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# PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (1BASEMENT+STILT+11 UPPER FLOORS) AT PADAPPAI.

## Report on Geotechnical Investigation

### Client:

M/s. Ruby Builders & Promoters,  
Chennai

| REPORT ISSUE STATUS |            |              |                                                                                                            |
|---------------------|------------|--------------|------------------------------------------------------------------------------------------------------------|
| <2>                 | 10-05-2023 | Revision-2   | The proposed structure is changed from residential building (Stilt+5) to (1Basement+Stilt+11Upper floors). |
| <1>                 | 11-03-2023 | Revision-1   | Changed the proposed structure of residential building (1 Basement+Stilt +14floors) to (Stilt + 5).        |
| <0>                 | 02-03-2023 | Final Report | -                                                                                                          |
| Issue               | Date       | Description  | Updation                                                                                                   |



### <sup>®</sup> MARS SYNERGY GEOTECH Pvt Ltd

An ISO 9001: 2015 Certified Company  
NABL Accredited Laboratory

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NABL: ULR-TC867823100000048F

Project No: MSGTPL/SI-5751-R2/22-23

Mar-2023

To

M/s. Ruby Builders & Promoters,  
Chennai.

10<sup>th</sup> May 2023

**Reg:** The proposed construction of residential building (1Basement+Stilt+11 Upper Floors) at  
No. 387/1A1A1, 388, 389/2, 390/1B, Padappai Village, Kundrathur Taluk, Kancheepuram  
District, Tamil Nadu, INDIA.

The **Mars Synergy Geotech Pvt Ltd**, Chennai has completed the geotechnical engineering  
services for the above referred project.

This geotechnical engineering report presents the results of the subsurface exploration and the  
recommendations for your proposed structures foundation are presented here in final form  
together with a summary of field and laboratory data.

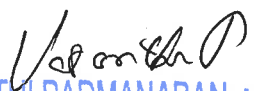
We appreciate the opportunity to be of service to you on this project. If you have any comments  
concerning this report, or if we may be of further services, please contact us/mail.

**Note:**

1. The test results enclosed are only related to the sample tested by us.
2. The Report shall not be reproduced in full or part without written permission from Mars Synergy Geotech Laboratory.
3. All the lab related tested values are as per the standard conditions followed by the lab.
4. Samples are retained for 30 days from sample received date at lab.

Sincerely,

**Mars Synergy Geotech Pvt Ltd.**

  
**VASANTHI PADMANABAN, M.Tech.,**  
Registered Geotechnical Engineer  
Reg. No: CGLRGN/RGTE/2019/08/011

**ULR-TC867823100000048F**

Report No: **MSGTPL/SI-5751-R2/22-23**

Copies Submitted: (2)

Total no of Pages: (27)

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**REPORT ON SUBSOIL INVESTIGATION AND RECOMMENDATIONS FOR THE**  
**PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING**  
**(1 BASEMENT+STILT+11 UPPER FLOORS) AT PADAPPAL, CHENNAI.**

**1.0 INTRODUCTION**

**M/s. Ruby Builders & Promoters** Chennai are planning to construct residential building (1Basement+stilt+11upper floors) at No. 387/1A1A1, 388, 389/2, 390/1B, Padappai Village, Kundrathur Taluk, Kancheepuram District, Chennai, Tamil Nadu, INDIA. **M/s. Mars Synergy Geotech Pvt Ltd, Chennai**, carried out this investigation and completed on 20<sup>th</sup> Feb 2023 as per client instructions.

**The scope of work includes the following**

- Making five numbers of Standard Soil Investigation bore-holes
- Collecting soil samples at regular depth intervals
- Conducting SPTs at every 1.0m/1.50m depth intervals
- Conducting laboratory tests on samples collected
- Submitting report with laboratory test results and recommendations for foundations.

**1.1 DESCRIPTION OF STRUCTURE**

The proposed structure is a residential tower

- (i) Residential tower with (1 Basement + stilt + 11 upper floors)

The exact details of columns are not available at the time of preparation of this report.

The residential building size is assumed 30m x 60.0m

Assuming an approximate column spacing of 4 to 5m c/c considering this the central column load works about 350 to 400 Tones for proposed building. These loads are assumed for foundation only and for the structural design, exact loads are to be estimated based on a suitable structural analysis

**1.2 SOIL INVESTIGATION**

The field investigation works were carried out using 1 set of Rotary mechanical drilling Rig. The following activities, carried out in chronological sequence, comprised the field work for the project

- Mobilisation of rotary drill rig, water pump, testing tools and accessories.
- Collection of disturbed samples of non-cohesive soils.

- Sampling and logging of the boreholes. Packing, labeling and dispatching the samples to laboratory.
- Field investigation, tests and laboratory tests conducted as per IS-1892 and IS -2720

### 1.3 FIELD SAMPLING

Five numbers of standard soil investigation boreholes of 100mm diameter was made at the locations shown in the drawing, **MSGTPL/SI-5751-R2** enclosed. Investigations were carried up to maximum depth of 10.0m from existing ground level where SPT is more than 50blows. SPTs were conducted at every 1.0/1.5m depth intervals and samples were collected for identification and testing.

| Reference Bore No | Depth Drilled |
|-------------------|---------------|
| BH-1              | 10.0          |
| BH-2              | 5.5           |
| BH-3              | 6.0           |
| BH-4              | 10.0          |
| BH-5              | 9.5           |

### 1.4 LABORATORY TESTS

The laboratory-testing scheme is so designed to obtain the design parameters for the foundations. The following parameters are evaluated:

- Type of soil and it's gradation properties
- Atterberg Limits
- Specific Gravity
- Natural Moisture Content (NMC)
- Strength Parameters such as Cohesion,
- Angle of Shearing Resistance
- Sieve analysis on the coarse-grained soil fraction

All the test results are presented in the tabular forms. Comprehensive field information along with SPT values is presented on separate sheet.

## 1.5 SOIL PROFILE

Based on visual identification of soil samples and test results (of both field and laboratory tests), the soil profile arrived. Subsoil is made-up of four distinctive layers there are

- (i) Dense to very dense moorum up to -3.0m with **SPT's N=42->50**
- (ii) Soft Disintegrated Rock -3.0m to -4.50m with **SPT's N=>100**
- (iii) Soft Rock -4.50m to -8.0m with **CR is 5% to 10.66%, RQD is 0%**
- (iv) Hard Rock-8.0m to 10.0m with **CR is 14.66% to 84%, RQD is 14.66 to 80%**

The soil profile details are presented in the bore-chart.

## 1.6 GROUND WATER TABLE

Determination of Ground Water Table and water depth from Existing Ground level was done using Steel tape with weight. The depth of Ground water table was determined as per procedure laid in IS 6935-1973. At the time of Soil Investigation (16/02/2023 to 20/02/2023) at site, ground water table was encountered at (-)1.0m with in the investigated depth.

## 1.7 DISCUSSION ON FOUNDATION

From the sub soil profile and laboratory test data seen that, soil is good and compacted from 3.0m to 10.0m from existing ground level.

The boreholes recorded stiff clay and dense to very dense moorum soil layers up to 3.0m depth and followed by soft disintegrated rock up to 4.50m depth. From 4.50m to 8.0m soft rock and highly fractured hard rock layer are encountered. From 8 to 10.0m hard rock layer is encountered. Rock core recovery's and RQD are mentioned in the bore logs.

- (i) The residential building size is approximately 30.0m x 60.0m (1800 Sq.m), The Load intensity is taken as below

Load from 1 Basements =  $1 \times 1.5 = 1.50 \text{ Ton/Sq.m}$

Load from 11 floors (1silt+11 floors) =  $12 \times 1.5 = 18.0 \text{ Ton/Sq.m}$

Load from Roof=  $2 \text{ Ton/Sq.m}$

Assuming Raft Thick 1.0m =  $2.5 \text{ Ton/Sq.m}$

Total load from all the floors (1Basement+1stilt+11floors) + Raft-Slab per unit area of the tower foot print =  $1.50+18.0+2+2.5=24.0\text{Ton/Sq.m}$

**Total Gross Bearing Pressure at Base of the Raft=24.0 Ton/Sq.m**

Net bearing pressure = Gross bearing pressure overburden pressure @ base of footing

Overburden pressure =  $1 \times 1.8 + 3.0 \times 1.0 = 4.8\text{Ton/Sq.m}$  (Design GWT=1.0m)

(1 Basements Depth (1\*3.0) = 3.0m+1.0m Raft thick= 4.0m)

**Net Bearing Pressure on Raft= 24.0–4.8=19.2Ton/Sq.m Say=19Ton/Sq.m**

## 1.8 RECOMMENDATIONS

### At this location the proposed residential building

(1 Basement+Stilt+11upper floors)

- Reference boreholes is BH-1 to BH-5
- The building size Assumed 30.0m x 60.0m (1800 Sq.m)
- Type of Foundation: Isolated/Combined Raft/Full Raft
- Depth Foundation: 4.0m
- Foundation strata is Soft Disintegrated Rock/Soft rock
- SBC at 4.0m depth = **40 Ton/sq.m**
- Settlement's = 16mm

### General Recommendations

- ✓ **Basement slab should be designed against up lift pressure**
- ✓ **During basement excavation proper protection shall be adopted to avoid the soil collapse from sides, like secant piles or retaining wall etc.**
- ✓ The raft should be adequately stiffened with sufficient reinforcement at top and bottom so that the anticipated seasonal movement can be satisfactorily sustained without distress
- ✓ Foundation should rest on 150mm thick 1:4:6 concrete mat
- ✓ Columns shall be tied in both directions at plinth level.
- ✓ All foundation works should be done in dry conditions only.
- ✓ Proper dewatering technique can be adopted during construction.

*Vasanthi*  
**VASANTHI PADMANABAN, M.Tech.,**  
Registered Geotechnical Engineer  
Reg. No: CGLRGN/RGTE/2019/08/011

Geo-Technical Investigation Report 4

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 sub-soil conditions and properties at places between or beyond the chosen test locations, MARS Geotech Pvt Ltd may be contacted for further actions. Fresh investigations will have to be carried out at such locations.

## 2.0 DETERMINATION OF BEARING CAPACITY OF SHALLOW FOUNDATIONS

[Based On IS: 6403-1981]

### Assuming the Building Size 10Mx20M (conservative Side)

Failure Mode - General Shear

Size footing is assumed =2x2m

Depth of Foundation: 4.0m

Existing Ground level: 0.00M

Ground Water Table level: -0.00M (Due to Heavy Rain Temporary)

Bulk Density (W) of Soil above Footing Base: 1.80

Submerged Density (W') of Soil above Footing Base: 1.0T/Cu.M.

Bulk Density (W) of Soil Below Footing Base: 2.0T/Cu.M.

Factor of Safety: 2.5

Shape factor      Depth Factor      Inclination Factor

Sc = 1.00      Dc = 1.00      Ig = 1.000 (Conservative Side)

Water Table Correction Factor w' = 0.50

Ultimate Net B.C. =  $Q_{ult\_n} = C * N_c * S_c * D_c * I_c$

Soft Rock Compression Strength= 40 T/Sq.m

Bearing Capacity Factors

Nc = 5.14

$Q_{ult\_n} = 40 * 5.14 * 1 * 1 * 1 = 205.6 \text{ Ton/Sq.m}$

Thus  $Q_{ult\_n} = 205.6 \text{ T/Sq.M.}$

Allowable Bearing Capacity (Qall) = 82.24Ton/Sq.m

Water correction =  $82.24 * 0.5 = 41.12 \text{ Ton/Sq.m}$

**Say= 40T/m<sup>2</sup>**

### SETTLEMENTS FOR MULTI STORIED BUILDING

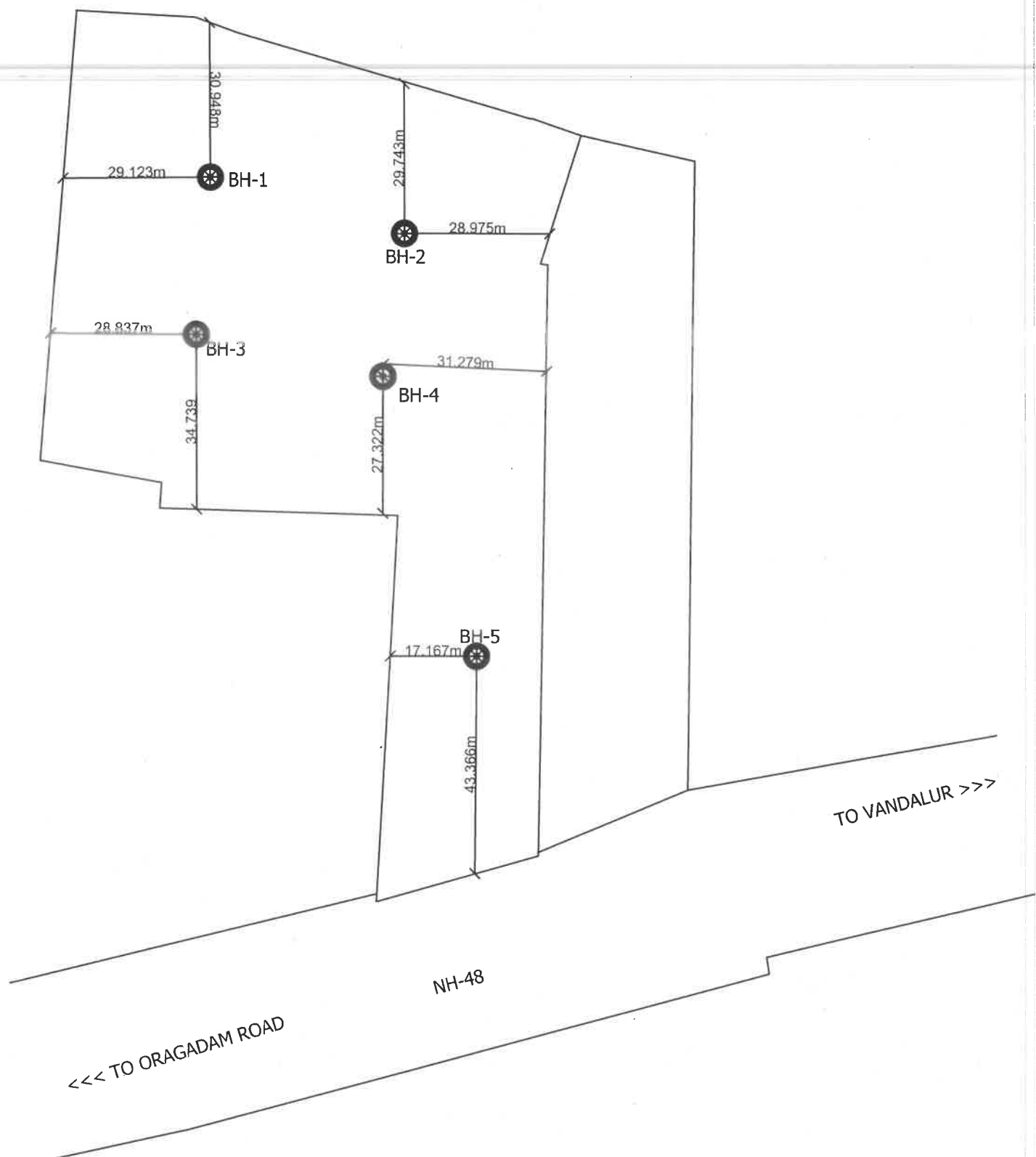
The soil at founding level is (-4.0m) Soft disintegrated Rock,  $N=>100$  hence used IS-8009 part-1, fig-9.

The SPT  $N=>60$  is  $4.0 \times 10^{-3} = 0.0040$

Under a load intensity of  $40\text{t/m}^2 (4.0\text{Kg/cm}^2) = 0.004 \times 4.0 = 0.16\text{m}$

**Total Settlement =  $0.016 \times 1000$**

**16.0mm < 25mm Hence safe**



**TITLE:** DRAWING SHOWING THE SOIL INVESTIGATION BORE HOLE LOCATIONS

**PROJECT:** PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (1BASEMENT+S+11)  
AT PADAPPAI

**LEGEND:**

| BH: BORE HOLE  -SOIL TEST LOCATION    SCALE: N T S |             |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|---------------|
| ACTIVITY                                                                                                                              | EXECUTED BY | DATE STARTED | DATE FINISHED |
| FOREMEN                                                                                                                               | RAJESH      | 16.02.2023   | 20.02.2023    |
| DRAFTING                                                                                                                              | J.B         | 01.03.2023   | 01.03.2023    |



**M S** **MARS SYNERGY GEOTECH Pvt Ltd**  
(An ISO 9001: 2015 Certified Company)  
**GEOTECH** Engineering Survey & Soil Investigation  
Geotechnical, Geophysical & Engineering Survey in Offshore & Onshore  
Plot No: 145A, Developed Plots Estate, Perungudi, Chennai-600 096,  
Mobile: 94440 51563 / 94441 22047

DRAWING NO: MSGTPL/SI-5751-R2/22-23

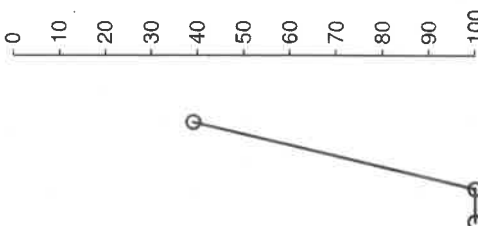
## BOREHOLE LOG

Project No: MSGTPL/SI-5751-R2/22-23

Project: Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|            |          |
|------------|----------|
| Location   | Padappai |
| Ground R.L | Nil      |
| Drilling   | Rotary   |

|                       |             |
|-----------------------|-------------|
| Borehole No           | BH-1        |
| G.W.T (m)             | (-)1.0m     |
| Date of Start         | 17-Feb-2023 |
| Date of Complete      | 18-Feb-2023 |
| Dia of Bore (mm)      | 100         |
| Termination Depth (m) | 10.00       |
| Sheet                 | 1 of 1      |

| Depth below EGL (m) | Layer Thickness | Soil Layers Description                  | Soil Symbol | IS-Classification | Type Field Test | Test Depth (m) | SPT Values Record<br>0 to 45cm | SPT- N- Value | Graphical Representation of SPT                                                      |
|---------------------|-----------------|------------------------------------------|-------------|-------------------|-----------------|----------------|--------------------------------|---------------|--------------------------------------------------------------------------------------|
| 0.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 0.5                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 1.0                 | 2.0             | Dense to Very Dense Light Greyish Moorum |             | SM                | SPT             | 1.0            | 5 14 25                        | 39            |  |
| 1.5                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 2.0                 |                 |                                          |             |                   | SPT             | 2.0            | 15 50 Blows for 10Cm           |               |                                                                                      |
| 2.5                 | 0.5             | Soft Disintegrated Rock                  |             | GP                | SPT             | 2.5            | 50 Blows for 0Cm               |               |                                                                                      |
| 3.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 3.5                 | 1.0             | Hard Rock                                |             | Very Poor         | Rock            | 3.5            | C.R=27%,RQD=14%                |               |                                                                                      |
| 4.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 4.5                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 4.5                 | 2.0             | Fractured Hard Rock                      |             | Fair              | Rock            | 4.5            | C.R=90%,RQD=60.5%              |               |                                                                                      |
| 5.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 5.5                 |                 |                                          |             |                   | Rock            | 5.5            | C.R=88.5%,RQD=54.5%            |               |                                                                                      |
| 6.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 6.5                 |                 |                                          |             |                   | Rock            | 6.5            | C.R=72%,RQD=72%                |               |                                                                                      |
| 7.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 7.5                 |                 |                                          |             |                   | Rock            | 7.5            | C.R=100%,RQD=100%              |               |                                                                                      |
| 8.0                 | 4.5             | Hard Rock                                |             | Excellent         |                 |                |                                |               |                                                                                      |
| 8.5                 |                 |                                          |             |                   | Rock            | 8.5            | C.R=94%,RQD=90%                |               |                                                                                      |
| 9.0                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 9.5                 |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 10.0                |                 |                                          |             | Good              | Rock            | 10.0           | C.R=84%,RQD=80%                |               |                                                                                      |
| 10.5                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 11.0                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 11.5                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 12.0                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 12.5                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 13.0                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 13.5                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 14.0                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 14.5                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |
| 15.0                |                 |                                          |             |                   |                 |                |                                |               |                                                                                      |

Borehole Termination Depth (m) 10.0

EGL- Existing Ground Level

R.L- Reduced Level

GWT- Ground Water Table

SPT- Standard Penetration Test

UDS- Undisturbed Sample

VST- Vane Shear Test

DS- Disturbed Sample

CR- Core Recovery

RQD- Rock Quality Designation

## BOREHOLE LOG

Project No: MSGTPL/SI-5751-R2/22-23

Project: Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|            |          |
|------------|----------|
| Location   | Padappai |
| Ground R.L | Nil      |
| Drilling   | Rotary   |

|                       |             |        |
|-----------------------|-------------|--------|
| Borehole No           | BH-2        |        |
| G.W.T (m)             | (-)1.0m     |        |
| Date of Start         | 16-Feb-2023 |        |
| Date of Complete      | 16-Feb-2023 |        |
| Dia of Bore (mm)      | 100         | Sheet  |
| Termination Depth (m) | 5.50        | 1 of 1 |

| Depth below EGL (m) | Layer Thickness | Soil Layers Description             | Soil Symbol | IS-Classification | Type Field Test | Test Depth (m) | SPT Values Record<br>0 to 45cm | SPT- N- Value     | Graphical Representation of SPT |
|---------------------|-----------------|-------------------------------------|-------------|-------------------|-----------------|----------------|--------------------------------|-------------------|---------------------------------|
| 0.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 0.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 1.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 1.5                 | 3.0             | Dense to Very Dense Brownish Moorum |             | SM-SW             | SPT             | 1.0            | 5 12 30                        | 42                |                                 |
| 2.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 2.5                 |                 |                                     |             |                   | SPT             | 2.0            | 23 48                          | 50 Blows for 13Cm |                                 |
| 3.0                 |                 |                                     |             |                   | SPT             | 3.0            | 28                             | 50 Blows for 10Cm |                                 |
| 3.5                 | 1.0             | Soft Disintegrated Rock             |             | GP                |                 |                |                                |                   |                                 |
| 4.0                 |                 |                                     |             |                   | SPT             | 4.0            |                                | 50 Blows for 9Cm  |                                 |
| 4.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 5.0                 | 1.5             | Fractured Hard Rock                 |             | Very Poor         |                 |                |                                |                   |                                 |
| 5.5                 |                 |                                     |             |                   | Rock            | 5.5            | C.R=24.33%, RQD=19.66%         |                   |                                 |
| 6.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 6.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 7.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 7.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 8.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 8.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 9.0                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 9.5                 |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 10.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 10.5                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 11.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 11.5                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 12.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 12.5                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 13.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 13.5                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 14.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 14.5                |                 |                                     |             |                   |                 |                |                                |                   |                                 |
| 15.0                |                 |                                     |             |                   |                 |                |                                |                   |                                 |

Borehole Termination Depth (m) 5.5

EGL- Existing Ground Level

R.L- Reduced Level

GWT- Ground Water Table

SPT- Standard Penetration Test

UDS- Undisturbed Sample

VST- Vane Shear Test

DS- Disturbed Sample

CR- Core Recovery

RQD- Rock Quality Designation

## BOREHOLE LOG

Project No: MSGTPL/SI-5751-R2/22-23

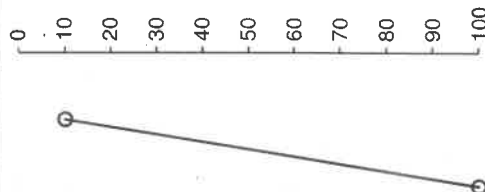
Project: Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|            |          |
|------------|----------|
| Location   | Padappai |
| Ground R.L | Nil      |
| Drilling   | Rotary   |

|                       |              |
|-----------------------|--------------|
| Borehole No           | BH-3         |
| G.W.T (m)             | (-)1.0m      |
| Date of Start         | 19-Feb-2023  |
| Date of Complete      | 20-Feb-2023  |
| Dia of Bore (mm)      | 100          |
| Termination Depth (m) | 6.00         |
|                       | Sheet 1 of 1 |

| Depth below EGL (m) | Layer Thickness | Soil Layers Description | Soil Symbol | IS-Classification | Type Field Test | Test Depth (m) | SPT Values Record 0 to 45cm | SPT- N- value |
|---------------------|-----------------|-------------------------|-------------|-------------------|-----------------|----------------|-----------------------------|---------------|
| 0.0                 | 1.0             | Stiff Brownish CLAY     |             | CH                |                 |                |                             |               |
| 0.5                 |                 |                         |             |                   |                 |                |                             |               |
| 1.0                 |                 |                         |             |                   | SPT             | 1.0            | 2 4 6                       | 10            |
| 1.5                 | 1.0             | Soft Disintegrated Rock |             | GP                |                 |                |                             |               |
| 2.0                 |                 |                         |             |                   | SPT             | 2.0            | 50 Blows for 1Cm            |               |
| 2.5                 | 1.0             | Soft Rock               |             | Very Poor         |                 |                |                             |               |
| 3.0                 |                 |                         |             |                   | Rock            | 3.0            | CR=10%                      |               |
| 3.5                 | 1.0             | Hard Rock               |             | Very Poor         |                 |                |                             |               |
| 4.0                 |                 |                         |             |                   | Rock            | 4.0            | CR=13%                      |               |
| 4.5                 | 1.0             | Hard Rock               |             | Poor              |                 |                |                             |               |
| 5.0                 |                 |                         |             |                   | Rock            | 5.0            | CR=36%, RQD=31%             |               |
| 5.5                 | 1.0             | Hard Rock               |             | Fair              |                 |                |                             |               |
| 6.0                 |                 |                         |             |                   | Rock            | 6.0            | CR=71%, RQD=71%             |               |
| 6.5                 |                 |                         |             |                   |                 |                |                             |               |
| 7.0                 |                 |                         |             |                   |                 |                |                             |               |
| 7.5                 |                 |                         |             |                   |                 |                |                             |               |
| 8.0                 |                 |                         |             |                   |                 |                |                             |               |
| 8.5                 |                 |                         |             |                   |                 |                |                             |               |
| 9.0                 |                 |                         |             |                   |                 |                |                             |               |
| 9.5                 |                 |                         |             |                   |                 |                |                             |               |
| 10.0                |                 |                         |             |                   |                 |                |                             |               |
| 10.5                |                 |                         |             |                   |                 |                |                             |               |
| 11.0                |                 |                         |             |                   |                 |                |                             |               |
| 11.5                |                 |                         |             |                   |                 |                |                             |               |
| 12.0                |                 |                         |             |                   |                 |                |                             |               |
| 12.5                |                 |                         |             |                   |                 |                |                             |               |
| 13.0                |                 |                         |             |                   |                 |                |                             |               |
| 13.5                |                 |                         |             |                   |                 |                |                             |               |
| 14.0                |                 |                         |             |                   |                 |                |                             |               |
| 14.5                |                 |                         |             |                   |                 |                |                             |               |
| 15.0                |                 |                         |             |                   |                 |                |                             |               |

## Graphical Representation of SPT



Borehole Termination Depth (m) 6.0

EGL- Existing Ground Level

R.L- Reduced Level

GWT- Ground Water Table

SPT- Standard Penetration Test

UDS- Undisturbed Sample

VST- Vane Shear Test

DS- Disturbed Sample

CR- Core Recovery

RQD- Rock Quality Designation

## BOREHOLE LOG

Project No: MSGTPL/SI-5751-R2/22-23

Project: Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|            |          |
|------------|----------|
| Location   | Padappai |
| Ground R.L | Nil      |
| Drilling   | Rotary   |

|                       |             |        |
|-----------------------|-------------|--------|
| Borehole No           | BH-4        |        |
| G.W.T (m)             | (-)1.0m     |        |
| Date of Start         | 18-Feb-2023 |        |
| Date of Complete      | 20-Feb-2023 |        |
| Dia of Bore (mm)      | 100         | Sheet  |
| Termination Depth (m) | 10.00       | 1 of 1 |

| Depth below EGL (m) | Layer Thickness | Soil Layers Description    | Soil Symbol | IS-Classification | Type Field Test | Test Depth (m) | SPT Values Record 0 to 45cm | SPT- N- Value | Graphical Representation of SPT |
|---------------------|-----------------|----------------------------|-------------|-------------------|-----------------|----------------|-----------------------------|---------------|---------------------------------|
| 0.0                 | 1.0             | Dense Brownish Clayey SAND |             | SC                |                 |                |                             |               |                                 |
| 0.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 1.0                 |                 |                            |             |                   | SPT             | 1.0            | 5 11 31                     | 42            |                                 |
| 1.5                 | 1.0             | Very Dense Brownish Moorum |             | SW                |                 |                |                             |               |                                 |
| 2.0                 |                 |                            |             |                   | SPT             | 2.0            | 50 Blows for 13Cm           |               |                                 |
| 2.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 3.0                 | 2.0             | Soft Disintegrated Rock    |             | GP                | SPT             | 3.0            | 50 Blows for 2Cm            |               |                                 |
| 3.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 4.0                 |                 |                            |             |                   | SPT             | 4.0            | 50 Blows for 1Cm            |               |                                 |
| 4.5                 | 1.0             | Soft Rock                  |             | Very Poor         |                 |                |                             |               |                                 |
| 5.0                 |                 |                            |             |                   | Rock            | 5.0            | CR=4%                       |               |                                 |
| 5.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 6.0                 | 2.5             | Hard Rock                  |             | Very Poor         |                 |                |                             |               |                                 |
| 6.5                 |                 |                            |             |                   | Rock            | 6.5            | CR=8.66%                    |               |                                 |
| 7.0                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 7.5                 |                 |                            |             |                   | Rock            | 7.5            | CR=54%, RQD=17%             |               |                                 |
| 8.0                 | 2.5             | Hard Rock                  |             | Fair              |                 |                |                             |               |                                 |
| 8.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 9.0                 |                 |                            |             |                   | Rock            | 9.0            | CR=74.66%, RQD=60%          |               |                                 |
| 9.5                 |                 |                            |             |                   |                 |                |                             |               |                                 |
| 10.0                |                 |                            |             |                   | Rock            | 10.0           | CR=82.5%, RQD=64.5%         |               |                                 |
| 10.5                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 11.0                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 11.5                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 12.0                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 12.5                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 13.0                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 13.5                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 14.0                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 14.5                |                 |                            |             |                   |                 |                |                             |               |                                 |
| 15.0                |                 |                            |             |                   |                 |                |                             |               |                                 |

Borehole Termination Depth (m) 10.0

EGL- Existing Ground Level

R.L- Reduced Level

GWT- Ground Water Table

SPT- Standard Penetration Test

UDS- Undisturbed Sample

VST- Vane Shear Test

DS- Disturbed Sample

CR- Core Recovery

RQD- Rock Quality Designation

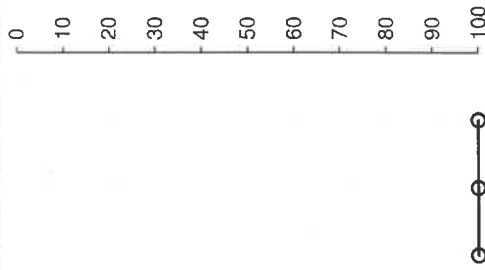
## BOREHOLE LOG

Project No: MSGTPL/SI-5751-R2/22-23

Project: Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|            |          |
|------------|----------|
| Location   | Padappai |
| Ground R.L | Nil      |
| Drilling   | Rotary   |

|                       |             |        |
|-----------------------|-------------|--------|
| <b>Borehole No</b>    | <b>BH-5</b> |        |
| G.W.T (m)             | (-)1.0m     |        |
| Date of Start         | 20-Feb-2023 |        |
| Date of Complete      | 20-Feb-2023 |        |
| Dia of Bore (mm)      | 100         | Sheet  |
| Termination Depth (m) | 9.50        | 1 of 1 |

| Depth below EGL (m) | Layer Thickness | Soil Layers Description         | Soil Symbol | IS-Classification | Type Field Test | Test Depth (m) | SPT Values Record<br>0 to 45cm | SPT- N- Value     | Graphical Representation of SPT                                                     |
|---------------------|-----------------|---------------------------------|-------------|-------------------|-----------------|----------------|--------------------------------|-------------------|-------------------------------------------------------------------------------------|
| 0.0                 | 1.0             | Very Dense Brownish Clayey SAND |             | SC                |                 |                |                                |                   |  |
| 0.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 1.0                 |                 |                                 |             |                   | SPT             | 1.0            | 9 35                           | 50 Blows for 10Cm |                                                                                     |
| 1.5                 | 2.0             | Soft Disintegrated Rock         |             | GP                |                 |                |                                |                   |                                                                                     |
| 2.0                 |                 |                                 |             |                   | SPT             | 2.0            | 50 Blows for 2Cm               |                   |                                                                                     |
| 2.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 3.0                 | 5.0             | Soft Rock                       |             | Very Poor         | SPT             | 3.0            | 50 Blows for 1Cm               |                   |                                                                                     |
| 3.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 4.0                 |                 |                                 |             |                   | Rock            | 4.0            | CR=5%                          |                   |                                                                                     |
| 4.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 5.0                 |                 |                                 |             |                   | Rock            | 5.0            | CR=8%                          |                   |                                                                                     |
| 5.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 6.0                 |                 |                                 |             |                   | Rock            | 6.0            | CR=14%                         |                   |                                                                                     |
| 6.5                 |                 |                                 |             |                   | Rock            | 6.5            | CR=46%                         |                   |                                                                                     |
| 7.0                 | 1.5             | Hard Rock                       |             | Very Poor         |                 |                |                                |                   |                                                                                     |
| 7.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 8.0                 |                 |                                 |             |                   | Rock            | 8.0            | CR=10.66%                      |                   |                                                                                     |
| 8.5                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 9.0                 |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 9.5                 |                 |                                 |             |                   | Rock            | 9.5            | CR=14.66%                      |                   |                                                                                     |
| 10.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 10.5                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 11.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 11.5                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 12.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 12.5                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 13.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 13.5                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 14.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 14.5                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |
| 15.0                |                 |                                 |             |                   |                 |                |                                |                   |                                                                                     |

Borehole Termination Depth (m) 9.5

EGL- Existing Ground Level

R.L- Reduced Level

GWT- Ground Water Table

SPT- Standard Penetration Test

UDS- Undisturbed Sample

VST- Vane Shear Test

DS- Disturbed Sample

CR- Core Recovery

RQD- Rock Quality Designation

# 5.0 TEST RESULTS

| Project No: MSGTPL/SL-5751-R2/22-23                                                |                 |           |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
|------------------------------------------------------------------------------------|-----------------|-----------|------------------------------------------|-------------------|----------------------|----------------|-------------------------|----------------|------------------|-------------------------|-------------|-------------|-----------|-------------|----|--|--|--|--|
| Project : Proposed Construction of Residential Building (1Basement+S+1)at Padappai |                 |           |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| BH No                                                                              |                 | 1         | Ground Water Level: (-)1.0m              |                   |                      |                | Termination Depth:10.0m |                |                  |                         |             |             |           |             |    |  |  |  |  |
| SUMMARY OF TEST RESULTS                                                            |                 |           |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| N' Value                                                                           | Layer Thickness | Depth (m) | Soil Description                         | IS Classification | Index Properties (%) |                |                         |                | Specific Gravity | Grain Size Analysis (%) |             |             |           |             |    |  |  |  |  |
|                                                                                    |                 |           |                                          |                   | W <sub>L</sub>       | W <sub>p</sub> | I <sub>p</sub>          | I <sub>c</sub> |                  | FreeSwell               | Coarse Sand | Medium Sand | Fine Sand | Silt & Clay |    |  |  |  |  |
|                                                                                    |                 | 0.00      |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| 39                                                                                 | 2.0             | 1.00      | Dense to Very Dense Light Greyish Moorum | SM                | 24                   |                |                         |                |                  |                         | 39          | 6           | 14        | 12          | 29 |  |  |  |  |
| >100                                                                               |                 | 2.00      |                                          |                   | 21                   |                |                         |                |                  | 2.61                    | 17          | 19          | 21        | 18          | 25 |  |  |  |  |
| >100                                                                               | 0.5             | 2.50      | Soft Disintegrated Rock                  | GP                |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               | 1.0             | 3.50      | Hard Rock                                | Very Poor         |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               | 2.0             | 4.50      | Fractured Hard Rock                      | Fair              |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               |                 | 5.50      |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               |                 | 6.50      |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               | 4.5             | 7.50      | Hard Rock                                | Good-Excellent    |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               |                 | 8.50      |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |
| Rock                                                                               |                 | 10.00     |                                          |                   |                      |                |                         |                |                  |                         |             |             |           |             |    |  |  |  |  |





| Project No: MSGTPL/SI-5751-R2/22-23                                                 |                 |           |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
|-------------------------------------------------------------------------------------|-----------------|-----------|----------------------------|-----------------------------|----------------------|----------------|----------------|----------------|-------------------------|------------------|-------------------------|--------|-------------|-------------|-----------|-------------|
| Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai |                 |           |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| BH No                                                                               |                 | 4         |                            | Ground Water Level: (-)1.0m |                      |                |                |                | Termination Depth:10.0m |                  |                         |        |             |             |           |             |
| SUMMARY OF TEST RESULTS                                                             |                 |           |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| N' Value                                                                            | Layer Thickness | Depth (m) | Soil Description           | IS Classification           | Index Properties (%) |                |                |                |                         | Specific Gravity | Grain Size Analysis (%) |        |             |             |           |             |
|                                                                                     |                 |           |                            |                             | NMC                  | W <sub>L</sub> | W <sub>p</sub> | I <sub>p</sub> | I <sub>c</sub>          |                  | FreeSwell               | Gravel | Coarse Sand | Medium Sand | Fine Sand | Silt & Clay |
| 42                                                                                  | 1.0             | 0.00      | Dense Brownish Clayey SAND | SC                          | 15                   |                |                |                |                         | 2.69             | 14                      | 26     | 19          | 16          | 25        |             |
|                                                                                     |                 | 1.00      |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| >100                                                                                | 1.0             | 2.00      | Very Dense Brownish Moorum | SW                          | 8                    |                |                |                |                         |                  | 2.64                    | 38     | 20          | 22          | 13        | 7           |
| >100                                                                                | 2.0             | 3.00      | Soft Disintegrated Rock    | GP                          |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| >100                                                                                |                 | 4.00      |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| Rock                                                                                | 1.0             | 5.00      | Soft Rock                  | Very Poor                   |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| Rock                                                                                | 2.5             | 6.50      | Hard Rock                  | Very Poor                   |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| Rock                                                                                |                 | 7.50      |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| Rock                                                                                | 2.5             | 9.00      | Hard Rock                  | Fair                        |                      |                |                |                |                         |                  |                         |        |             |             |           |             |
| Rock                                                                                |                 | 10.00     |                            |                             |                      |                |                |                |                         |                  |                         |        |             |             |           |             |

| Project No: MSGTPL/SI-5751-R2/22-23                                                 |                 |              |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
|-------------------------------------------------------------------------------------|-----------------|--------------|---------------------------------|-----------------------------|----------------------|-------------------------|----------------|----------------|----------------|-------------------------|------------------|-------------------------|-------------|-----------|-------------|--|
| Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai |                 |              |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| BH No                                                                               |                 | 5            |                                 | Ground Water Level: (-)1.0m |                      |                         |                |                |                | Termination Depth:9.50m |                  |                         |             |           |             |  |
| SUMMARY OF TEST RESULTS                                                             |                 |              |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| N' Value                                                                            | Layer Thickness | Depth (m)    | Soil Description                | IS Classification           | Index Properties (%) |                         |                |                |                | FreeSwell               | Specific Gravity | Grain Size Analysis (%) |             |           |             |  |
|                                                                                     |                 |              |                                 |                             | NMC                  | W <sub>L</sub>          | W <sub>p</sub> | I <sub>p</sub> | I <sub>c</sub> |                         |                  | Coarse Sand             | Medium Sand | Fine Sand | Silt & Clay |  |
| >100                                                                                | 1.0             | 0.00<br>1.00 | Very Dense Brownish Clayey SAND | SC                          | 18                   |                         |                |                |                |                         | 2.68             | 6                       | 23          | 28        | 42          |  |
| >100                                                                                | 2.0             | 2.00<br>3.00 |                                 |                             |                      | Soft Disintegrated Rock | GP             |                |                |                         |                  |                         |             |           |             |  |
| >100                                                                                |                 | 4.00         | Soft Rock                       | Very Poor                   |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| Rock                                                                                |                 | 5.00         |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| Rock                                                                                | 5.0             | 6.00         |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| Rock                                                                                |                 | 6.50         |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| Rock                                                                                |                 | 8.00         | Hard Rock                       | Very Poor                   |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |
| Rock                                                                                | 1.5             | 9.50         |                                 |                             |                      |                         |                |                |                |                         |                  |                         |             |           |             |  |



**NABL**  
CERTIFICATE NO:TC-8678

ULR-TC867823100000048F

**Project No: MSGTPL/SI-5751-R2/22-23**  
**Project :Proposed Construction of Residential Building (1Basement+S+11)at Padappai**

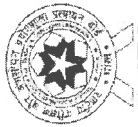
**Method: IS-2720 P-2**

**Natural Moisture Content Data Sheet**

| BH.No/ Pit no             | 1     |       | 2     |       | 2     |       | 2     |       | 3     |       |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                           | 1.0   |       | 2.0   |       | 1.0   |       | 2.0   |       | 1.0   |       |
| Tare No                   | 187   | 247   | 205   | 48    | 27    | 35    | 147   | 46    | 47    | 135   |
| Wt of Tare (gr)           | 29.61 | 30.38 | 29.49 | 28.99 | 29.63 | 30.77 | 28.14 | 29.74 | 31.80 | 29.06 |
| Tare + Soil (gr)          | 53.85 | 54.99 | 58.22 | 55.48 | 56.98 | 60.78 | 57.75 | 63.99 | 60.99 | 55.22 |
| Tare+Dry soil (gr)        | 49.16 | 50.29 | 53.20 | 50.85 | 52.78 | 56.17 | 55.71 | 61.63 | 59.07 | 53.50 |
| Wt of Water (gr)          | 4.69  | 4.70  | 5.02  | 4.63  | 4.20  | 4.61  | 2.04  | 2.36  | 1.92  | 1.72  |
| Wt Dry soil (gr)          | 19.55 | 19.91 | 23.71 | 21.86 | 23.15 | 25.40 | 27.57 | 31.89 | 27.27 | 24.44 |
| Water Content (%)         | 23.99 | 23.61 | 21.17 | 21.18 | 18.14 | 18.15 | 7.40  | 7.40  | 7.04  | 7.04  |
| Average Water Content (%) | 24    |       | 21    |       | 18    |       | 7     |       | 7     |       |
|                           |       |       |       |       |       |       |       |       | 21    |       |



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**NABL**  
CERTIFICATE NO:TC-8678

ULR-TC867823100000048F

**Project No: MSGTPL/SI-5751-R2/22-23**

**Project :Proposed Construction of Residential Building (1Basement+S+1')at Padappai**

**Method: IS-2720 P-2**

**Natural Moisture Content Data Sheet**

| BH.No/ Pit no             | 4     |       | 4     |       | 5     |       |
|---------------------------|-------|-------|-------|-------|-------|-------|
| Depth (m)                 | 1.0   |       | 2.0   |       | 1.0   |       |
| Tare No                   | 239   | 6     | 153   | 244   | 108   | 63    |
| Wt of Tare (gr)           | 29.86 | 30.11 | 29.46 | 29.99 | 29.77 | 29.97 |
| Tare + Soil (gr)          | 56.81 | 58.41 | 55.24 | 56.55 | 59.03 | 56.71 |
| Tare+Dry soil (gr)        | 53.33 | 54.75 | 53.43 | 54.68 | 54.60 | 52.66 |
| Wt of Water (gr)          | 3.48  | 3.66  | 1.81  | 1.87  | 4.43  | 4.05  |
| Wt Dry soil (gr)          | 23.47 | 24.64 | 23.97 | 24.69 | 24.83 | 22.69 |
| Water Content (%)         | 14.83 | 14.85 | 7.55  | 7.57  | 17.84 | 17.85 |
| Average Water Content (%) | 15    |       | 8     |       | 18    |       |



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CERTIFICATE NO:TC-8678

ULR-TC867823100000048F



Geotechnical, Geophysical &  
Engineering Survey in  
Offshore & Onshore

### SPECIFIC GRAVITY TEST

Project No:MSGTPL/SI-5751-R2/22-23

Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai

| BH.No                           | 1                                     |
|---------------------------------|---------------------------------------|
| Depth(m)                        | 2.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.61                                  |

| BH.No                           | 2                                     |
|---------------------------------|---------------------------------------|
| Depth(m)                        | 1.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.67                                  |



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**NABL**  
CERTIFICATE NO:TC-8678

ULR-TC867823100000048F

### SPECIFIC GRAVITY TEST

Project No:MSGTPL/SI-5751-R2/22-23

Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|                                 |                                       |
|---------------------------------|---------------------------------------|
| BH.No                           | 2                                     |
| Depth(m)                        | 2.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.67                                  |

|                                 |                                       |
|---------------------------------|---------------------------------------|
| BH.No                           | 2                                     |
| Depth(m)                        | 3.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.66                                  |

|  |  |   |         |
|--|--|---|---------|
|  |  | 4 | 47      |
|  |  | g | 35.0700 |
|  |  | g | 50.8900 |
|  |  | g | 97.3900 |
|  |  | g | 87.5000 |
|  |  | g | 15.8200 |
|  |  |   | 2.66779 |
|  |  |   | 2.66990 |
|  |  |   | 2.67    |

|  |  |    |         |
|--|--|----|---------|
|  |  | 42 | 50      |
|  |  | g  | 34.4900 |
|  |  | g  | 48.5600 |
|  |  | g  | 95.9900 |
|  |  | g  | 87.2100 |
|  |  | g  | 14.0700 |
|  |  |    | 2.65974 |
|  |  |    | 2.65779 |
|  |  |    | 2.66    |





**NABL**  
CERTIFICATE NO:IC-5678

ULR-TC867823100000048F

### SPECIFIC GRAVITY TEST

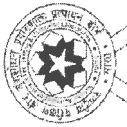
Project No:MSGTPL/SI-5751-R2/22-23

Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai

|                                 |                                       |
|---------------------------------|---------------------------------------|
| BH.No                           | 4                                     |
| Depth(m)                        | 1.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.69                                  |

|                                 |                                       |
|---------------------------------|---------------------------------------|
| BH.No                           | 4                                     |
| Depth(m)                        | 2.0                                   |
| Pycnometer number               |                                       |
| Weight of bottle                | w <sub>1</sub>                        |
| Weight of bottle + soil         | w <sub>2</sub>                        |
| Weight of bottle + soil + water | w <sub>3</sub>                        |
| Weight of bottle full of water  | w <sub>4</sub>                        |
| Weight of soil                  | w <sub>2</sub> -w <sub>1</sub>        |
| Specific gravity                | $\frac{w_2-w_1}{(w_4-w_1)-(w_3-w_2)}$ |
| Average value G <sub>s</sub>    | 2.64                                  |

|  |  |  |         |         |
|--|--|--|---------|---------|
|  |  |  | 85      | 5       |
|  |  |  | 34.8600 | 28.5400 |
|  |  |  | 53.7600 | 43.4200 |
|  |  |  | 98.2600 | 96.9400 |
|  |  |  | 86.5100 | 87.6900 |
|  |  |  | 18.9000 | 14.8800 |
|  |  |  | 2.64336 | 2.64298 |



**NABL**  
CERTIFICATE NO:TC-8678

ULR-TC867823100000048F

**SPECIFIC GRAVITY TEST**  
**Project No:MSGTPL/SI-5751-R2/22-23**  
**Project : Proposed Construction of Residential Building (1Basement+S+11)at Padappai**

|                                 |                             |   |         |         |
|---------------------------------|-----------------------------|---|---------|---------|
| BH.No                           | 5                           |   |         |         |
| Depth(m)                        | 1.0                         |   |         |         |
| Pycnometer number               |                             |   | 35      | 2       |
| Weight of bottle                | $w_1$                       | g | 34.5700 | 35.9100 |
| Weight of bottle + soil         | $w_2$                       | g | 49.4600 | 53.7100 |
| Weight of bottle + soil + water | $w_3$                       | g | 97.0300 | 98.5000 |
| Weight of bottle full of water  | $w_4$                       | g | 87.6900 | 87.3400 |
| Weight of soil                  | $w_2-w_1$                   | g | 14.8900 | 17.8000 |
| Specific gravity                | $w_2-w_1$                   |   |         |         |
|                                 | $(w_4-w_1) \cdot (w_3-w_2)$ |   | 2.68288 | 2.68072 |
| Average value $G_s$             |                             |   | 2.68    |         |





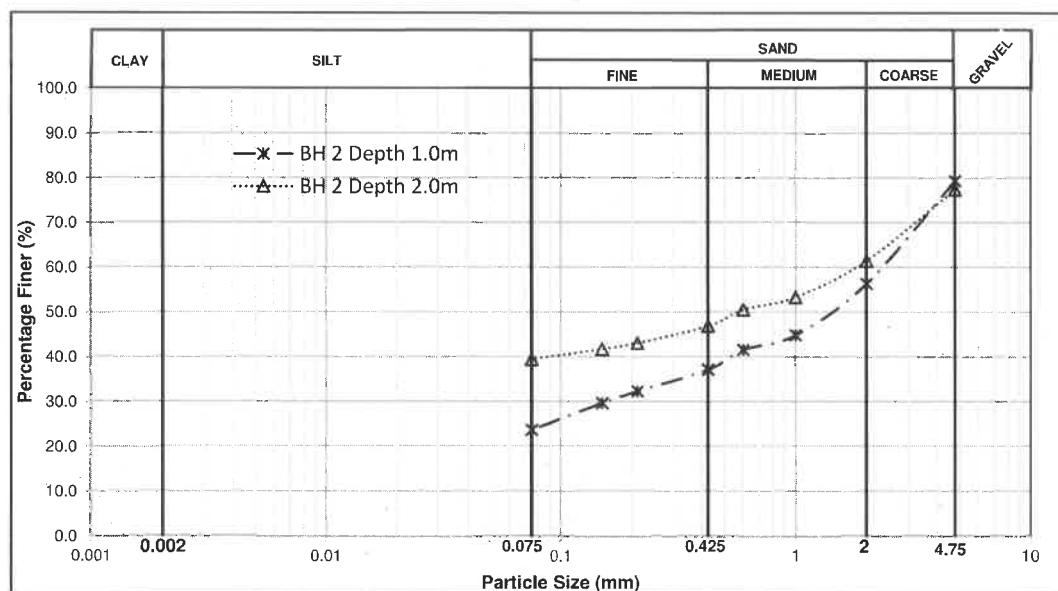
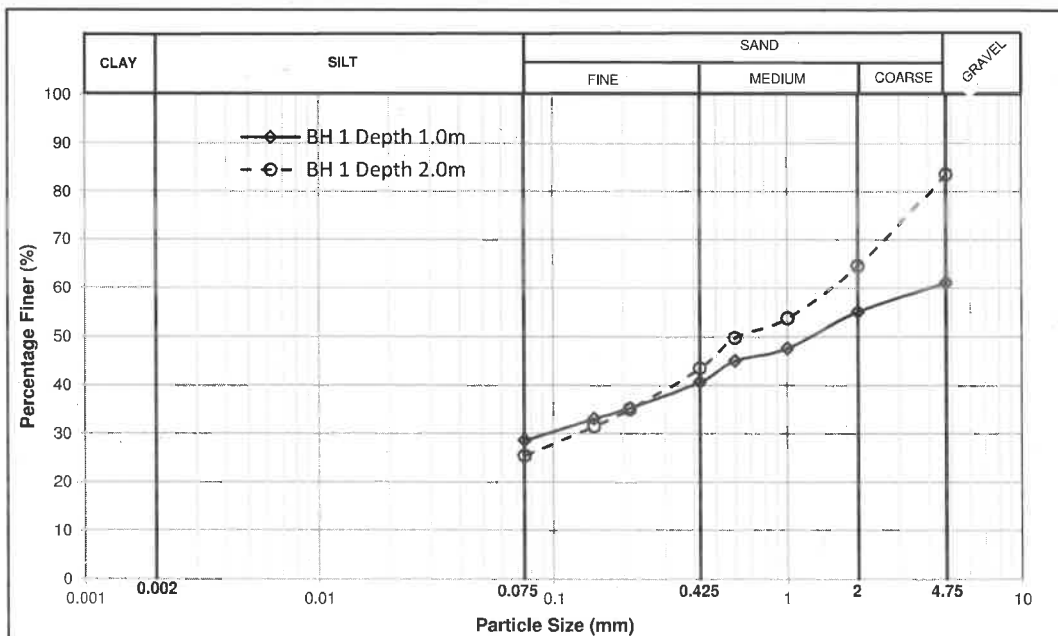
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Project No: MSGTPL/SI-5751-R2/22-23

Project :Proposed Construction of Residential Building (1Basement+S+11)at Padappai

### GRAIN SIZE ANALYSIS



| BH-No | Depth (m) | Gravel (%) | SAND (%) |        |      | SILT & CLAY (%) | D <sub>10</sub> (mm) | D <sub>30</sub> (mm) | D <sub>60</sub> (mm) | Cu | Cc |
|-------|-----------|------------|----------|--------|------|-----------------|----------------------|----------------------|----------------------|----|----|
|       |           |            | Coarse   | Medium | Fine |                 |                      |                      |                      |    |    |
| 1     | 1.0m      | 39         | 6        | 14     | 12   | 29              |                      | 0.099                | 4.229                |    |    |
| 1     | 2.0m      | 17         | 19       | 21     | 18   | 25              |                      | 0.131                | 1.569                |    |    |
| 2     | 1.0m      | 21         | 23       | 19     | 13   | 24              |                      | 0.149                | 2.235                |    |    |
| 2     | 2.0m      | 23         | 16       | 15     | 7    | 39              |                      |                      | 1.829                |    |    |



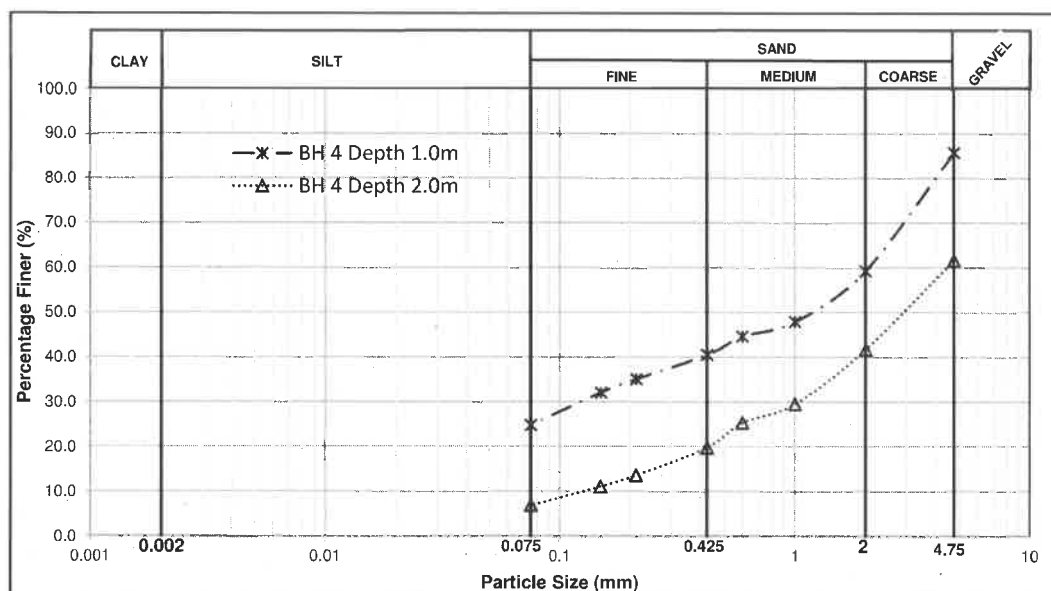
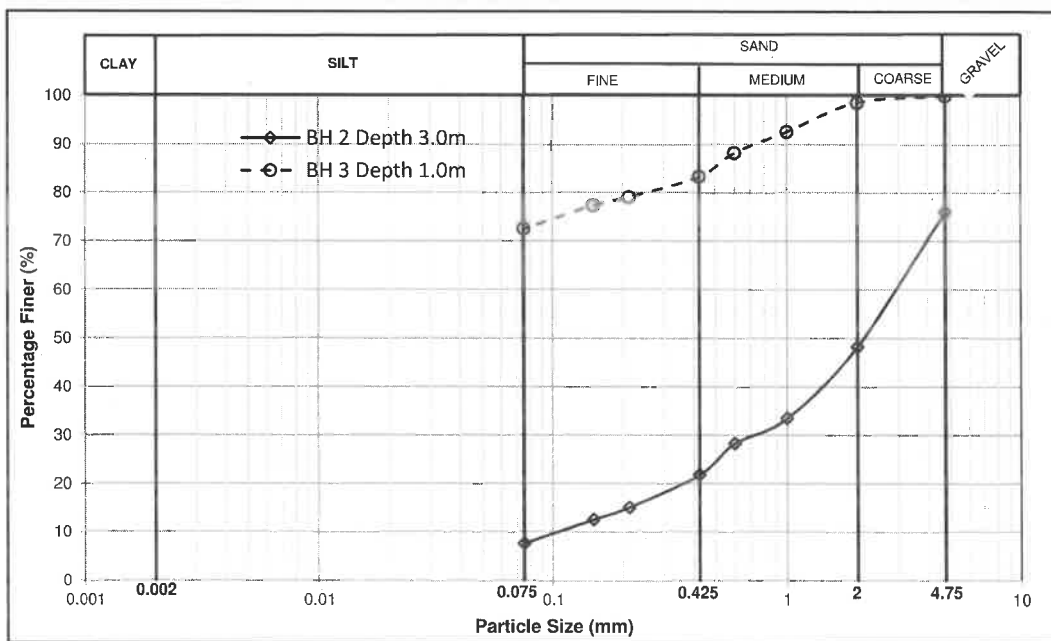
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CERTIFICATE NO.TC-8678

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Project No: MSGTPL/SI-5751-R2/22-23

Project :Proposed Construction of Residential Building (1Basement+S+11)at Padappai

### GRAIN SIZE ANALYSIS



| BH-No | Depth (m) | Gravel (%) | SAND (%) |        |      | SILT & CLAY (%) | D <sub>10</sub> (mm) | D <sub>30</sub> (mm) | D <sub>60</sub> (mm) | Cu | Cc |
|-------|-----------|------------|----------|--------|------|-----------------|----------------------|----------------------|----------------------|----|----|
|       |           |            | Coarse   | Medium | Fine |                 |                      |                      |                      |    |    |
| 2     | 3.0m      | 24         | 28       | 26     | 14   | 8               |                      | 0.733                | 3.163                |    |    |
| 3     | 1.0m      | 0          | 1        | 15     | 11   | 73              |                      |                      |                      |    |    |
| 4     | 1.0m      | 14         | 26       | 19     | 16   | 25              |                      | 0.054                | 2.053                |    |    |
| 4     | 2.0m      | 38         | 20       | 22     | 13   | 7               | 0.130                | 1.043                | 4.528                |    |    |



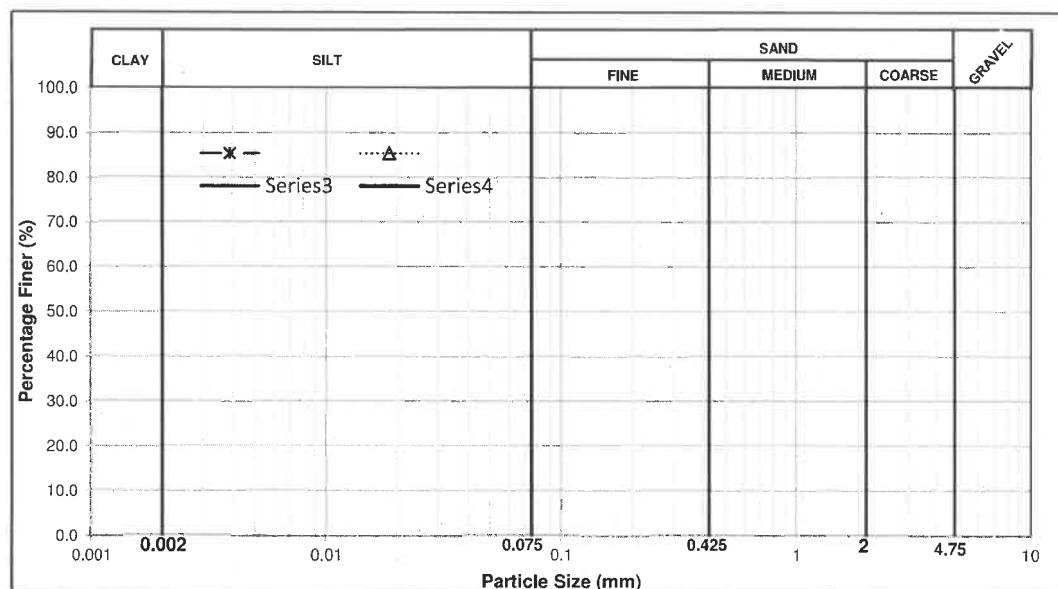
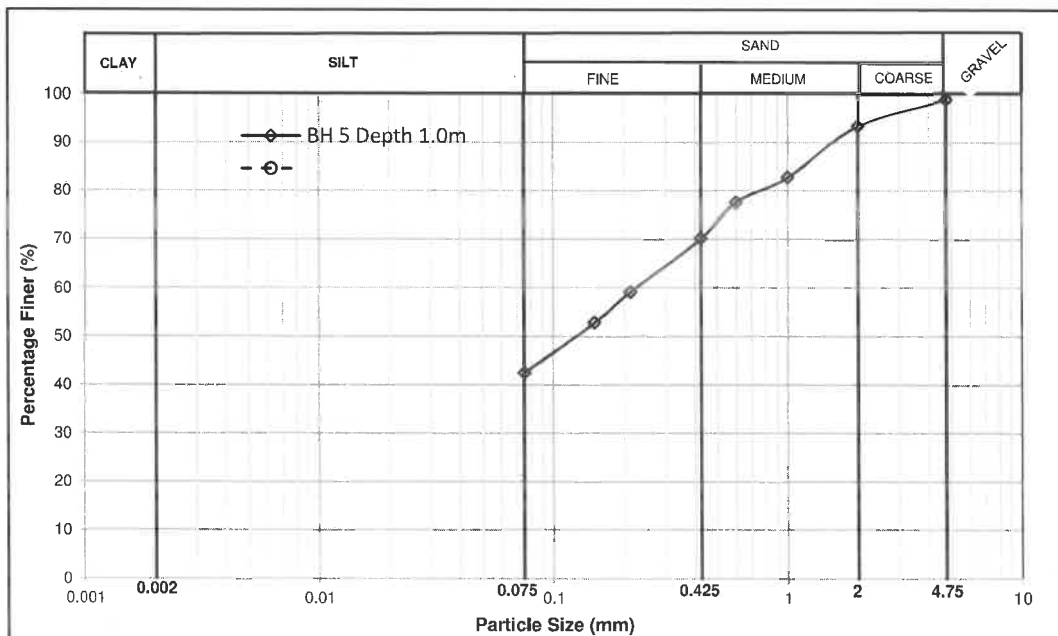
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CERTIFICATE NO.TC-8678

ULR-TC867823100000048F

Project No: MSGTPL/SI-5751-R2/22-23

Project :Proposed Construction of Residential Building (1Basement+S+11)at Padappai

### GRAIN SIZE ANALYSIS

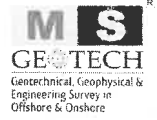


| BH-No | Depth<br>(m) | Gravel<br>(%) | SAND (%) |        |      | SILT & CLAY<br>(%) | D <sub>10</sub><br>(mm) | D <sub>30</sub><br>(mm) | D <sub>60</sub><br>(mm) | Cu | Cc |
|-------|--------------|---------------|----------|--------|------|--------------------|-------------------------|-------------------------|-------------------------|----|----|
|       |              |               | Coarse   | Medium | Fine |                    |                         |                         |                         |    |    |
| 5     | 1.0m         | 1             | 6        | 23     | 28   | 42                 |                         |                         | 0.229                   |    |    |
|       |              |               |          |        |      |                    |                         |                         |                         |    |    |
|       |              |               |          |        |      |                    |                         |                         |                         |    |    |
|       |              |               |          |        |      |                    |                         |                         |                         |    |    |



CERTIFICATE NO.TC-8678

ULR-TC867823100000048F



Geotechnical, Geophysical &  
Engineering Survey in  
Offshore & Onshore

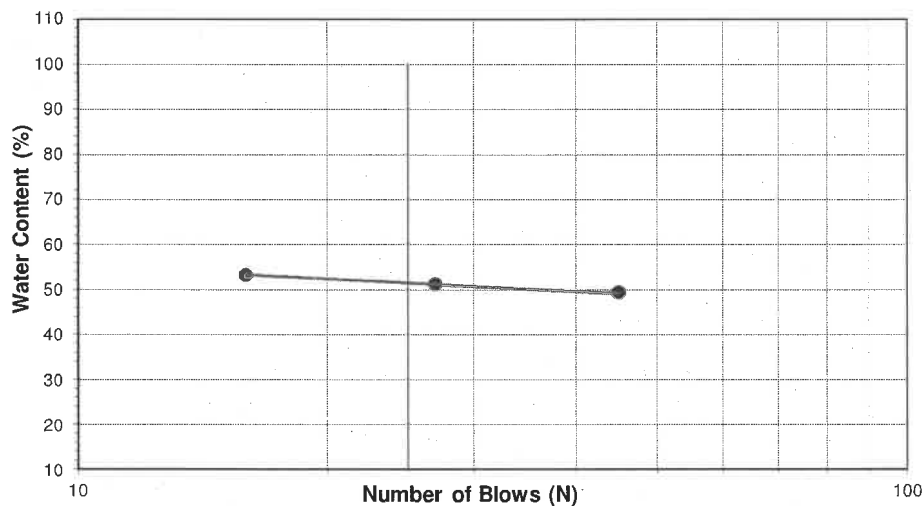
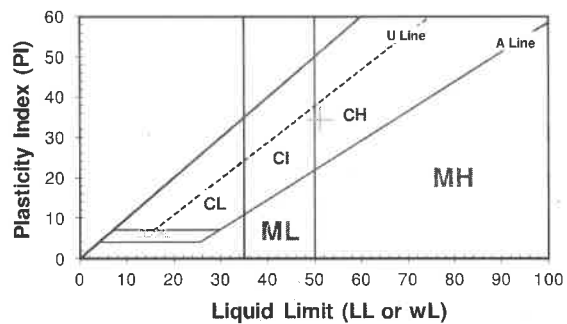
## ATTERBERG LIMITS DATA SHEET

IS-2720-Part-5

|                      |                                       |
|----------------------|---------------------------------------|
| <b>Project :</b>     | Residential Building (1Basement+S+14) |
| <b>Location:</b>     | Padappai                              |
| <b>Boring No:</b>    | BH-3                                  |
| <b>Sample Depth:</b> | 1.0m                                  |
| <b>Project No:</b>   | MSGTPL/SI-5751-R2/22-23               |

| TEST                    |                  |       | LIQUID LIMIT |       |       |  | PLASTIC LIMIT |   |  |  |
|-------------------------|------------------|-------|--------------|-------|-------|--|---------------|---|--|--|
| Variable                | NO               |       | 1            | 2     | 3     |  | 1             | 2 |  |  |
|                         | Var.             | Units |              |       |       |  |               |   |  |  |
| Number of Blows         | N                | blows | 16           | 27    | 45    |  |               |   |  |  |
| Tare Number             | ---              | ---   | 224          | 240   | 201   |  | 145           |   |  |  |
| Weight of Empty Tare    | M <sub>C</sub>   | (g)   | 29.51        | 28.8  | 28.03 |  | 29.64         |   |  |  |
| Wt of Tare + Soil (Wet) | M <sub>CMS</sub> | (g)   | 48.87        | 49.79 | 61.17 |  | 45.82         |   |  |  |
| Wt of Tare + Soil (Dry) | M <sub>CDS</sub> | (g)   | 42.15        | 42.69 | 50.25 |  | 43.51         |   |  |  |
| Weight of Soil          | M <sub>S</sub>   | (g)   | 12.64        | 13.89 | 22.22 |  | 13.87         |   |  |  |
| Weight of Water         | M <sub>W</sub>   | (g)   | 6.72         | 7.10  | 10.92 |  | 2.31          |   |  |  |
| Water Content           | w                | (%)   | 53.2         | 51.1  | 49.1  |  | 16.7          |   |  |  |

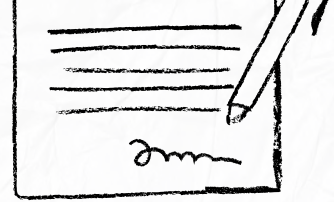
|                                                |    |
|------------------------------------------------|----|
| <b>Liquid Limit (LL or w<sub>L</sub>) (%)</b>  | 51 |
| <b>Plastic Limit (PL or w<sub>P</sub>) (%)</b> | 17 |
| <b>Plasticity Index (PI) (%)</b>               | 34 |
| <b>Soil Classification</b>                     | CH |



.....END OF THE REPORT.....



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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.



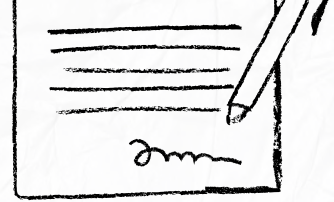
### **NRI & Investment Services**

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



### **Compliance & Special Services**

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



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### **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



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### **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**

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