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Date: 10/05/2023

To

Mr. Bharat Doshi and Others,
No. 83/32,
Purasaiwalkam,
Chennai-600084.

Subject: Geotechnical Investigation Report for the Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at S.Nos. 287/.5A, 5B, 5C, 5D and etc., Chengalpattu District, MLPA, Thiruporur Panchayat Union, Vada Nemmeli Village, Hamlet of Thiruvidanthai.

Dear Sir,

We have enclosed the detailed Report (**Ref. No. R2305081**) of Geotechnical Investigation Conducted for Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at S.Nos. 287/.5A, 5B, 5C, 5D and etc., Chengalpattu District, MLPA, Thiruporur Panchayat Union, Vada Nemmeli Village, Hamlet of Thiruvidanthai with suitable Foundation Recommendations. If any clarification is required, you may feel free to contact us. We assure you of our Best Technical Service.

Thanks & Regards

R. SHARVESH, M.E.
(Technical In-charge)

For **Minerva Civil Testing Lab Private Ltd**

Er. M. Ammaiappan, B.E., M.E. (Geo Tech), (Ph.D)
Registered Geo Technical Engineer
DTCP - Reg. No : TVLR/RGTE/2021/06/002
Thirumullaivoyal, Chennai - 600 062

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

DISCLAIMER

This report has been prepared by the experts of Geotechnical Engineer by the assessment of portions of the soil at the specified location. The authors of this report are in no way responsible for the behavior of materials used by contractors or the drawbacks that may occur in the proposed structure with time and depending on the environment to which the structure may be exposed.

For **Minerva Civil Testing Lab Private Ltd**

R. Sharvesh

R. SHARVESH, M.E.

(Technical In-charge)

Er. M. Ammaiappan, B.E. M.E. (Geo Tech), (Ph.D)
Registered Geo Technical Engineer
DTCP - Reg. No. TVLR/RGTE/2021/06/002
Thirumullaivoyal, Chennai - 600 062

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

GEOTECHNICAL INVESTIGATION REPORT

Report No.: R2305081 **Job No.:** J2304047 **Date:** 10/05/2023
Ref. No.: MCTL/Q/004/2023

Geotechnical Investigation Report for the Proposed Construction of Residential Building for

Client:

Mr. Bharat Doshi and Others,
No. 83/32,
Purasaiwalkam,
Chennai-600084.

Project Location:

S.Nos. 287 /5A, 5B, 5C, 5D and etc,
Chengalpattu District, MLPA,
Thiruporur Panchayat Union,
Vada Nemmeli Village,
Hamlet of Thiruvidanthai.

Minerva Civil Testing Lab Private Limited
No.5/357A, Near CTS,
Okkiyampettai Okkiyam
Thoraipakkam, OMR
Chennai - 600097
Contact: 9551677795, 9790976966, 044 – 42059520

Period of Testing: 19/04/2023 - 08/05/2023

R. Thaqiver

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

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R. Thadivel

For GT Bharathi Urban Developers Pvt Ltd

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1. Introduction:

This report presents the Geotechnical Investigation performed for the Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at S.Nos. 287/5A, 5B, 5C, 5D and etc., Chengalpattu District, MLPA, Thiruporur Panchayat Union, Vada Nemmeli Village, Hamlet of Thiruvidanthai for which M/s Minerva Civil Testing Lab Private Ltd was approached by the client to conduct Geotechnical Investigation for the design and construction of the structure.

For the construction of any structure a detailed Soil Investigation is essential for collecting the relevant data required for preparing the design. The sub surface investigation reveals the presence and the extent of soil and rock stratum in the region likely to be affected by the proposed work and determines the nature of each stratum and engineering properties of soil which may affect the design. The data collected provide reliable, specific and detailed information to facilitate a safe and economic design of the proposed structure.

2. Scope of Work:

Conducting field test to assess the safe bearing capacity (SBC) and allowable bearing pressure, at shallow depth of the soil stratum present in the proposed site, the Bore Hole Depth had been terminated as per Client Requirements.

3. Method of Exploration:

Mechanical rotary drilling with auger of dia. 150 mm has been used for making bore holes. Soil samples were collected at regular intervals and at change of layer and samples were also recovered from the SPT spoon sampler and marked with proper labeling for transporting them to our laboratory for testing.

4. Field Test:

Penetration and sounding tests are the generally adopted field tests. Standard penetration test is performed as per IS: 2131-1981 as an in-situ test especially for cohesion less soils. The resistance is empirically correlated with some of the engineering properties of soil such as density index, consistency, bearing capacity etc.

These tests are useful for general exploration of erratic soil profiles for finding depth to bed rock or hard stratum and to have an approximate indication of the strength and other properties of soils particularly for cohesion less soil where it is difficult to obtain Undisturbed Soil samples(UDS).

In the field, the standard penetration test sampler is driven by the free fall of a hammer weighing 63.5 kg dropped from a height of 75 cm. The sampler is initially driven through 15 cm as a seating drive. It is further driven through 30 cm. The number of blows required to drive the sampler for the 30cm below the seating drive is termed as the Penetration Resistance ('N' value).

R. Thoniyel

For GT Bharathi Urban Developers Pvt Ltd

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8. Assessment of Safe Bearing Capacity (SBC):

Based on the field test (SPT) conducted at the site as per IS 2131:1981 (Reaff-2016), the bearing capacity has been assessed as per the IS 6403:1981. The SBC of soil is evaluated using the equation given below,

$$Q_d = Q\,(N_q-1).S_q.d_q.i_q+0.5*B.\gamma.N_\gamma.S_\gamma.d_\gamma.i_\gamma.W'$$ *(for cohesion less soil) ---- (1)*

$$Q_d = C.N_c.S_c.d_c.I_c$$ *(for cohesive soil) ---- (2)*

as given in the clause 5.2.2.1 and 5.3.1 of IS 6403:1981 (Reaff-2016)

Table – 1: **Safe Bearing Capacity of Soil for Isolated Square Footing**

BH No.	Breadth (m)	Depth (m)	Safe Bearing Pressure in kPa	Allowable Bearing Pressure in kPa	Total Settlement in mm
	1.5	2.0	139	130	25
1	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
	1.5	2.0	139	130	25
2	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
	1.5	2.0	139	130	25
3	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
	1.5	2.0	174	155	25
4	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
	1.5	2.0	139	130	25
5	2.0	2.5	231	210	25
	2.5	3.0	317	280	25

R. Thadiveyl

For GT Bharathi Urban Developers Pvt Ltd

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Table – 1: **Safe Bearing Capacity of Soil for Isolated Square Footing**

BH No.	Breadth (m)	Depth (m)	Safe Bearing Pressure in kPa	Allowable Bearing Pressure in kPa	Total Settlement in mm
6	1.5	2.0	174	155	25
	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
7	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
8	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
9	1.5	2.0	209	195	25
	2.0	2.5	349	290	25
	2.5	3.0	481	330	25
10	1.5	2.0	174	155	25
	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
11	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	289	25

R. Thadiveg

For GT Bharathi Urban Developers Pvt Ltd

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Table – 1: **Safe Bearing Capacity of Soil for Isolated Square Footing**

BH No.	Breadth (m)	Depth (m)	Safe Bearing Pressure in kPa	Allowable Bearing Pressure in kPa	Total Settlement in mm
6	1.5	2.0	174	155	25
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	2.5	3.0	317	280	25
8	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
9	1.5	2.0	209	195	25
	2.0	2.5	349	290	25
	2.5	3.0	481	330	25
10	1.5	2.0	174	155	25
	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
11	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Thaiyu

Table – 1: **Safe Bearing Capacity of Soil for Isolated Square Footing**

BH No.	Breadth (m)	Depth (m)	Safe Bearing Pressure in kPa	Allowable Bearing Pressure in kPa	Total Settlement in mm
6	1.5	2.0	174	155	25
	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
7	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
8	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25
9	1.5	2.0	209	195	25
	2.0	2.5	349	290	25
	2.5	3.0	481	330	25
10	1.5	2.0	174	155	25
	2.0	2.5	289	230	25
	2.5	3.0	397	310	25
11	1.5	2.0	139	130	25
	2.0	2.5	231	210	25
	2.5	3.0	317	280	25

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Thaiyu

Table – 2: **Safe Bearing Capacity of Soil for Raft Foundation 5m x 5m**

BH No.	Breadth (m)	Depth (m)	Allowable Bearing Pressure in kPa	Total Settlement in mm
1 to 18	5	2.0	100	50
	5	2.5	100	50
	5	3.0	100	50

9. Assessment of Pile Load carrying Capacity:

The ultimate load capacity (Q_u) of piles, in kN, in Granular soils is given by the following formula:

$$Q_u = A_p \left(\frac{1}{2} D \gamma N_\gamma + P_D N_q \right) + \sum_{i=1}^{n} K_i P_{Di} \tan \delta_i A_{si}$$

For Cohesive Soil

$$Q_u = A_p N_c C_p + \sum_{i=1}^{n} \alpha_i C_i A_{si}$$

Where,

9.

A_p	*Cross-Sectional Area of Pile Tip, in m^2*
D	*Diameter of Pile Shaft, in m*
γ	*Effective Unit Weight of the Soil at Pile Tip, in kN/m^3*
N_γ, N_c & N_q	*Bearing Capacity Factors Depending Upon and the Angle of Internal Friction, at Pile Tip*
P_D	*Effective Overburden Pressure at Pile Tip, in kN/m^2*
K_i	*Coefficient of Earth Pressure Applicable for the i^{th} layer*
P_{Di}	*Effective Overburden Pressure for the i^{th} layer, in kN/m^2*
δ_i	*Angle of Wall Friction Between Pile And Soil for the i^{th} layer*
A_{si}	*Surface Area of Pile Shaft in the i^{th} layer, in m^2*
C_i	*Average Cohesion at Pile Shaft for the i^{th} layer, (kN/m^2)*
C_p	*Average Cohesion at Pile Tip, (kN/m^2)*
α_i	*Adhesion Factor for the i^{th} layer*

For GT Bharathi Urban Developers Pvt Ltd

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Table No: 3 Load Carrying Capacity for Pile Foundation

BH No	Depth	Pile Diameter (D) in m	Safe Axial Capacity in kN	Safe Uplift Capacity in kN	Safe Lateral Capacity for Free Headed Pile in kN	Safe Lateral Capacity for Fixed Headed Pile in kN
1 to 18	16+3*D	0.45	276	37	45	106
		0.50	336	42	48	126
		0.60	474	50	62	168
		0.70	635	58	85	217

**- Self Weight of Pile is not included in Uplift Capacity*

Note: The behavior of the pile is not only depends upon the soil parameters (theoretical load carrying capacity estimates) but also on the execution skill and care, it is mandatory to conduct prototype pile load tests as per the guidelines laid down in IS: 2911-part-iv to confirm the theoretical estimates, before proceeding with the execution work

10. Recommendations:

Type of Foundation: **Isolated Footing** may be provided for all RCC Framed structure. Proper Shoring must be provided while excavating the soil for Isolated Footing.

Alternatively, Raft Foundation or Pile Foundation (Refer Table 2 and Table 3) can be provided, if Isolated Footing is not desired.

The recommendations given in this report have been evaluated 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 on the basis of design and executions experience in the field of the signing authority.

11. Conclusion:

This geotechnical investigation has been carried out on the specified location as representing the entire site. If there is any change in sub-soil conditions and properties at places, between or beyond the test locations this office may be contacted for further actions.

R. Sharvesh

R. SHARVESH, M.E.
(Geotechnical Engineer)

Er. M. Ammaiappan, B.E., M.E., (Geo Tech), (Ph.D)
Registered Geo Technical Engineer
DTCP - Reg. No : TVLR/RGTE/2021/06/002
Thirumullaivoyal, Chennai - 600 062

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

Table – 4: **ABSTRACT REPORT**

Site Location	S.Nos. 287/5A, 5B, 5C, 5D and etc., Chengalpattu District. MLPA, Thiruporur Panchayat Union. Vada Nemmeli Village. Hamlet of Thiruvidanthai
Geotechnical Investigation conducted for	**Mr. Bharat Doshi and Others,** No. 83/32, Purasaiwalkam, Chennai-600084.
Recommended Type of Foundation	**Isolated Footing**
Allowable Bearing Capacity	**130 kPa** at **2.0m** from the EGL for Isolated Square Footing. Refer Table 1 for SBC at various depths and Boreholes.

Er. M. Ammaiappan, B.E., M.E., (Geo Tech), (Ph.D)
Registered Geo Technical Engineer
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Thirumullaivoyal, Chennai - 600 062

For
Minerva Civil Testing Lab Private Ltd

R. Sharvesh

R. SHARVESH, M.E.
Geotechnical Engineer

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

Annexure

*(for reference only)

Table – 5: ***Correlation between the 'N'-value and consistency nature of Fine-grained soils***

Sl. No.	'N' - Value	Unconfined Compression Strength (Kg/cm²)	Consistency
1.	2 – 5	0.25 – 0.5	*Very Soft*
2.	5 – 9	0.5 – 1.0	*Medium*
3.	9 – 17	1.0 – 2.0	*Stiff*
4.	17 – 33	2.0 – 4.0	*Very Stiff*
5.	> 33	> 4.0	*Hard*

Table – 6: ***Correlation between the 'N'- value and Relative density of Coarse-grained soils***

Sl. No.	'N' - Value	Relative Density (%)	Description
1.	< 4	<15	*Very Loose*
2.	4 -10	15 - 60	*Loose*
3.	10 - 30	60 - 75	*Medium*
4.	30 - 50	75 - 90	*Dense*
5.	> 50	> 90	*Very Dense*

R. Thaqiver

For GT Bharathi Urban Developers Pvt Ltd

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FIELD PHOTOGRAPHS







R. Thaguvey

For GT Bharathi Urban Developers Pvt Ltd

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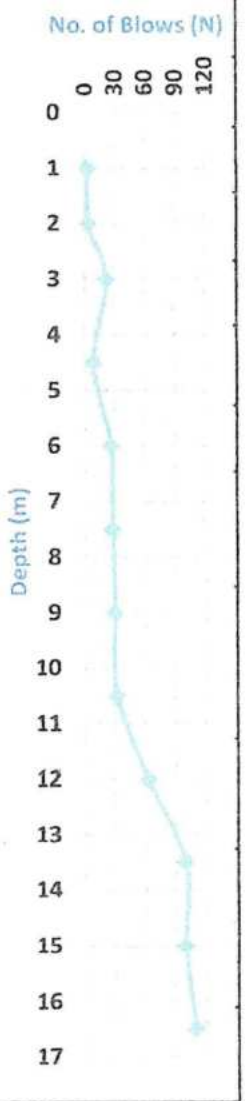
Bore Log

&

Summary of Laboratory Results

BORE LOG 1

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-6.0	SM		1	3	2	1	3	Inorganic Soil, Non Plastic Silty Sand	
			2	3	2	2	4		
			3	6	10	12	22		
			4.5	3	4	5	9		
			6	7	12	14	26		
6.0-9.0	SC		7.5	9	13	15	28	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	9	13	17	30		
9.0-10.5	CI		10.5	8	13	19	32	Inorganic Soil, Intermediate Compressible Clay	
10.5-12.0	SC		12	18	27	36	63	Inorganic Soil, Intermediate Compressible Clayey Sand	
12.0-13.5	SM		13.5	19	51	49	100	Inorganic Soil, Non Plastic Silty Sand	
13.5-15.0	SC		15	>50/10 cm Balance			>50	Inorganic Soil, Intermediate Compressible Clayey Sand	
15.0-16.5	SDR		16.50	>100/15 cm Balance			>100	Soft Disintegrated Rock	
Borehole - 1 Terminated at 16.5 m									



*N - Recorded N Value

R. Thaivey

For GT Bharathi Urban Developers Pvt Ltd

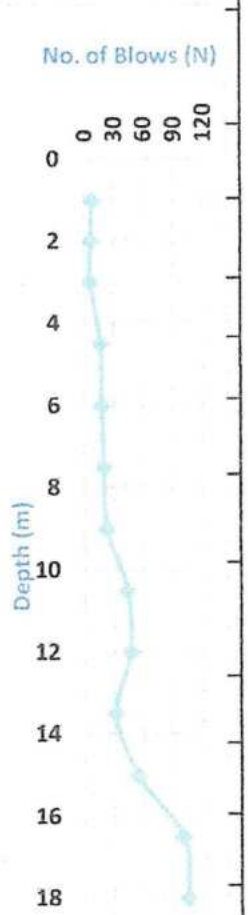
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BORE LOG 2

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.				
Drilling method:	Rotary drilling	**Dia of bore:** 150 mm		**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023			**Date of Completion:** 24/04/2023		

Strata Depth (m)	Soil Type	Soil Profile	Standard Penetration Test Result					Description of Soil stratum
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP		1	3	3	5	8	Inorganic Soil, Non Plastic Poorly Graded Sand
1.0-3.0	SC		2	2	3	4	7	Inorganic Soil, Intermediate Compressible Clayey Sand
			3	3	3	4	7	
3.0-6.0	SM		4.5	7	8	9	17	Inorganic Soil, Non Plastic Silty Sand
			6	8	8	10	18	
6.0-9.0	SC		7.5	7	9	11	20	Inorganic Soil, Intermediate Compressible Clayey Sand
			9	8	10	13	23	
9.0-10.5	CI		10.5	10	16	28	44	Inorganic Soil, Intermediate Compressible Clay
10.5-15.0	SC		12	9	18	29	47	Inorganic Soil, Intermediate Compressible Clayey Sand
			13.5	10	15	17	32	
			15	11	23	31	54	
15.0-18.0	SDR		16.50	>100/15 cm Balance			>100	Soft Disintegrated Rock
			18.00	>100/25 cm Balance			>100	

Graphical Representation of Penetration Resistance



Borehole - 2 Terminated at 18.0 m

*N - Recorded N Value

R. Thanigavel

For GT Bharathi Urban Developers Pvt Ltd

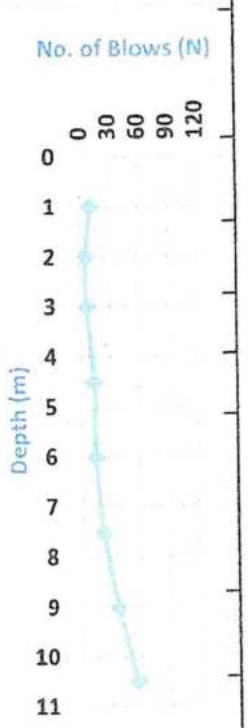
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BORE LOG 3

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.		
Drilling method:	Rotary drilling	**Dia of bore:** 150 mm	**GWT:** - 5.0 m
Date of Commencement: 19/04/2023		**Date of Completion:** 24/04/2023	

Strata Depth (m)	Soil Type	Soil Profile	Standard Penetration Test Result					Description of Soil stratum
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP-SM		1	4	5	6	11	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
1.0-6.0	SM		2	2	3	3	6	Inorganic Soil, Non Plastic Silty Sand
			3	3	3	4	7	
			4.5	5	6	8	14	
			6	8	8	7	15	
6.0-7.5	SC		7.5	8	9	13	22	Inorganic Soil, Intermediate Compressible Clayey Sand
7.5-10.5	CI		9	10	18	19	37	Inorganic Soil, Intermediate Compressible Clay
			10.5	13	22	34	56	

Graphical Representation of Penetration Resistance



Borehole - 3 Terminated at 10.5 m

*N - Recorded N Value

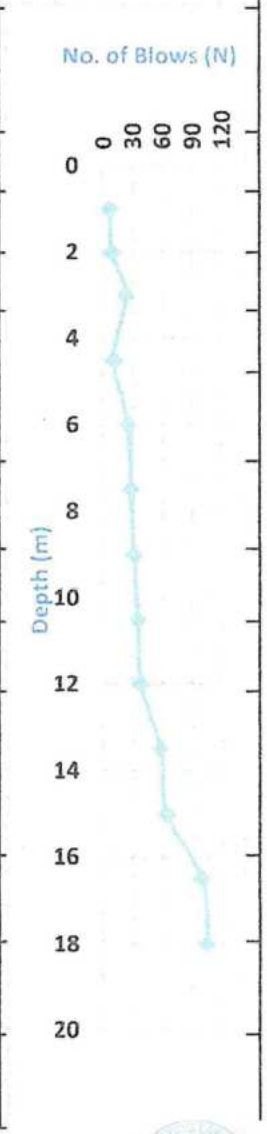
R. Thangaraj

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 4

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	3	3	4	7	Inorganic Soil, Non Plastic Poorly Graded Sand	
1.0-6.0	SM		2	2	3	6	9	Inorganic Soil, Non Plastic Silty Sand	
			3	6	10	13	23		
			4.5	3	4	7	11		
			6	6	11	14	25		
6.0-9.0	SC		7.5	9	13	15	28	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	10	14	17	31		
9.0-12.0	CI		10.5	10	15	20	35	Inorganic Soil, Intermediate Compressible Clay	
			12	12	16	22	38		
12.0-13.5	SC		13.5	19	28	30	58	Inorganic Soil, Intermediate Compressible Clayey Sand	
13.5-15.0	SM		15	20	30	34	64	Inorganic Soil, Non Plastic Silty Sand	
15.0-18.0	SDR		16.50	>100/15 cm Balance			>100	Soft Disintegrated Rock	
			18.00	>100/15 cm Balance			>100		



Borehole - 4 Terminated at 18.0 m

*N - Recorded N Value

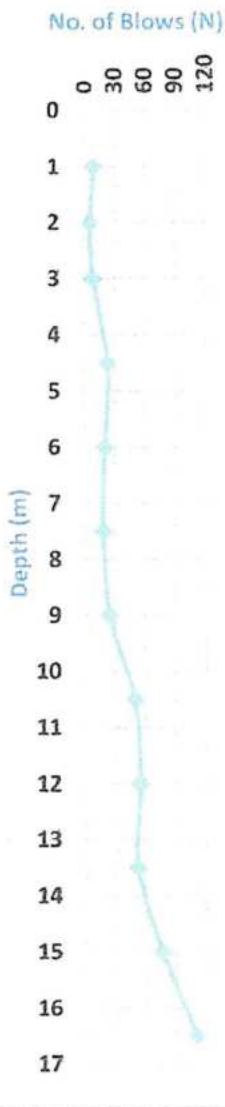
R. Thulasi

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 5

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023	
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**				**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP		1	4	5	5	10	Inorganic Soil, Non Plastic Poorly Graded Sand
1.0-6.0	SM		2	2	3	3	6	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
			3	3	4	5	9	
			4.5	7	10	13	23	
			6	10	12	8	20	
6.0-9.0	SC		7.5	6	8	10	18	Inorganic Soil, Intermediate Compressible Clayey Sand
			9	8	11	13	24	
9.0-10.5	SM		10.5	12	17	32	49	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
10.5-12.0	SC		12	13	18	36	54	Inorganic Soil, Intermediate Compressible Clayey Sand
12.0-13.5	SM		13.5	10	20	32	52	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
13.5-15.0	SC		15	22	29	47	76	Inorganic Soil, Intermediate Compressible Clayey Sand
15.0-16.5	SDR		16.50	>100/15 cm Balance			>100	Sodt Disintegrated Rock
Borehole - 5 Terminated at 16.5 m								



*N - Recorded N Value

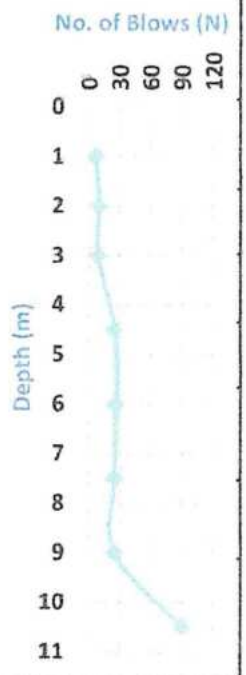
R. Thanvey

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 6

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm		**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023	
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**				**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP		1	3	3	4	7	Inorganic Soil, Non Plastic Poorly Graded Sand
1.0-6.0	SM		2	3	4	6	10	Inorganic Soil, Non Plastic Silty Sand
			3	4	4	5	9	
			4.5	10	11	14	25	
			6	9	12	14	26	
6.0-9.0	SC		7.5	10	12	13	25	Inorganic Soil, Iontermediate Compressible Clayey Sand
			9	8	11	14	25	
9.0-10.5	SM		10.5	28	40	>50	>50	Inorganic Soil, Non Plastic Silty Sand
Borehole - 6 Terminated at 10.5 m								



*N - Recorded N Value

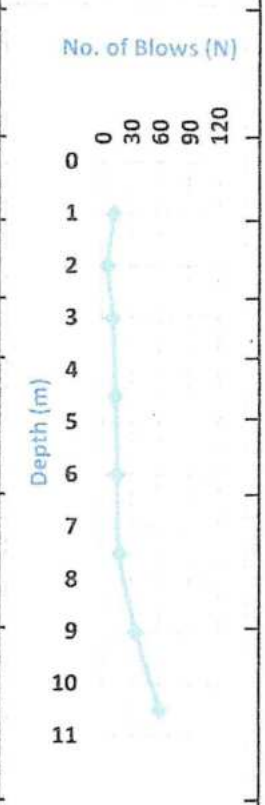
R. Thaliyel

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 7

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	3	5	7	12	Inorganic Soil, Non Plastic Poorly Graded Sand	
1.0-3.0	SC		2	3	3	3	6	Inorganic Soil, Iontermediate Compressible Clayey Sand	
			3	4	5	6	11		
3.0-7.5	SM		4.5	4	6	8	14	Inorganic Soil, Non Plastic Silty Sand	
			6	6	8	8	16		
			7.5	8	8	10	18		
7.5-9.0	CI		9	10	16	19	35	Inorganic Soil, Intermediate Compressible Clay	
9.0-10.5	SC		10.5	14	22	39	61	Inorganic Soil, Iontermediate Compressible Clayey Sand	
Borehole - 7 Terminated at 10.5 m									



*N - Recorded N Value

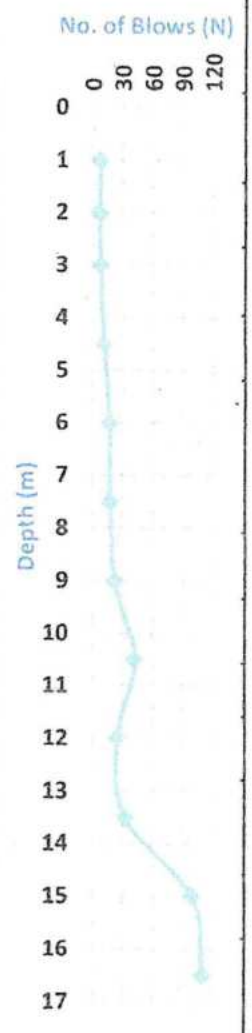
R. Thadiveyl

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 8

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023	
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**				**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP-SM		1	3	4	4	8	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
1.0-3.0	SC		2	3	3	4	7	Inorganic Soil, Intermediate Compressible Clayey Sand
			3	4	4	4	8	
3.0-6.0	SM		4.5	5	6	6	12	Inorganic Soil, Non Plastic Silty Sand
			6	6	8	9	17	
6.0-7.5	SC		7.5	6	9	9	18	Inorganic Soil, Intermediate Compressible Clayey Sand
7.5-10.5	CI		9	8	10	12	22	Inorganic Soil, Intermediate Compressible Clay
			10.5	10	16	27	43	
10.5-13.5	SM		12	10	12	13	25	Inorganic Soil, Non Plastic Silty Sand
			13.5	12	14	19	33	
13.5-15.0	SC		15	16	30	52	82	Inorganic Soil, Intermediate Compressible Clayey Sand
15.0-16.5	SDR		16.50	>100/15 cm Balance			>100	Soft Disintegrated Rock
Borehole - 8 Terminated at 16.5 m								



*N - Recorded N Value

R. Thalavai

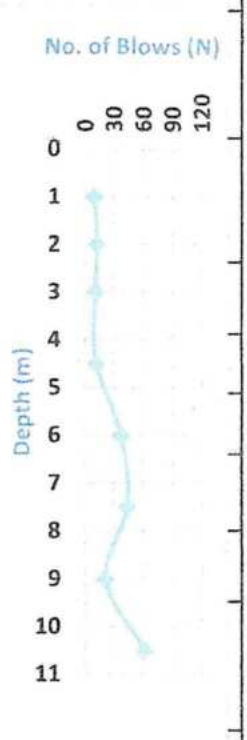
For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 9

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023						**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP-SM		1	3	4	6	10	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
1.0-2.0	SP		2	4	6	7	13	Inorganic Soil, Non Plastic Poorly Graded Sand
2.0-9.0	SM		3	3	5	6	11	Inorganic Soil, Non Plastic Silty Sand
			4.5	4	5	7	12	
			6	10	18	20	38	
			7.5	12	20	24	44	
			9	6	10	11	21	
9.0-10.5	CI		10.5	15	30	32	62	Inorganic Soil, Intermediate Compressible Clay

Graphical Representation of Penetration Resistance



Borehole - 9 Terminated at 10.5 m

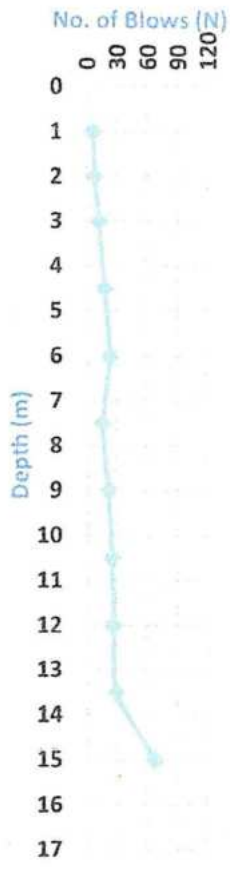
*N - Recorded N Value

R. Thangavel

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 10									
Project		Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:		Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	3	3	4	7	Inorganic Soil, Non Plastic Poorly Graded Sand	
1.0-7.5	SM		2	3	4	4	8	Inorganic Soil, Non Plastic Silty Sand	
			3	4	5	7	12		
			4.5	7	8	10	18		
			6	8	10	13	23		
			7.5	8	8	8	16		
7.5-9.0	SC		9	8	10	12	22	Inorganic Soil, Intermediate Compressible Clayey Sand	
9.0-15.0	CI		10.5	9	12	13	25	Inorganic Soil, Intermediate Compressible Clay	
			12	10	13	14	27		
			13.5	11	14	16	30		
			15	21	30	38	68		
Borehole - 10 Terminated at 15.0 m									



*N - Recorded N Value

R. Thelivel

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 11									
Project		Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:		Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	3	4	6	10	Inorganic Soil, Non Plastic Poorly Graded Sand	
1.0-2.0	SM		2	3	3	3	6	Inorganic Soil, Non Plastic Silty Sand	
2.0-3.0	SC		3	3	3	5	8	Inorganic Soil, Intermediate Compressible Clayey Sand	
3.0-6.0	SM		4.5	3	5	7	12	Inorganic Soil, Non Plastic Silty Sand	
			6	4	6	8	14		
6.0-9.0	SC		7.5	11	18	23	41	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	7	8	11	19		
9.0-10.5	SM		10.5	9	12	12	24	Inorganic Soil, Non Plastic Silty Sand	
10.5-12.0	CI		12	10	13	16	29	Inorganic Soil, Intermediate Compressible Clay	
12.0-15.0	SDR		13.5	>100/10 cm Balance			>100	Soft Disintegrated Rock	
			15	>100/15 cm Balance			>100		
Borehole - 11 Terminated at 15.0 m									



*N - Recorded N Value

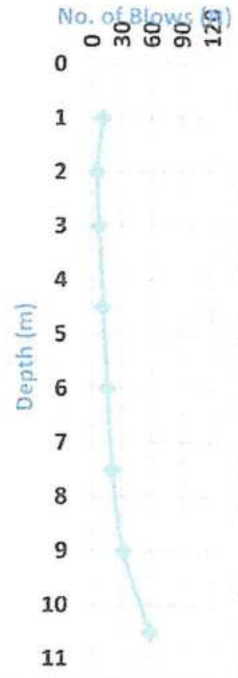
R Thulasiraj

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 12

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	3	5	7	12	Inorganic Soil, Non Plastic Poorly Graded Sand	
1.0-3.0	SC		2	2	3	3	6	Inorganic Soil, Intermediate Compressible Clayey Sand	
			3	3	4	4	8		
3.0-6.0	SM		4.5	4	5	7	12	Inorganic Soil, Non Plastic Silty Sand	
			6	6	8	8	16		
6.0-9.0	SC		7.5	7	9	12	21	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	9	13	19	32		
9.0-10.5	SM		10.5	17	26	33	59	Inorganic Soil, Non Plastic Silty Sand	
Borehole - 12 Terminated at 10.5 m									



*N - Recorded N Value

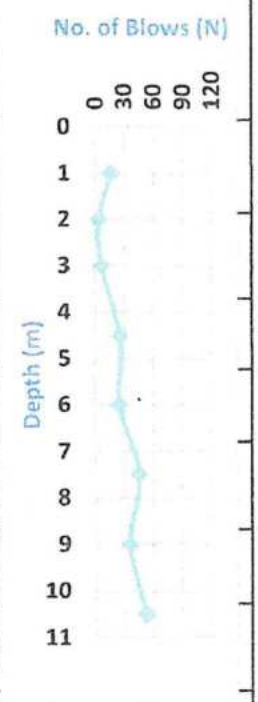
R. Thiruvel

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 13

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm				**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	6	8	9	17	Inorganic Soil, Non Plastic Poorly Graded Sand	
3.0	SC		2	2	2	2	4	Inorganic Soil, Intermediate Compressible Clayey Sand	
			3	2	3	4	7		
3.0-6.0	SM		4.5	7	11	15	26	Inorganic Soil, Non Plastic Silty Sand	
			6	11	11	14	25		
6.0-10.5	SC		7.5	10	20	26	46	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	10	16	20	36		
			10.5	17	25	28	53		
Borehole - 13 Terminated at 10.5 m									



*N - Recorded N Value

R. Thulasi

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 14

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm				**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	6	7	8	15	Inorganic Soil, Non Plastic Poorly Graded Sand	
.0	SM		2	2	4	5	9	Inorganic Soil, Non Plastic Silty Sand	
			3	4	5	5	10		
			4.5	7	11	14	25		
			6	10	13	15	28		
6.0-7.5	SC		7.5	8	10	12	22	Inorganic Soil, Intermediate Compressible Clayey Sand	
7.5-9.0	CI		9	9	14	15	29	Inorganic Soil, Intermediate Compressible Clay	
9.0-10.5	SC		10.5	18	26	30	56	Inorganic Soil, Intermediate Compressible Clayey Sand	
Borehole - 14 Terminated at 10.5 m									



*N - Recorded N Value

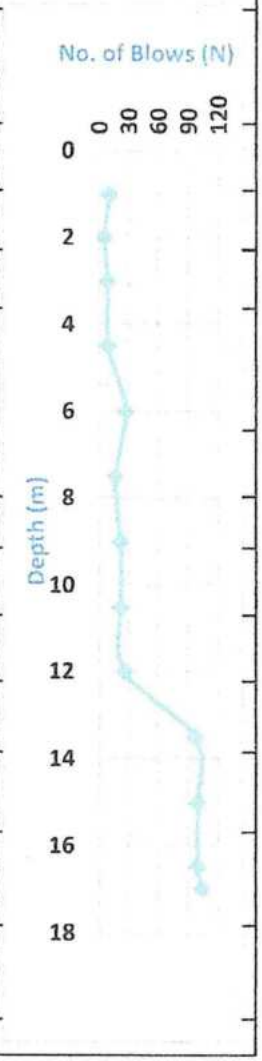
R. Thanavel

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 15

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling				**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023							**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP-SM		1	3	4	7	11	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	
1.0-4.5	SM		2	3	3	3	6	Inorganic Soil, Non Plastic Silty Sand	
			3	3	4	5	9		
			4.5	4	4	6	10		
4.5-6.0	SP		6	8	10	17	27	Inorganic Soil, Non Plastic Poorly Graded Sand	
6.0-10.5	SC		7.5	8	8	9	17	Inorganic Soil, Intermediate Compressible Clayey Sand	
			9	9	10	12	22		
			10.5	10	10	12	22		
10.5-13.5	CI		12	12	12	14	26	Inorganic Soil, Intermediate Compressible Clay	
			13.5	18	29	69	98		
13.5-17.0	SDR		15	>100/15 cm Balance			>100	Soft Disintegrated Rock	
			16.50	>100/15 cm Balance			>100		
			17.00	>100/15 cm Balance			>100		
Borehole - 15 Terminated at 17.0 m									



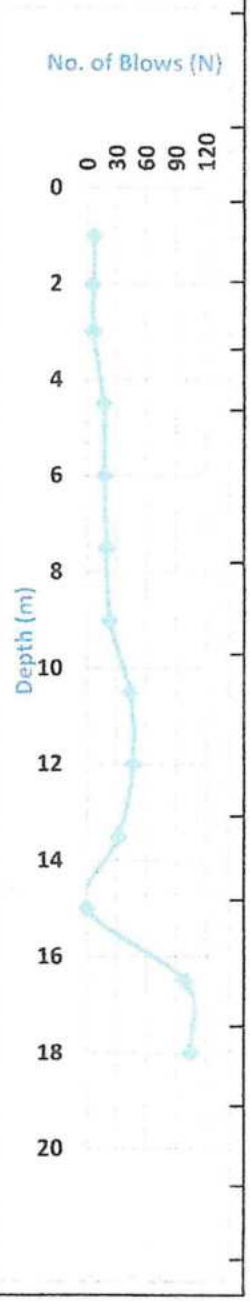
*N - Recorded N Value

For GT Bharathi Urban Developers Pvt Ltd

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BORE LOG 16

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023						**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP-SM		1	3	3	5	8	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
1.0-3.0	SC		2	2	3	4	7	Inorganic Soil, Intermediate Compressible Clayey Sand
			3	3	3	4	7	
3.0-6.0	SM		4.5	7	8	9	17	Inorganic Soil, Non Plastic Silty Sand
			6	8	8	10	18	
6.0-7.5	SC		7.5	7	9	11	20	Inorganic Soil, Intermediate Compressible Clayey Sand
7.5-9.0	SM		9	8	10	13	23	Inorganic Soil, Non Plastic Silty Sand
9.0-10.5	SC		10.5	10	16	28	44	Inorganic Soil, Intermediate Compressible Clayey Sand
10.5-12.0	SM		12	9	18	29	47	Inorganic Soil, Non Plastic Silty Sand
12.0-15.0	Cl		13.5	10	15	17	32	Inorganic Soil, Intermediate Compressible Clay
15.0-18.0	SDR		15	>100/15 cm Balance			0	Soft Disintegrated Rock
			16.50	>100/15 cm Balance			>100	
			18.00	>100/25 cm Balance			>100	
Borehole - 16 Terminated at 18.0 m								



*N - Recorded N Value

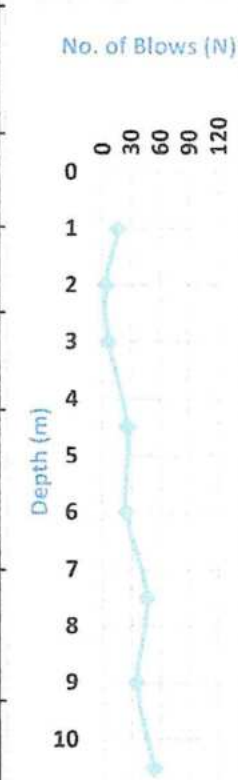
For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 17

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.							
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm			**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023						**Date of Completion:** 24/04/2023		
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**
			Depth (m)	15cm	15cm	15cm	*N value	
0-1.0	SP-SM		1	6	8	9	17	Inorganic Soil, Non Plastic Poorly Graded Silty Sand
1.0-3.0	SC		2	2	2	2	4	Inorganic Soil, Intermediate Compressible Clayey Sand
			3	2	3	4	7	
3.0-4.5	SM		4.5	7	11	15	26	Inorganic Soil, Non Plastic Silty Sand
4.5-7.5	SC		6	11	11	14	25	Inorganic Soil, Intermediate Compressible Clayey Sand
			7.5	10	20	26	46	
7.5-9.0	CI		9	10	16			ganic Soil, ermediate ressible Clay
9.0-10.5	SC		10.5	17	25	28	53	ganic Soil, Intermediate Compressible Clayey Sand
Borehole - 17 Terminated at 10.5 m								

Graphical Representation of Penetration Resistance



*N - Recorded N Value

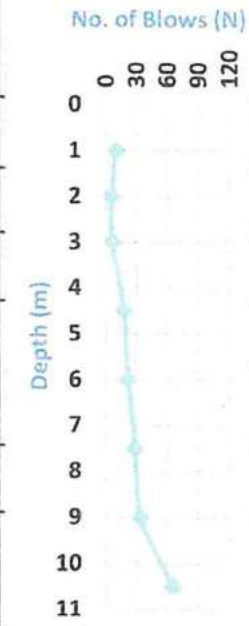
R. Thakur

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

BORE LOG 18

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.								
Drilling method:	Rotary drilling			**Dia of bore:** 150 mm				**GWT:** - 5.0 m	
Date of Commencement: 19/04/2023								**Date of Completion:** 24/04/2023	
Strata Depth (m)	**Soil Type**	**Soil Profile**	**Standard Penetration Test Result**					**Description of Soil stratum**	**Graphical Representation of Penetration Resistance**
			Depth (m)	15cm	15cm	15cm	*N value		
0-1.0	SP		1	4	5	6	11	Inorganic Soil, Non Plastic Poorly Graded Sand	
9.0	SC		2	2	3	3	6	Inorganic Soil, Intermediate Compressible Clayey Sand	
			3	3	3	4	7		
			4.5	5	7	11	18		
			6	6	9	13	22		
			7.5	10	12	17	29		
			9	12	14	21	35		
9.0-10.5	CI		10.5	16	27	39	66	Inorganic Soil, Intermediate Compressible Clay	
Borehole - 18 Terminated at 10.5 m									



*N - Recorded N Value

R. Thiruvel

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
1	0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	6	64	30	*NP			-	11
				0	5	63	31	*NP				15
				1	10	62	27	*NP				16
				1	13	59	27	*NP				15
				8	19	53	20	*NP				14
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	2	4	52	43	36	20	16	11	14
				9	8	35	36	42	15	27	10	14
	9.0-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	5	7	34	53	45	20	25	28	17
	10.5-12.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	2	6	61	31	36	14	22	10	18
	12.0-13.5	SM	Inorganic Soil, Non Plastic Silty Sand	10	11	40	39	*NP			-	16
	13.5-15.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	4	9	48	38	38	18	20	9	18
	15.0-16.5	SDR	Soft Disintegrated Rock	Washing Sample								

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
2	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	8	88	4	*NP			-	16
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	7	65	29	39	15	24	16	16
				1	11	60	28	41	14	27	18	15
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	10	24	49	15	*NP			-	15
				8	19	48	19	*NP			-	13
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	4	7	47	33	44	15	29	17	19
				13	7	46	33	36	20	16	14	15
	9.0-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	6	12	31	52	36	22	14	27	21
	10.5-15.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	3	3	52	42	37	24	13	15	20
				4	4	52	40	39	16	23	14	19
				4	8	48	39	40	17	23	15	17
	15.0-18.0	SDR	Soft Disintegrated Rock	Washing Sample								
				Washing Sample								

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Ghatsrey

SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.												
Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
3	0-1.0	SP-SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	6	85	8	*NP			- -	15
	1.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	6	67	27	*NP				18
				0	8	63	29	*NP				16
				7	20	58	16	*NP				17
				7	19	57	18	*NP				14
	6.0-7.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	9	9	44	34	38	15	23	10	18
	7.5-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	6	9	30	53	42	15	27	29	18
				1	3	45	51	40	9	31	31	19

*NP- Non Plastic

R. Thoraiyal

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
4	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	3	92	5	*NP			-	17
	1.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	5	77	18	*NP			-	18
				0	4	69	26	*NP			-	19
				2	15	64	17	*NP			-	15
				4	15	62	19	*NP			-	14
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	23	10	31	34	39	19	20	16	14
				13	8	43	35	42	14	28	14	15
	9.0-12.0	CI	Inorganic Soil, Intermediate Compressible Clay	6	10	35	50	40	18	22	27	21
				1	1	36	62	38	11	27	26	22
	12.0-13.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	8	13	35	45	37	18	19	14	23
	13.5-15.0	SM	Inorganic Soil, Non Plastic Silty Sand	7	21	53	19	*NP			-	13
	15.0-18.0	SDR	Soft Disintegrated Rock	Washing Sample								
				Washing Sample								

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

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R. Thaiva

SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.												
Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
5	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	8	87	5	*NP			-	17
	1.0-6.0	SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	5	81	13	*NP				16
				0	6	70	23	*NP				15
				7	20	58	13	*NP				14
				8	3	49	32	*NP				13
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	10	8	46	32	38	14	24	10	19
				3	4	45	47	37	10	27	11	17
	9.0-10.5	SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	1	5	70	23	*NP			-	19
	10.5-12.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	2	3	53	42	36	8	28	8	21
	12.0-13.5	SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	12	12	46	25	*NP			-	12
	13.5-15.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	11	8	44	36	44	21	23	9	19
	15.0-16.5	SDR	Sodt Disintegrated Rock	Washing Sample								

*NP- Non Plastic

R. Thatiyer

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.											
Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
6	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	8	87	5	*NP			-	16
	1.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	5	66	29	*NP				16
				0	7	65	28	*NP				15
				8	18	55	19	*NP				13
				8	23	49	20	*NP				14
	6.0-9.0	SC	Inorganic Soil, Iontermediate Compressible Clayey Sand	2	4	54	40	38	16	22	8	8
				6	7	55	32	42	18	24	11	14
	9.0-10.5	SM	Inorganic Soil, Non Plastic Silty Sand	9	30	42	20	*NP			-	16

*NP- Non Plastic

R. Thanavel

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.												
Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
7	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	7	88	5	*NP			-	16
	1.0-3.0	SC	Inorganic Soil, Iontermediate Compressible Clayey Sand	0	6	64	30	41	13	28	8	16
				0	7	63	30	42	14	28	11	15
	3.0-7.5	SM	Inorganic Soil, Non Plastic Silty Sand	11	21	49	17	*NP			-	16
				6	20	57	18	*NP			-	15
				21	17	40	22	*NP			-	13
	7.5-9.0	CI	Inorganic Soil, Intermediate Compressible Clay	7	11	29	53	39	17	22	23	17
	9.0-10.5	SC	Inorganic Soil, Iontermediate Compressible Clayey Sand	7	13	33	46	44	16	28	10	17

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

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R. Thiruvel 10

SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
	0-1.0	SP-SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	10	81	8	*NP			-	20
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	7	65	27	36	12	24	8	16
				0	7	66	26	38	13	25	7	15
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	8	21	56	14	*NP			-	16
				6	17	53	20	*NP			-	18
	6.0-7.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	8	8	42	41	41	20	21	10	18
	7.5-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	2	4	39	54	42	20	22	21	20
				5	11	31	54	46	19	27	20	16
	10.5-13.5	SM	Inorganic Soil, Non Plastic Silty Sand	6	8	53	32	*NP			-	19
				6	10	65	18	*NP			-	18
	13.5-15.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	8	8	44	36	39	19	20	9	14
	15.0-16.5	SDR	Soft Disintegrated Rock	Washing Sample								

*NP- Non Plastic

R. Thanjiyan

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
9	0-1.0	SP-SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	4	89	7	*NP			-	18
	1.0-2.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	3	93	4	*NP				19
	2.0-9.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	9	63	28	*NP				16
				2	11	60	26	*NP				14
				7	19	44	30	*NP				11
				2	13	55	30	*NP				12
				4	4	57	34	*NP				16
	9.0-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	3	3	22	71	40	18	22	20	19

*NP- Non Plastic

R. Thanavel

For GT Bharathi Urban Developers Pvt Ltd

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CIVIL TESTING LAB PRIVATE LIMITED CHENNAI 600 097

SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
10	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	1	6	88	5	*NP			-	18
	1.0-7.5	SM	Inorganic Soil, Non Plastic Silty Sand	0	6	66	28	*NP				5
				0	6	66	28	*NP				27
				8	20	55	16	*NP				15
				9	21	53	15	*NP				13
				10	8	40	41	*NP				20
	7.5-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	7	11	50	31	39	16	23	9	18
	9.0-15.0	CI	Inorganic Soil, Intermediate Compressible Clay	1	2	27	71	45	15	30	29	30
				2	3	30	66	44	16	28	30	30
				1	4	28	67	48	14	34	28	29
				3	3	41	53	45	17	28	31	21

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

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R. Thatiya

SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
11	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	1	5	89	5	*NP			-	15
	1.0-2.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	5	69	25	*NP			-	16
	2.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	7	65	28	39	12	27	9	14
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	3	17	59	21	*NP			-	15
				7	20	54	19	*NP			-	10
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	21	14	40	26	41	16	25	11	23
				3	3	59	35	36	18	18	10	18
	9.0-10.5	SM	Inorganic Soil, Non Plastic Silty Sand	1	1	49	49	*NP			-	19
	10.5-12.0	CI	Inorganic Soil, Intermediate Compressible Clay	1	1	46	51	43	17	26	21	18
	12.0-15.0	SDR	Soft Disintegrated Rock	Washing Sample								
				Washing Sample								

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Thadney

SUMMARY OF LABORATORY TEST RESULTS

Project Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
12	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	1	9	85	4	*NP			-	16
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	6	63	30	39	14	25	8	15
				0	6	65	29	41	11	30	7	13
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	3	11	59	26	*NP			-	14
				6	16	48	30	*NP			-	14
	6.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	7	7	51	34	40	18	22	10	16
				5	6	46	43	38	19	19	11	15
	9.0-10.5	SM	Inorganic Soil, Non Plastic Silty Sand	3	5	66	26	*NP			-	16

*NP- Non Plastic

R. Thanigai

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
13	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	5	91	4	*NP			-	16
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	6	65	29	38	14	24	16	15
				0	8	66	27	41	13	28	17	14
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	7	16	56	21	*NP			-	13
				3	13	55	28	*NP			-	13
	6.0-10.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	6	11	52	31	40	14	26	17	9
				7	5	38	46	37	12	25	15	19
				14	16	43	26	39	14	25	16	9

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Thulasi

SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
14	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	0	7	89	4	*NP			-	17
	1.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	0	10	61	29	*NP				15
				1	12	61	27	*NP				14
				13	24	41	21	*NP				12
				13	25	42	19	*NP				14
	6.0-7.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	5	5	39	47	39	19	20	11	8
	7.5-9.0	CI	Inorganic Soil, Intermediate Compressible Clay	5	4	25	65	41	22	19	22	21
	9.0-10.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	8	13	44	35	40	11	29	9	14

*NP- Non Plastic

R. Thadiyel

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project: Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
16	0-1.0	SP-SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	10	83	6	*NP			-	15
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	1	6	64	30	38	16	22	16	17
				0	6	63	31	41	16	25	15.	16
	3.0-6.0	SM	Inorganic Soil, Non Plastic Silty Sand	7	20	56	15	*NP			-	16
				9	24	48	19	*NP			-	14
	6.0-7.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	9	7	45	36	40	18	22	14	19
	7.5-9.0	SM	Inorganic Soil, Non Plastic Silty Sand	20	11	42	26	*NP			-	17
	9.0-10.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	2	4	58	37	44	14	30	14	20
	10.5-12.0	SM	Inorganic Soil, Non Plastic Silty Sand	1	19	51	29	*NP			-	30
	12.0-15.0	CI	Inorganic Soil, Intermediate Compressible Clay	4	7	33	54	37	17	20	27	24
	15.0-18.0	SDR	Soft Disintegrated Rock	Washing Sample								
				Washing Sample								
				Washing Sample								

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory

R. Thulive

SUMMARY OF LABORATORY TEST RESULTS

Project	Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.												
Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis/CR/RQD -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI		
17	0-1.0	SP-SM	Inorganic Soil, Non Plastic Poorly Graded Silty Sand	0	6	88	6	*NP			-	17
	1.0-3.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	0	5	66	29	41	13	28	9	17
				0	7	63	30	39	12	27	11	16
	3.0-4.5	SM	Inorganic Soil, Non Plastic Silty Sand	5	15	56	24	*NP			-	14
	4.5-7.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	6	16	55	22	40	13	27	10	13
				4	3	54	39	38	19	19	8	18
	7.5-9.0	CI	Inorganic Soil, Intermediate Compressible Clay	5	5	35	55	37	19	18	19	23
	9.0-10.5	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	2	7	48	43	39	16	23	11	16

*NP- Non Plastic

For GT Bharathi Urban Developers Pvt Ltd

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SUMMARY OF LABORATORY TEST RESULTS

Project Proposed Construction of Residential Building, Villa Stilt+2 Floors, Apartments G+4 Floors at Vadanemeli, ECR, Chennai, Tamilnadu.

Bore Hole No.	Depth (m)	Unified Soil Classification	Strata Descriptions	Grain size analysis -in %				Atterberg Limits (%)			Swell Index (%)	Natural Moisture Content (%)
				Coarse Sand	Medium Sand	Fine Sand	Silt & Clay	LL	PL	PI'		
18	0-1.0	SP	Inorganic Soil, Non Plastic Poorly Graded Sand	1	11	86	1	*NP			-	11
	1.0-9.0	SC	Inorganic Soil, Intermediate Compressible Clayey Sand	1	4	56	22	38	13	25	8	15
				0	8	63	30	39	12	27	9	14
				1	8	61	29	41	13	28	8	14
				7	18	47	23	43	15	28	11	12
				22	12	40	23	40	16	24	10	14
				18	10	30	22	38	16	22	8	12
	9.0-10.5	CI	Inorganic Soil, Intermediate Compressible Clay	2	2	30	65	41	22	19	23	22

*NP- Non Plastic

R. Thanivel

For GT Bharathi Urban Developers Pvt Ltd

Authorized Signatory



our services doesn't just end there

Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.

Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

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

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

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