundation surface should be watered for at least 24 hours. The top slush should then be removed and the surface compacted heavily. If any loose pockets are observed, the same shall be filled with brickbats/ gravel and compacted well. Foundations can subsequently be placed over such a prepared surface.

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

9.4.5 The foundations might be laid at different levels to ensure that the foundations are laid 0.3m in weathered rock strata. Care should be taken to ensure that all the foundations are laid at a minimum of 0.3m in weathered rock or 1.75m depth below existing ground

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level; whichever is deeper.

9.5 Appendices

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

9.5.2 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.

9.6 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.

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

For NEST ZONE INDIA (P) LTD.

Managing Director

ANALYSIS FOR ALLOWABLE BEARING PRESSURE

Data

(i) Soil Properties :

c (kg/cm^2) = 0.12 $\phi = 26°$ γ (g/cm^3) = 1.9

(ii) Depth of Foundation, D (m) = 2

(iii) Allowable Settlement, s (mm) = 40

Shear Failure Criterion (Ref. IS : 6403)

$N_c = 19.2$ $N_q = 9.65$ $N_\gamma = 9.71$ $R_w = 0.50$ $R_w' = 0.50$

(considering average of twice general shear failure and once local shear value)

$$q_s = \frac{1}{2.5}\left(c \cdot N_c + \gamma D \cdot N_q \cdot R_w + 0.5 \cdot \gamma \cdot B \cdot N_\gamma \cdot R'_w\right) - \gamma D$$

B (m)	1.5	≥3.0
q_s (t/m^2)	17.4	20.2

Settlement Criterion (Ref. IS : 8009)

(i) From N Values

B (m)	1.5	≥3.0
H (m)	1.5	1.5
N_{av}	25	28
q_a (t/m^2)	21.9	20.9

(ii) From Triaxial Compression Tests : $q_a = \frac{s \cdot E}{0.7 \cdot H}$

B (m)	1.5	≥3.0
H (m)	1.5	1.5
E (kg/cm^2)	90	115
q_a (t/m^2)	34.29	43.81

The lower of the above is to be adopted.

ADOPT	B (m)	1.5	≥3
	q (t/m^2)	17	20

Note : q_s and q_a are NET VALUES, Weight of backfill etc. need not be added to the loading except in case of filling above original G.L.

For NEST ZONE INDIA (P) LTD.
Director

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

For NESTZONE INDIA (P) LTD.
Managing Director

TABLES

For NEST ZONE INDIA (P) LTD.

Managing Director

NAGADI

SOIL PROFILE

Project: Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District - 603103

B.H. Location: | Water Table: 2.8m | Term. Depth : 3.0m | 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											
	0.5	Brown silty sand	0	82	18	0	-	NP					
	0.7	Change of strata											
15	1.0	Brown silty sand with gravel	14	66	20	0	-	NP					
	1.5	Brown silty sand with gravel							1.86	6.9	DS	-	29
>50 (54/27cm)	2.5	Change of strata											
		Brownish yellow completely weathered rock											
	3.0	Termination Depth											

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

For NEST ZONE INDIA (P) LTD.

Managing Director

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Job No. : G(C)9853

Sheet No. : 1

SOIL PROFILE

Project: Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District - 603103

B.H. Location: | Water Table: 2.8m | Term. Depth : 3.5m | 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											
	1.0	Brown silty sand	0	81	19	0	-	NP					
	1.5	Change of strata											
19		Brown silty sand with gravel	36	46	18	0	-	NP					
	2.0	Brown silty sand with gravel							1.92	6.1	DS	-	31
	2.5	Change of strata											
>50 (62/30cm)	3.0	Brownish grey completely weathered rock											
	3.5	Termination Depth											

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

For NESTZONE INDIA (P) LTD.

Managing Director

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Job No. : G(C)9853

Sheet No. : 2

SOIL PROFILE

Project: Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District - 603103

B.H. Location: | Water Table: 2.7m | Term. Depth : 3.2m | 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/cm³)	Water Cont (%)	Type	c (kg/cm²)	ϕ (°)
	0.0	Ground level											
	0.3	Brown clayey silty sand with gravel	1	76	11	11	-	NP					
	0.4	Change of strata											
21	1.0	Brown silty sand with gravel	26	54	20	0	-	NP					
	1.5	Brown silty sand with gravel							1.94	5.7	DS	-	32
	1.8	Change of strata											
44	2.5	Brown silty clayey sand with gravel	16	48	17	19	23	15					
>50 (59/32cm)	3.0	Change of strata											
		Brownish completely weathered rock											
	3.2	Termination Depth											

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

For NEST ZONE INDIA (P) LTD.

Managing Director

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Job No. : G(C)9853

Sheet No. : 3

SOIL PROFILE

Project: Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District - 603103

B.H. Location: | Water Table: 3.2m | Term. Depth : 3.7m | B.H. No. : 4

N - Value#	Depth (m)	Soil Description	Grain Size Analysis: Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Atterberg Limits: Liquid (%)	Plastic (%)	In-situ properties: Density* (g/cm³)	Water Cont (%)	Triaxial Test: Type	c (kg/cm²)	ϕ (°)
	0.0	Ground level											
	0.5	Brown clayey silty sand with gravel	2	75	12	11	-	NP					
	0.6	Change of strata											
12	1.0	Brownish red silty clayey sand	0	68	14	18	21	13	1.90	11.6	CD	0.12	26
	1.5	Brownish red silty clayey sand											
26	2.5	Brownish red silty clayey sand	0	68	14	18	22	13	2.09	15.2	CD	0.13	28
	3.0	Brownish red silty clayey sand											
>50 (77/25cm)	3.5	Change of strata											
		Brownish yellow completely weathered rock											
	3.7	Termination Depth											

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

For NEST ZONE INDIA (P) LTD.

Managing Director

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Job No. : G(C)9853

Sheet No. : 4

SOIL PROFILE

Project: Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District - 603103

B.H. Location: | Water Table: 3.3m | Term. Depth : 3.7m | 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/cm³)	Water Cont (%)	Type	c (kg/cm²)	Φ (°)
	0.0	Ground level											
	0.3	Brown clayey silty sand	0	75	13	11	-	NP					
	0.4	Change of strata											
15	1.5	Brownish red silty clayey sand	0	73	11	17	20	13					
	2.0	Brownish red silty clayey sand							1.93	14.6	CD	0.13	27
35	3.0	Brownish red silty clayey sand	0	68	14	18	26	14					
>50 (81/20cm)	3.6	Change of strata											
		Brownish yellow completely weathered rock											
	3.8	Termination Depth											

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

For NEST ZONE INDIA (P) LTD.

Managing Director

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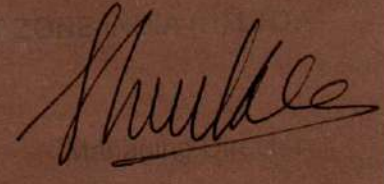
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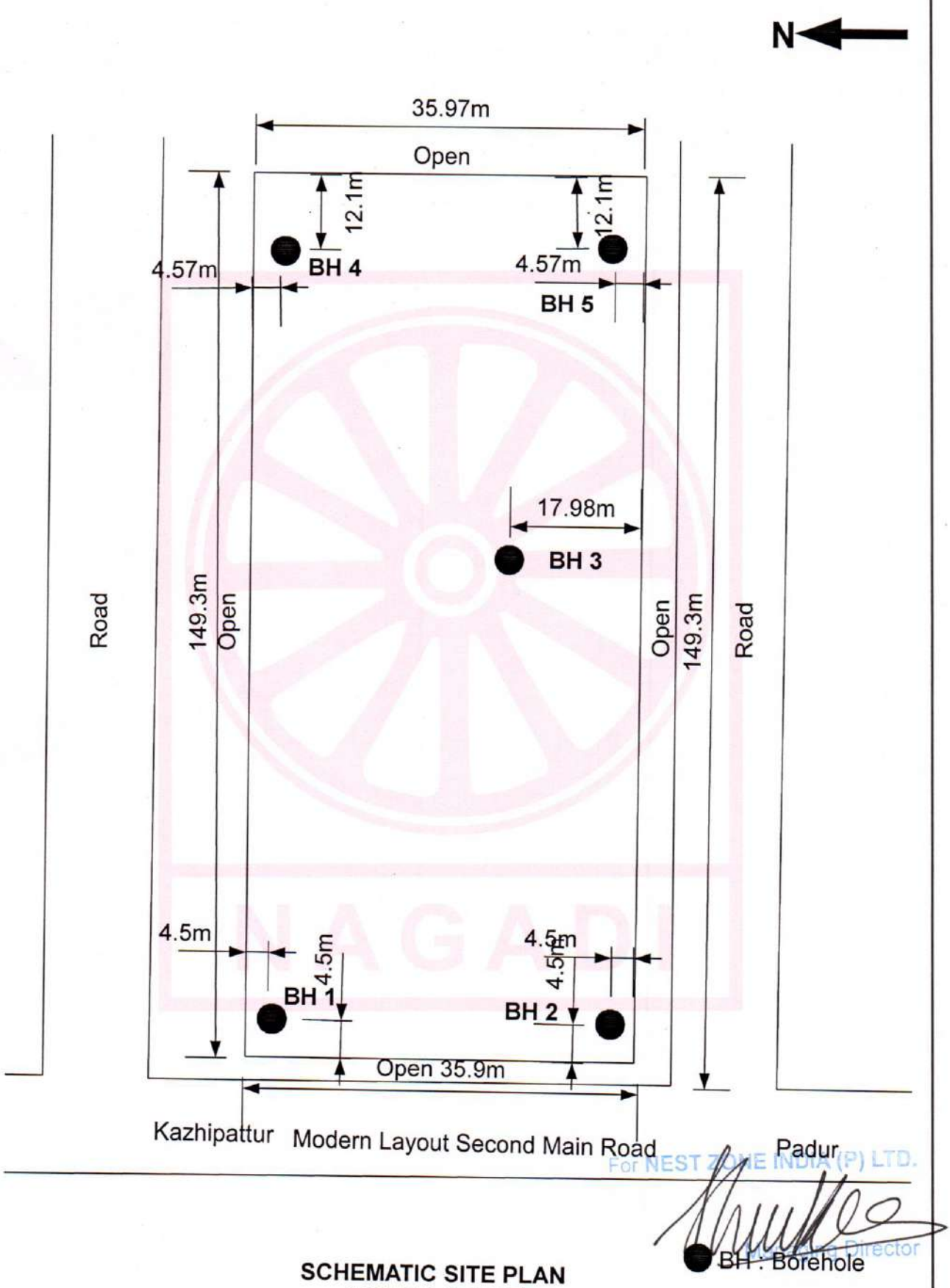
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FIGURES



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For NEST ZONE INDIA (P) LTD.

Authorised Director

SCHEMATIC SITE PLAN
(NOT TO SCALE)

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COMPILED SOIL PROFILE

PROJECT : Residential Building at S.No.365/5B, 366/1, Padur Village, Thiruporur Taluk, Chengalpet District

For NEST ZONE INDIA (P) LTD.

Managing Director

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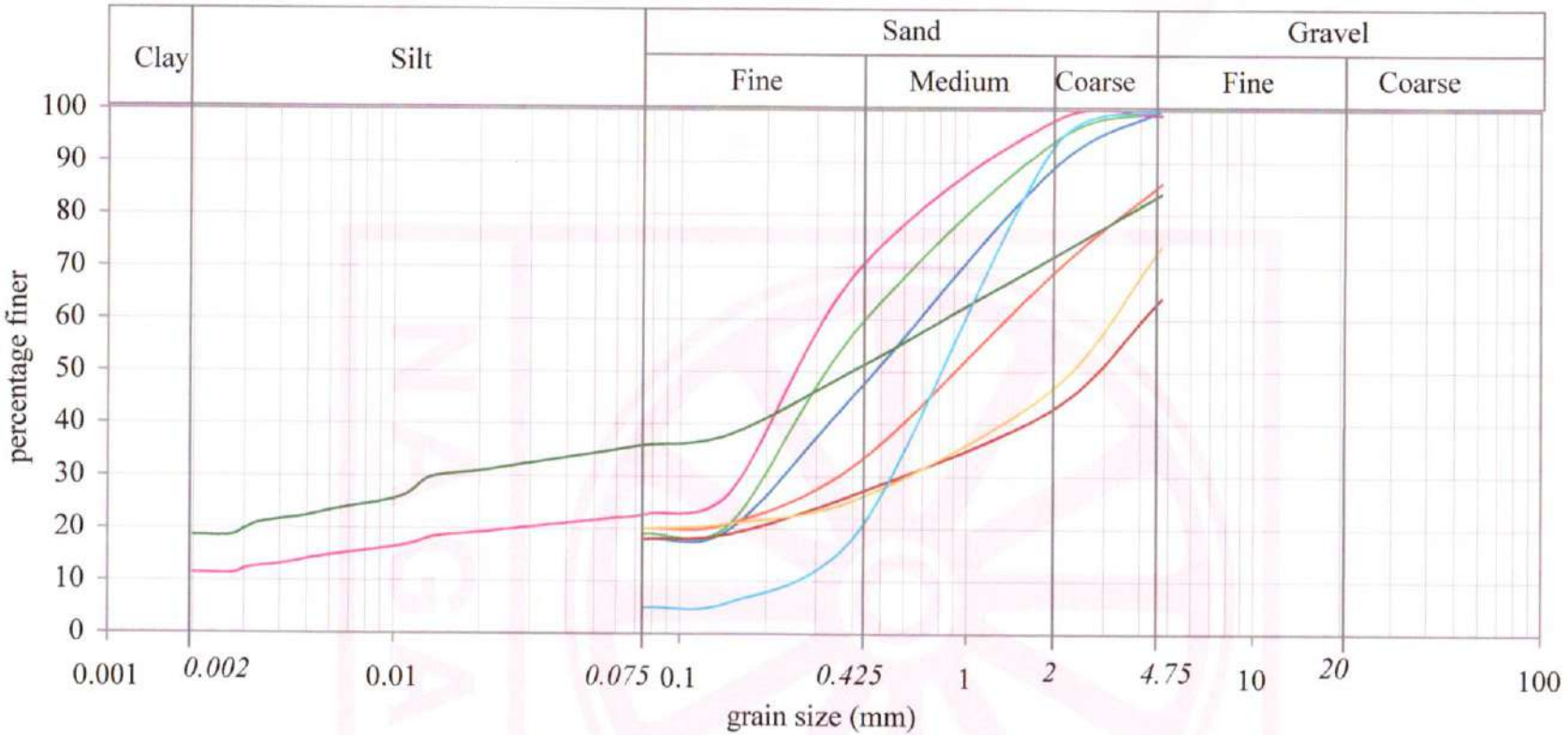
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Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	1	0.5	Silty sand	0	82	18	0	0.390	-	
	1	1.0	Silty sand with gravel	14	66	20	0	0.627	-	
	2	1.0	Silty sand	0	81	19	0	0.316		
	2	1.5	Silty sand with gravel	36	46	18	0	0.315		
	3	0.3	Clayey silty sand with gravel	1	76	11	11	0.630		
	3	1.0	Silty sand with gravel	26	54	20	0	0.629		
	3	2.5	Clayey silty sand with gravel	16	48	17	19	0.926		

Job No: 9853

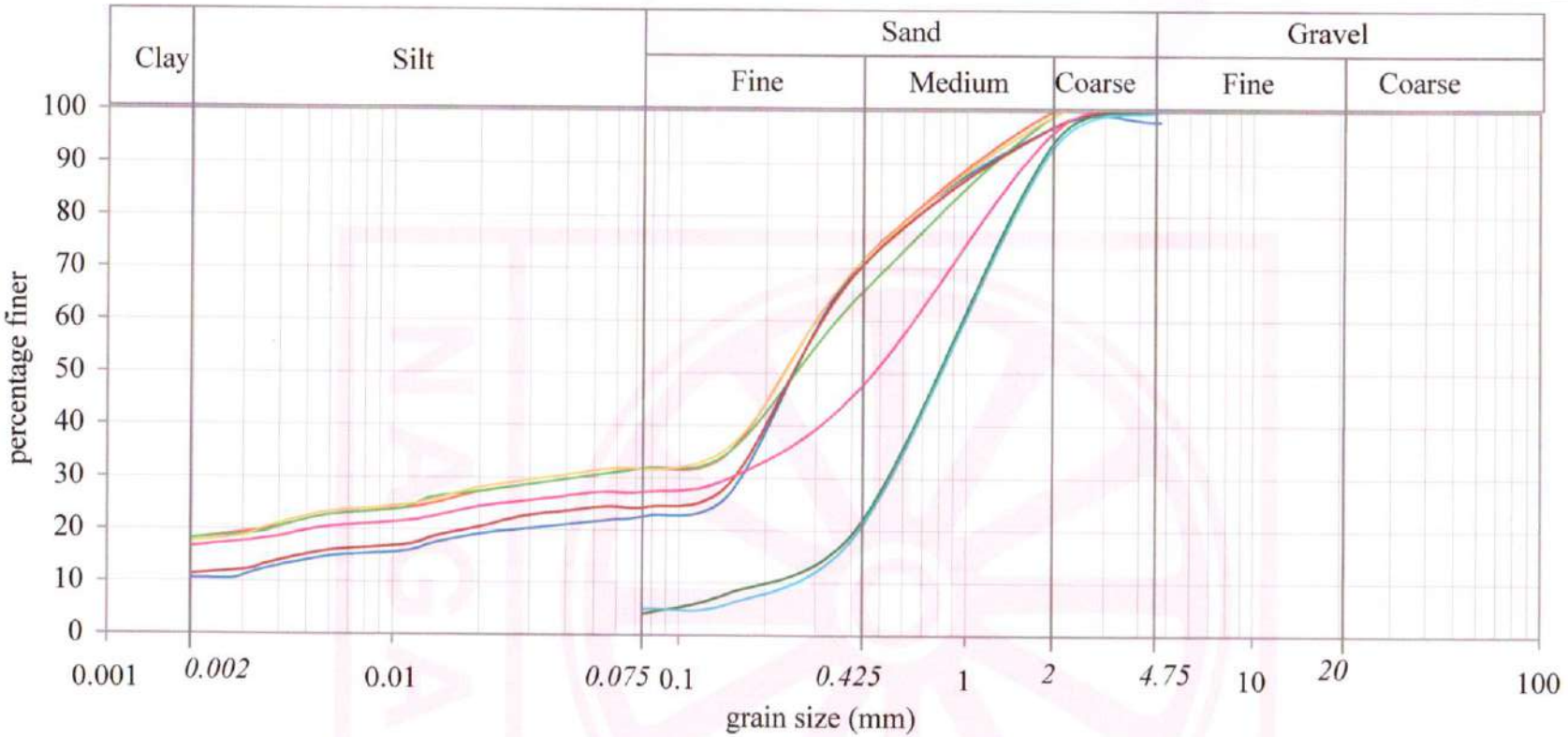
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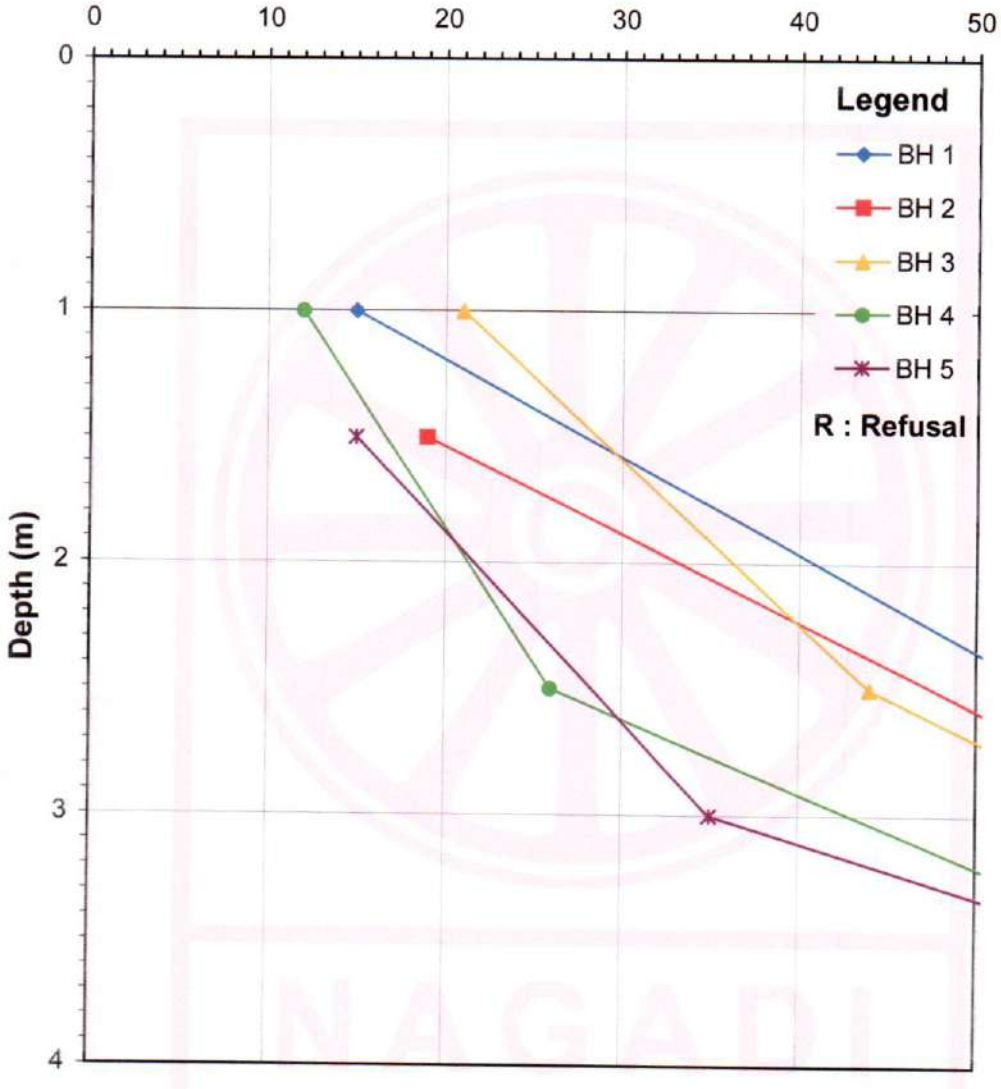


Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
	4	0.5	Clayey silty sand with gravel	2	75	12	11	0.390	-	
	4	1.0	Clayey silty sand with gravel	0	68	14	18	0.627	-	
	4	2.5	Clayey silty sand with gravel	0	68	14	18	0.316		
	5	0.3	Clayey silty sand	0	75	13	11	0.315		
	5	1.5	Clayey silty sand	0	73	11	17	0.630	-	
	5	3.0	Clayey silty sand	0	100	-18	18	0.629	-	

Job No. : GC/9853

Sheet No. : 3b

SPT Values (Observed)



SPT Values (Observed) Vs Depth Curves

For NEST ZONE INDIA (P) LTD.

Managing Director

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Compliance & Special Services

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empowering your real estate decisions with smart tools

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Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

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