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GEOTECHNICAL SITE INVESTIGATION REPORT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING IN MYLAPORE

Report Submitted to

M/s. Herald Constructions Private Limited
NO: 54/9,
South Sivan Koil Street,
Kodambakkam,
Chennai - 600024.

Site Address

Door No.10/31,
Srinivasa Rao Road,
Mylapore,
Chennai-600004.



DYNAMIQ ENGINEERING RESEARCH CENTRE
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Date : 31/03/2023

Place : AVADI

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Verified and approved by

PROJECT DETAILS

Company	DYNAMIQ ENGINEERING RESEARCH CENTRE, AVADI.	**SHEET**	**CLASS RESTRICTED**
Project Title	Geotechnical Site Investigation Report for Proposed Construction of Residential Building in Mylapore.		
Report Title	Geotechnical Site Investigation Report for Proposed Construction of Residential Building in Mylapore.	Report No. 657	
Project Team (Authors)	Er. A. Jagathan Prakaash, & Er. A. Ramesh		
Area	Geotechnical Investigation		
Name and Address of the Client	M/s. Herald Constructions Private Limited NO: 54/9, South Sivan Koil Street, Kodambakkam, Chennai - 600024.	Date of submission 31/03/2023	

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GEOTECHNICAL SITE INVESTIGATION REPORT FOR PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING IN MYLAPORE

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1.0 Introduction:

Geotechnical Site Investigation Report for Proposed Construction of Residential Building in Mylapore. 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.

2.0 Scope of the exploration:

Conducting Preliminary Geo Technical Investigation by doing bore holes at three locations up to depth of Required Hard Stratum and assessing bearing capacity and allowable bearing pressure based on the field test carried out in the stratum encountered. The type and depth of foundation for the proposed foundation has to be recommended.

3.0 Method of exploration:

Calyx rotary drilling with auger of dia.100mm dia has been used for making bore holes duly circulating bentonite slurry. In this method, the advancement of boring is made by the cutting action of a rotating bit that is kept in firm contact with the bottom of the hole. The bit is attached to the lower end of hollow drill rod, which is rotated by a suitable chuck. Drilling mud, (viz) bentonite is continuously forced down the hollow drill rods. The mud returning upward through the annular space between the drill rods and side of the hole brings the soil particles to the surface. The soil exploration consists of three stages i.e., boring, sampling and testing which includes both field and lab tests. The Samples were collected at every 1.5m or 2m intervel depth of the bore hole. Samples were properly labeled for Lab tests. Bore log particulars and location of bore holes are annexed with this report.



4.0 Depth of Exploration:

Exploration should be carried to a depth at which the net increase in vertical stress is less than the allowable bearing pressure of the soil. The exploration was proposed to be carried out to a depth of Required Hard Stratum.

5.0 Ground water level:

Observation of location of water table and its fluctuation under different seasons is very important. The location of ground water level is also important for deep excavation and foundation works and also on sites susceptible to be water logged. Open wells at the site or in the vicinity of the site can give a clear idea of water table and its fluctuation. Boreholes can also be used for recording water levels.

6.0 Field Tests:

Penetration and sounding tests are the generally adopted field Tests. Standard Penetration Test is performed as per I.S. 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 bedrock 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 U.D.S.

In the field test the Standard Penetration Test sampler is driven by the free fall of a hammer weighing 63.5kg dropped from a height of 76cm.The sampler is initially driven through 15cm as a seating drive. It is further driven through 30cm. The number of blows required to drive the sampler 30cm below the seating drive is termed the penetration resistance 'N'.

7.0 Laboratory Tests:

The samples collected at the field were subjected to laboratory tests to determine the Natural Moisture Content, Particle size analysis and Specific Gravity etc. The test results are tabulated and annexed to this report.



8.0 Field & Laboratory observations:

The proposed site is situated in the developing area. Three bore holes are drilled to confirm the general stratum of the area. The sub-soil stratum at the location of bore holes are Silty Sand and Silty Sandy Clay up to the depth of termination of bore hole. Boreholes were terminated at the depth of 21m & 10m for BH1 & BH2, BH3 respectively.

9.0 Water table fluctuations:

At the time of soil investigation ground water table was met at 3.0m depth of the bore hole operations.

10.0 Conclusion and Recommendations:-

Open Foundation:-

- After Critical review of the results, Open Foundation in the form of Isolated Footing is recommended for the Proposed Structures.
- The depth of foundation shall be placed at **2.0m** from the Existing Ground Level.
- The Safe Bearing capacity (SBC) **16t/m^2** can be taken of soil at **2.0m** below Existing Ground Level.
- All the foundation should rest on minimum 150mm thick 1:4:8 concrete mat, over 100mm thick river sand / M-Sand layer.
- Settlements are within permissible limits as per IS-1904-1986.

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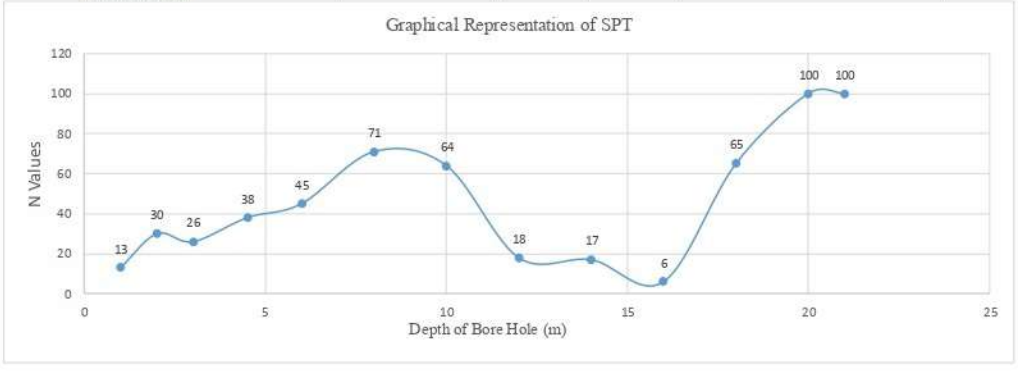
APPENDIX – A
BOREHOLE LOG



SOIL PROFILE AT BH-1 LOCATION

Type of Boring	: Rotary	**Location**	: Mylapore.
Started on	: 23/03/2023	**Dia of Boring**	: 100mm
Ended on	: 24/03/2023	**Total Depth**	: 21m.

DEPTH BELOW G.L (R.L)	SOIL PROFILES	STRATA DESCRIPTION	Relative Density / Consistancy	Sample Type	N - Value - Depth of Penetration				
					DEPTH (m)	15	30	45	N - Value for 30cm
2		Brownish Silty Sandy Clay	Medium Dense	SS	1	4	5	8	13
3		Brownish Gray Silty Sand	Dense	SS	2	15	15	15	30
12		Brown Sand	Medium Dense	SS	3	5	7	19	26
			Dense	SS	4.5	12	18	20	38
			Dense	SS	6	15	20	25	45
			Very Dense	SS	8	26	33	38	71
			Very Dense	SS	10	25	29	35	64
13.6		Gray Silty Sand	Medium Dense	SS	12	6	8	10	18
18		Gray Silty Sandy Clay	Medium Dense	SS	14	6	6	11	17
			Loose	SS	16	2	2	4	6
19.5		Greenish White Sandy Clay	Very Dense	SS	18	30	30	35	65
21		Yellowish Brown Murrum Soil	Very Dense	SS	20	60 Blows for 13cm Penetration (SPT Rebounds)			>100
			Very Dense	WS	21	Drilling Rebounds			>100

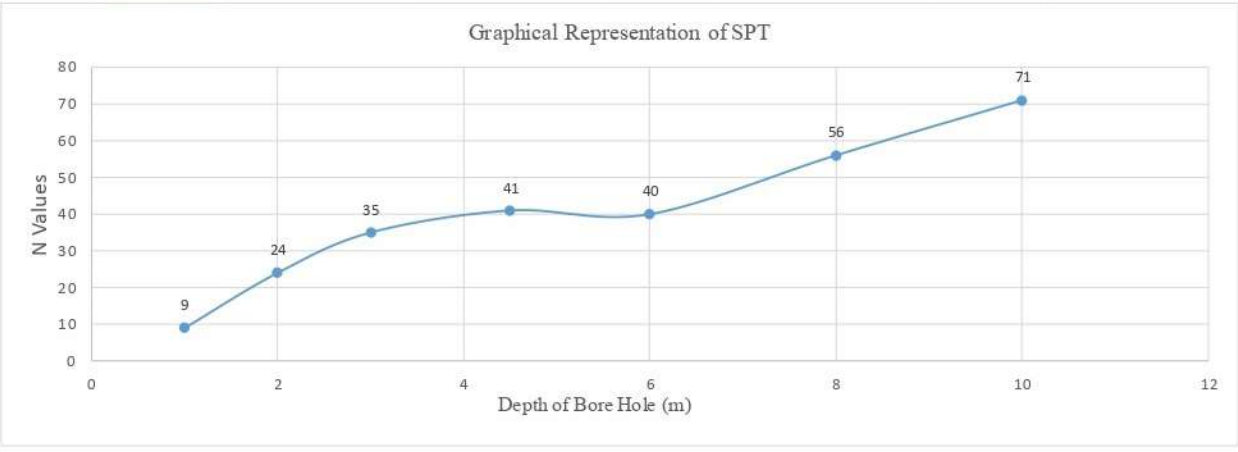


WS - Wasing Sample, **SS** - Split Spoon Sample, **SDR** - Soft Disintegrated Rock, **HR** - Hard Rock

SOIL PROFILE AT BH-2 LOCATION

Type of Boring	: Rotary	**Location**	: Mylapore.
Started on	: 24/03/2023	**Dia of Boring**	: 100mm
Ended on	: 24/03/2023	**Total Depth**	: 10m

DEPTH BELOW G.L (R.L)	SOIL PROFILES	STRATA DESCRIPTION	Relative Density / Consistancy	Sample Type	N - Value - Depth of Penetration				
					DEPTH (m)	15	30	45	N - Value for 30cm
1.8		Brown Silty Sand	Loose	SS	1	5	4	5	9
3		Brown Silty Sandy Clay	Medium Dense	SS	2	10	15	9	24
		Brown Sand	Dense	SS	3	10	15	20	35
			Dense	SS	4.5	11	17	24	41
			Dense	SS	6	10	17	23	40
			Very Dense	SS	8	13	24	32	56
10.45			Very Dense	SS	10	20	34	37	71



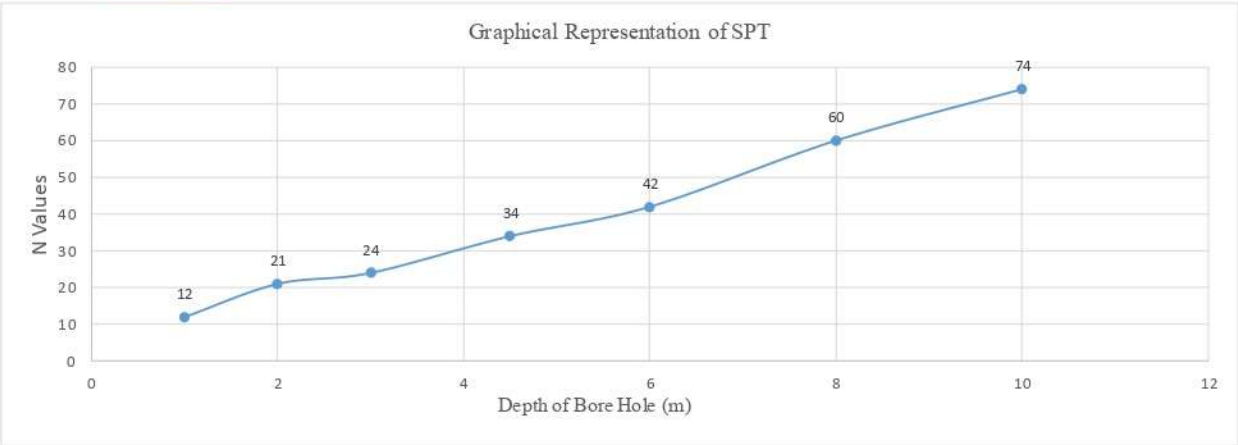
WS - Wasing Sample, **SS** - Split Spoon Sample, **SDR** - Soft Disintegrated Rock, **HR** - Hard Rock

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SOIL PROFILE AT BH-3 LOCATION

Type of Boring	: Rotary	**Location**	: Mylapore.
Started on	: 25/03/2023	**Dia of Boring**	: 100mm
Ended on	: 25/03/2023	**Total Depth**	: 10m

DEPTH BELOW G.L (R.L)	SOIL PROFILES	STRATA DESCRIPTION	Relative Density / Consistancy	Sample Type	N - Value - Depth of Penetration				
					DEPTH (m)	15	30	45	N - Value for 30cm
		Brownish Gray Silty Sandy Clay	Soft	SS	1	4	5	7	12
			Soft	SS	2	7	7	14	21
3.4			Medium Dense	SS	3	6	8	16	24
		Brown Sand	Medium Dense	SS	4.5	10	14	20	34
			Medium Dense	SS	6	12	17	25	42
			Dense	SS	8	15	26	34	60
10.45			Dense	SS	10	19	35	39	74



WS - Wasing Sample, **SS** - Split Spoon Sample, **SDR** - Soft Disintegrated Rock, **HR** - Hard Rock

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APPENDIX – B
LABORATORY TEST RESULTS



Bore Hole No: 1		Laboratory Test Results						Tested By:		Ramesh A			
Date: 28/03/2023								Checked By:		Jagathan Prakaash A			
N-Value	Depth(m)	IS Classification	Grain Size Analysis					Atterberg Limits			NMC %	Specific Gravity	Safe Bearing Capacity (T/m2)
			Gravel %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt & Clay %	Liquid Limit %	Plastic Limit %	Plasticity Index			
13	1	SC	0.00	0.00	15.00	35.83	49.17	42.33	18.76	23.57	15.05	2.50	9.09
30	2	SP	2.25	0.96	59.81	34.08	2.89	NON - PLASTICITY			15.51	2.53	23.46
26	3	SP	4.38	4.38	68.53	20.72	1.99	NON - PLASTICITY			15.29	2.56	22.31
38	4.5	SP	9.30	3.49	70.16	16.28	0.78	NON - PLASTICITY			16.67	2.64	32.41
45	6	SP	0.00	0.00	66.51	32.09	1.40	NON - PLASTICITY			16.07	2.58	38.89
71	8	SP	3.74	6.59	64.62	22.86	2.20	NON - PLASTICITY			14.16	2.54	59.95
64	10	SP	0.00	0.00	58.60	40.13	1.27	NON - PLASTICITY			15.71	2.59	56.61
18	12	SP	0.00	3.26	37.46	47.88	11.40	NON - PLASTICITY			16.33	2.47	24.24
17	14	SC	0.00	0.00	8.33	31.67	60.00	64.34	26.54	37.80	30.43	2.37	25.14
6	16	SC	0.00	0.00	8.33	31.67	60.00	55.00	27.10	27.90	21.79	2.55	18.24
65	18	SC	0.00	0.00	11.67	38.33	50.00	57.88	23.43	34.45	11.85	2.56	63.70
>100	20	SP	14.81	3.70	47.74	31.28	2.47	NON - PLASTICITY			13.60	2.57	69.24
>100	21	SP	0.00	0.00	52.07	45.87	2.07	NON - PLASTICITY			17.14	2.54	71.27

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Bore Hole No: 2		Laboratory Test Results						Tested By:		Ramesh A			
Date: 28/03/2023								Checked By:		Jagathan Prakaash A			
N-Value	Depth(m)	IS Classification	Grain Size Analysis					Atterberg Limits			NMC %	Specific Gravity	Safe Bearing Capacity (T/m2)
			Gravel %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt & Clay %	Liquid Limit %	Plastic Limit %	Plasticity Index			
9	1	SP	17.55	4.79	45.21	25.53	6.91	NON - PLASTICITY			15.98	2.41	6.04
24	2	SC	0.00	0.00	14.17	39.17	46.67	60.43	20.80	39.63	21.10	2.52	18.93
35	3	SW	11.83	5.91	58.06	21.51	2.69	NON - PLASTICITY			15.79	2.41	28.86
41	4.5	SP	0.00	1.02	89.00	9.21	0.77	NON - PLASTICITY			16.88	2.59	34.52
40	6	SP	0.48	0.96	88.73	9.11	0.72	NON - PLASTICITY			17.02	2.60	35.09
56	8	SP	0.00	0.00	59.33	40.00	0.67	NON - PLASTICITY			20.06	2.47	48.76
71	10	SP	0.00	0.00	64.06	35.31	0.63	NON - PLASTICITY			19.14	2.51	61.69



Bore Hole No: 3		Laboratory Test Results									Tested By:	Ramesh A			
Date: 28/03/2023											Checked By:	Jagathan Prakaash A			
N-Value	Depth(m)	IS Classification	Grain Size Analysis					Atterberg Limits			NMC %	Specific Gravity	Safe Bearing Capacity (T/m2)		
			Gravel %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt & Clay %	Liquid Limit %	Plastic Limit %	Plasticity Index					
12	1	SC	0.00	0.00	12.34	34.09	53.57	53.44	21.87	31.57	15.49	2.55	8.35		
21	2	SC	0.00	0.00	13.33	39.17	47.50	60.43	20.80	39.63	15.89	2.50	16.81		
24	3	SC	0.00	0.00	15.00	26.67	58.33	52.34	23.00	29.34	17.67	2.60	20.83		
34	4.5	SP	0.00	0.00	68.42	30.08	1.50	NON - PLASTICITY			17.34	2.37	29.45		
42	6	SP	0.00	0.00	66.67	31.54	1.79	NON - PLASTICITY			19.72	2.51	36.67		
60	8	SP	0.00	0.00	40.31	58.91	0.78	NON - PLASTICITY			18.94	2.58	51.81		
74	10	SP	0.00	0.00	52.21	47.06	0.74	NON - PLASTICITY			20.36	2.53	64.00		

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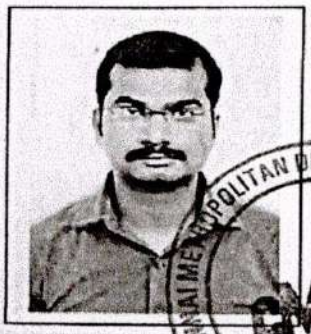
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'ThalamuthuNatarajan Building', No.1, Gandhi Irwin Road,
Egmore, Chennai-600 008.

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the **Thiru M. AMMAIAPPAN** has enrolled as **Registered Geo-Technical Engineer (RGTE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.E.,(Geo Technical Engg.)** and experience in the relevant field for **07 years**.

He has been given the Registration No.**GTE/2020/08/046** on **29.08.2020.** He shall be required to comply with the duties and responsibilities prescribed by the Government of Tamil Nadu in Part-V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MAWS (MA1) Dept. dated 04.02.2019.

This Registration is valid upto **28.08.2025.**



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25/09/2020

(R.SHIVAKUMAR)

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