



# ASSESSMENT REPORT

## PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA (MK12-01815W [PLOT LCK218])

Prepare For



|           |                  |
|-----------|------------------|
| Job No    | : CD/J240106     |
| Report No | : J240106        |
| Revision  | : 00             |
| Date      | : 8 October 2024 |



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### **APPENDICES**

- Appendix A    Legend
- Appendix B    Classification of Soil & Rock Type
- Appendix C    Identification & description of Soil (BS 5930,1999)
- Appendix D    Trial Pit Survey Location for LCK218



## 1 Project Details

Project Title : Provision Of Trial Pits and Sub-Surface Condition Assessment Of Land Parcels At Lim Chu Kang Area

Land Parcel : Lot MK12-01815W (LCK218) at New Tiew Harvest Lane

Job No : CD/J240106

Report No : J240106

Client : **Singapore Food Agency**  
Food Infrastructure Development and Management Division

Address : 52 Jurong Gateway Road #14-01  
JEM Office Tower  
Singapore 608550

Professional Engineer : Er. NG Dick Young

## 2 Introduction

This report covers the trial pit and subsurface condition assessment works carried out on land parcel, under MK12-01815W on 25 September 2024 – 28 September 2024. The land parcels underwent inspection, and underground cable detection works were carried out before commencing the excavating of eight (8) trial pits up to the required dimensions, which were then inspected by the appointed professional engineer. The report includes the findings from the trial pit, the engineer's assessment, and other relevant details related to the assessment work.



Figure 1 Location Of LCK218 Within Lot MK12-01815W At New Tiew Harvest Lane

### 3 Scope of work

#### 3.1 General Information

This project site is located at northwestern part of Singapore, along Neo Tiew Harvest Lane. The project site, including location of the trial pits are shown in Fig 2 on page 7.

The scope of work for trial pits and sub-condition assessments included the following :

- Supply of all labour, equipment, plant, transport and all else necessary for the due and proper completion of trial pits and assessment works.
- Engagement of Registered Surveyor, Professional Engineer (PE), Specialists and etc to survey, inspection, supervision, assessment, report, endorsement, etc. of the trials pits works and sub-surface condition assessment.
- Conducting underground cable detection works by licensed cable detection workers.



- Proposal of trial pits locations for each land parcel by the Professional Engineer with setting out the trial pits coordinates and levels, detection of services and underground elements.
- Provision of proper Earth Control Measures (ECM) at exposed surfaces where necessary.
- Excavation of trial pits with dimensions of 1.5m (length) x 1.5m (width) x 1.5m (depth).
- Carrying out visual inspection and sub-surface condition assessment on the soil profile of the excavated trial pits by the Professional Engineer.
- Preparation and submission of trial pits survey and sub-surface condition assessment report with endorsement by the appointed Professional Engineer.
- Reinstatement work by backfilling and compacting with on-site excavated earth and turf with fresh grass.

### **3.2 Methodology**

The objective of this project is to conduct visual inspections of sub-surface soil within the excavated trial pits and produce a sub-surface condition report. The preliminary site survey was conducted by the field team and underground cable detection works were carried out by the Licensed Cable Detection Worker.

Proposed trial pit locations were proposed by the Professional Engineer and submitted for approval by the client. Safety measures were observed and installed before the commencement of excavation works. The findings were recorded by the engineer and locational details were taken by the surveyor.

## 4 Inspection Photographs and Assessment

### 4.1 Overview Trial Pit Location Within Lot MK12-01815W (LCK218) @ New Tiew Harvest surveyed by Low Lee Luang, Registered surveyor No.56



Figure 2 Overview Trial Pit Location Within Lot MK12-01815W (LCK218)

## 4.2 Soil Photographs & Soil Profile Logs

### 4.2.1 LCK218-TP01 Soil Photographs

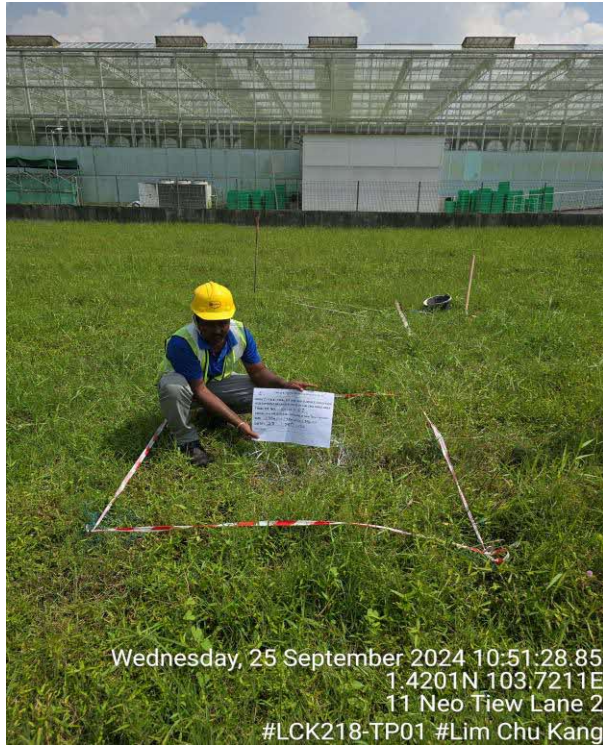


Figure 3.1 Trial Pit location for LCK218-TP01



Figure 3.2 Overview for LCK218-TP01





Figure 3.3 General View of Trial Pit LCK218-TP01

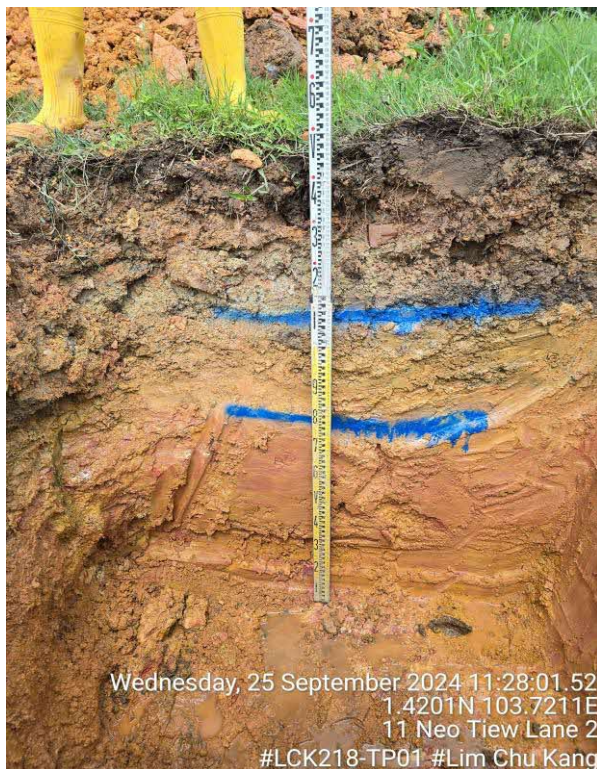


Figure 3.4 Closeup View of Trial Pit LCK218-TP01

**PE's observation for LCK218-TP01:**

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.



## Cables & Utilities Detection Services Pte Ltd

### 4.2.2 LCK218-TP01 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                                 |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                                 |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP01         | SURFACE ELEVATION:                                                                                                 | 104.512                                                         | DATE:                  | 25.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44657.743                                                       |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15511.459                                                       | SHEET NO:              | 1 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                                            | BS Soil Classification | Additional Remarks |
| 104.512                                          | 0.0                 |                                                                                                                    | Turf surface                                                    |                        |                    |
|                                                  | 0.1                 |                                                                                                                    | Stiff, Pale light grey with dark orange, Sandy SILT with gravel | MS                     |                    |
|                                                  | 0.2                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 0.3                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 0.4                 |                                                                                                                    |                                                                 |                        |                    |
| 104.112                                          | 0.4                 |                                                                                                                    | Very stiff, Medium orange, Sandy SILT                           | MS                     |                    |
|                                                  | 0.5                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 0.6                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 0.7                 |                                                                                                                    |                                                                 |                        |                    |
| 103.762                                          | 0.8                 |                                                                                                                    | Firm, Dark orange dappled with pale red, Sandy SILT             | MS                     |                    |
|                                                  | 0.9                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.0                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.1                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.2                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.3                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.4                 |                                                                                                                    |                                                                 |                        |                    |
| 103.012                                          | 1.5                 |                                                                                                                    | TERMINATION DEPTH AT 1.5m<br>BOTTOM OF TRIAL PIT                |                        |                    |
|                                                  | 1.6                 |                                                                                                                    |                                                                 |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                                 |                        |                    |



## 4.2.3 LCK218-TP02 Soil Photographs



Figure 3.5 Trial Pit location for LCK218-TP02



Figure 3.6 Overview for LCK218-TP02

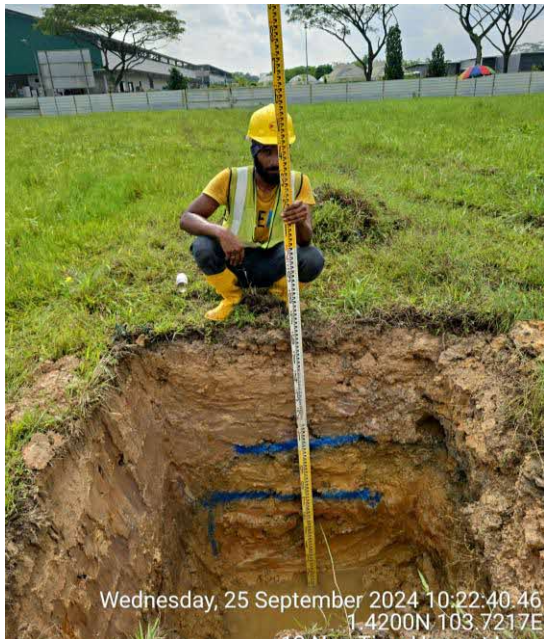


Figure 3.7 General View of Trial Pit LCK218-TP02



Figure 3.8 Closeup View of Trial Pit LCK218-TP02

**PE's observation for LCK218-TP02:**

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.



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### 4.2.4 LCK218-TP02 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                                                    |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                                                    |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP02         | SURFACE ELEVATION:                                                                                                 | 104.584                                                                            | DATE:                  | 25.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44645.073                                                                          |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15580.924                                                                          | SHEET NO:              | 2 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                                                               | BS Soil Classification | Additional Remarks |
| 104.584                                          | 0.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Turf surface                                                                       | MS                     |                    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Firm, Pale light brown with dark orange,<br>Fine to coarse sandy SILT with gravels |                        |                    |
|                                                  | 0.1                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 0.2                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 0.3                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 0.4                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 0.5                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
| 103.984                                          | 0.6                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Stiff, Medium brown, SILT with gravel                                              | M                      |                    |
|                                                  | 0.7                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 0.8                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
| 103.684                                          | 0.9                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Firm, Dark brown mixed with pale dark red                                          | M                      |                    |
|                                                  | 1.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 1.1                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 1.2                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 1.3                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 1.4                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
|                                                  | 1.5                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    |                                                                                    |                        |                    |
| 102.984                                          | 1.6                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | TERMINATION DEPTH AT 1.6m<br>BOTTOM OF TRIAL PIT                                   |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                                                    |                        |                    |



#### 4.2.5 LCK218-TP03 Soil Photographs



Figure 3.9 Trial Pit Location for LCK218-TP03



Figure 3.10 Overview for LCK218-TP03



Figure 3.11 General View of Trial Pit LCK218-TP03



Figure 3.12 Closeup View of Trial Pit LCK218-TP03

## PE's observation for LCK218-TP03:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.



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### 4.2.6 LCK218-TP03 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                                      |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                                      |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP03         | SURFACE ELEVATION                                                                                                  | 104.640                                                              | DATE:                  | 26.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44604.704                                                            |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15577.427                                                            | SHEET NO:              | 3 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                                                 | BS Soil Classification | Additional Remarks |
| 104.640                                          | 0.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Turf surface                                                         |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    | Stiff, Reddish brown, Sandy SILT                                     | MS                     |                    |
|                                                  | 0.1                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.2                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.3                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.4                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.5                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
| 104.040                                          | 0.6                 | · · · · · · · ·                                                                                                    | Stiff, Light purple with medium brown dappled with white, Sandy SILT | MS                     |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.7                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 0.8                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
| 103.740                                          | 0.9                 | · · · · · · · ·                                                                                                    | Firm, Reddish dark grey, Sandy SILT                                  | MS                     |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.0                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.1                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.2                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.3                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.4                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  | 1.5                 | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    |                                                                      |                        |                    |
| 103.040                                          | 1.6                 | · · · · · · · ·                                                                                                    | TERMINATION DEPTH AT 1.6m                                            |                        |                    |
|                                                  |                     |                                                                                                                    | BOTTOM OF TRIAL PIT                                                  |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                                      |                        |                    |



## 4.2.7 LCK218-TP04 Soil Photographs

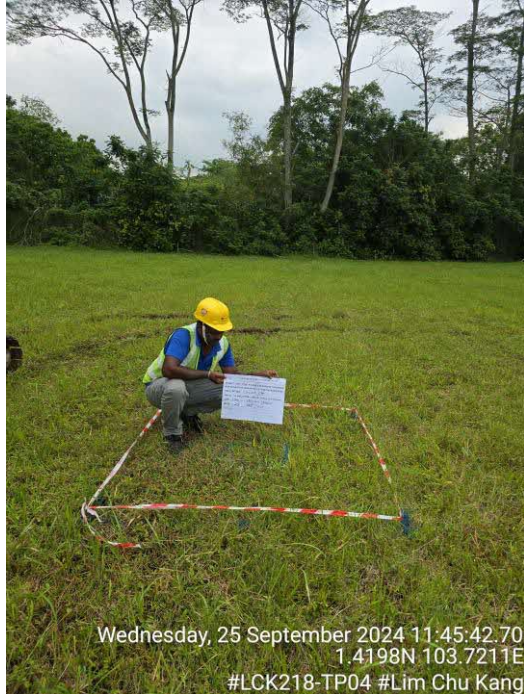


Figure 3.13 Trial Pit Location for LCK218-TP04



Figure 3.14 Overview for LCK218-TP04



Figure 3.15 General View of Trial Pit LCK218-TP04



Figure 3.16 Closeup View of Trial Pit LCK218-TP04

## PE's observation for LCK218-TP04:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.



## Cables & Utilities Detection Services Pte Ltd

### 4.2.8 LCK218-TP04 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                                                   |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                                                   |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP04         | SURFACE ELEVATION:                                                                                                 | 104.587                                                                           | DATE:                  | 25.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44616.210                                                                         |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15513.422                                                                         | SHEET NO:              | 4 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                                                              | BS Soil Classification | Additional Remarks |
| 104.587                                          | 0.0                 | ▼ ▼ ▼ ▼ ▼ ▼ ▼                                                                                                      | Turf surface                                                                      |                        |                    |
|                                                  |                     | • • • • •                                                                                                          | Stiff, Dark brown dappled with pale orange, Fine to coarse sandy SILT with gravel | MS                     |                    |
|                                                  | 0.1                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.2                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.3                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.4                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
| 104.087                                          | 0.5                 | • • • • •                                                                                                          | Stiff, Pale reddish with dark brown dappled with white, Sandy SILT                | MS                     |                    |
|                                                  | 0.6                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.7                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.8                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 0.9                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 1.0                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 1.1                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
| 103.387                                          | 1.2                 | • • • • •                                                                                                          | Loose, Dark grey, Fine silty SAND                                                 | SM                     |                    |
|                                                  | 1.3                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 1.4                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
|                                                  | 1.5                 | • • • • •                                                                                                          |                                                                                   |                        |                    |
| 102.987                                          | 1.6                 | • • • • •                                                                                                          | TERMINATION DEPTH AT 1.6m<br>BOTTOM OF TRIAL PIT                                  |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                                                   |                        |                    |



## 4.2.9 LCK218-TP05 Soil Photographs



Figure 3.17 Trial Pit Location for LCK218-TP05



Figure 3.18 Overview for LCK218-TP05





Figure 3.19 General View of Trial Pit LCK218-TP05



Figure 3.20 Closeup View of Trial Pit LCK218-TP05

## PE's observation for LCK218-TP05:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.



## Cables & Utilities Detection Services Pte Ltd

### 4.2.10 LCK218-TP05 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                   |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                   |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP05         | SURFACE ELEVATION:                                                                                                 | 104.410                                           | DATE:                  | 26.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44574.548                                         |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15515.392                                         | SHEET NO:              | 5 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                              | BS Soil Classification | Additional Remarks |
| 104.410                                          | 0.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Turf surface                                      |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    | Dark orange, Sandy SILT with gravel               | MS                     |                    |
|                                                  | 0.1                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.2                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.3                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.4                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.5                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
| 103.810                                          | 0.6                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    | Soft, light orange dappled with white, Sandy SILT | MS                     |                    |
|                                                  | 0.7                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.8                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 0.9                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 1.0                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 1.1                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  | 1.2                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
| 103.110                                          | 1.3                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
|                                                  |                     | · · · · · · · ·                                                                                                    | Loose, Dark grey, Slightly silty SAND             | SM                     |                    |
|                                                  | 1.4                 | · · · · · · · ·                                                                                                    |                                                   |                        |                    |
| 102.910                                          | 1.5                 | · · · · · · · ·                                                                                                    | TERMINATION DEPTH AT 1.5m<br>BOTTOM OF TRIAL PIT  |                        |                    |
|                                                  | 1.6                 |                                                                                                                    |                                                   |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                   |                        |                    |

## 4.2.11 LCK218-TP06 Soil Photographs



Figure 3.21 Trial Pit Location for LCK218-TP06



Figure 3.22 Overview for LCK218-TP06





Figure 3.23 General View of Trial Pit LCK218-TP06



Figure 3.24 Closeup View of Trial Pit LCK218-TP06

## PE's observation for LCK218-TP06:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.





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|--------------------------------------------------|---------------------|--------------------|--------------------------------------------------------------------------------------------------------------------|------------------------|--------------------|-----------------|--------------------------------|----|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| TRIAL PIT NO:                                    | LCK218-TP06         | SURFACE ELEVATION: | 104.502                                                                                                            | DATE:                  | 26.09.2024         |                 |                                |    |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:          | 44564.297                                                                                                          |                        |                    |                 |                                |    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:           | 15572.683                                                                                                          | SHEET NO:              | 6 of 8             |                 |                                |    |
|                                                  |                     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| Reduced Level (m)                                | Depth (m)           | Graphic Log        | Material Description                                                                                               | BS Soil Classification | Additional Remarks |                 |                                |    |
| 104.502                                          | 0.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    | Turf surface                                                                                                       |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    | Stiff, Dark brown mixed with pale dark purple, Sandy SILT with gravels                                             | MS                     |                    |                 |                                |    |
|                                                  | 0.1                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 0.2                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 0.3                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 0.4                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 0.5                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  |                     | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 103.902             | 0.6                |                                                                                                                    |                        |                    | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ | Stiff, Dark orange, Sandy SILT | MS |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 0.7                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 0.8                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 0.9                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 103.602                                          | 0.9                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    | Stiff, Dark grey mixed with pale orange, Sandy SILT                                                                | MS                     |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 1.0                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 1.1                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 1.2                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 1.3                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 1.4                                              | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓     |                    |                                                                                                                    |                        |                    |                 |                                |    |
| 103.002                                          | 1.5                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓    | TERMINATION DEPTH AT 1.5m                                                                                          |                        |                    |                 |                                |    |
|                                                  |                     |                    | BOTTOM OF TRIAL PIT                                                                                                |                        |                    |                 |                                |    |
|                                                  |                     |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 1.6                 |                    |                                                                                                                    |                        |                    |                 |                                |    |
|                                                  | 1.7                 |                    |                                                                                                                    |                        |                    |                 |                                |    |

#### 4.2.13 LCK218-TP07 Soil Photographs

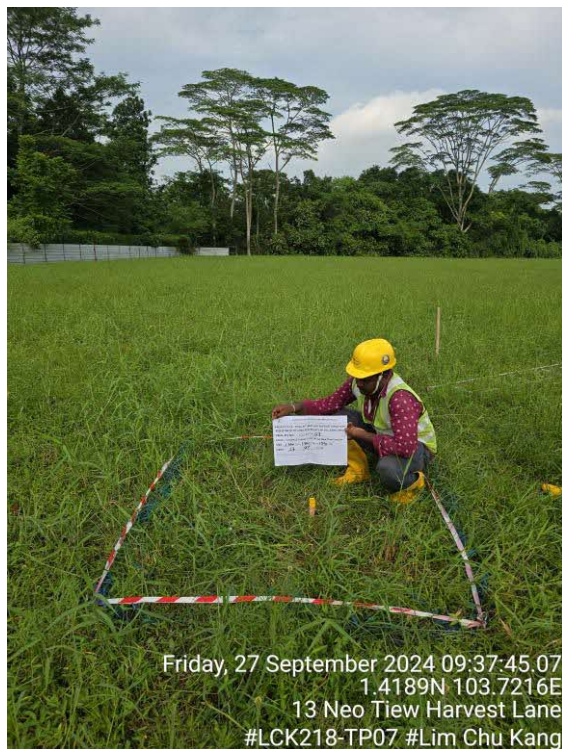


Figure 3.25 Trial Pit Location for LCK218-TP07



Figure 3.26 Overview of Trial Pit LCK218-TP07





Figure 3.27 General View of Trial Pit LCK218-TP07



Figure 3.28 Closeup View of Trial Pit LCK218-TP07

## PE's observation for LCK218-TP07:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit.





## Cables & Utilities Detection Services Pte Ltd

### 4.2.14 LCK218-TP07 Soil Profile Logs

| CABLES & UTILITIES DETECTION SERVICES<br>PTE LTD |                     | PROJECT : PROVISION OF TRIAL PITS AND SUB-SURFACE CONDITION<br>FOR ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA |                                                                                       |                        |                    |
|--------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                                                                                                                    |                                                                                       |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP07         | SURFACE ELEVATION:                                                                                                 | 104.431                                                                               | DATE:                  | 27.09.2024         |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:                                                                                                          | 44524.250                                                                             |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:                                                                                                           | 15568.941                                                                             | SHEET NO:              | 7 of 8             |
| Reduced Level (m)                                | Depth (m)           | Graphic Log                                                                                                        | Material Description                                                                  | BS Soil Classification | Additional Remarks |
| 104.431                                          | 0.0                 | ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓                                                                                                    | Turf surface                                                                          |                        |                    |
|                                                  | 0.1                 | · · · · · · · ·                                                                                                    | Firm, Dark brown with dark grey dappled with white, Sandy SILT with gravels           | MS                     |                    |
|                                                  | 0.2                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.3                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
| 104.081                                          |                     |                                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.4                 | · · · · · · · ·                                                                                                    | Stiff, Light orange with pale dark purple dappled with white, Sandy SILT with gravels | MS                     |                    |
|                                                  | 0.5                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.6                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.7                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.8                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  | 0.9                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
| 103.431                                          | 1.0                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  |                     |                                                                                                                    |                                                                                       |                        |                    |
|                                                  | 1.1                 | · · · · · · · ·                                                                                                    | Loose, Dark grey, Slightly silty SAND                                                 | SM                     |                    |
|                                                  | 1.2                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
| 103.131                                          | 1.3                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
|                                                  |                     |                                                                                                                    |                                                                                       |                        |                    |
|                                                  | 1.4                 | · · · · · · · ·                                                                                                    | Stiff, Dark grey dappled with light grey, Fine sandy SILT                             | MS                     |                    |
|                                                  | 1.5                 | · · · · · · · ·                                                                                                    |                                                                                       |                        |                    |
| 102.831                                          | 1.6                 | · · · · · · · ·                                                                                                    | TERMINATION DEPTH AT 1.6m                                                             |                        |                    |
|                                                  |                     |                                                                                                                    | BOTTOM OF TRIAL PIT                                                                   |                        |                    |
|                                                  | 1.7                 |                                                                                                                    |                                                                                       |                        |                    |

## 4.2.15 LCK218-TP08 Soil Photographs



Figure 3.29 Trial Pit Location for LCK218-TP08



Figure 3.30 Overview for LCK218-TP08





Figure 3.31 General View of Trial Pit LCK218-TP08



Figure 3.32 Closeup View of Trial Pit LCK218-TP08

## PE's observation for LCK218-TP08:

The soil profile is topped with existing grass turf. There is visible porosity, and the soil is moist, consisting of a mixture of silt, sand, and gravel, with water present in the trial pit, requiring a water pump to remove it.





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|--------------------------------------------------|---------------------|--------------------|--|--------------------------------------------------------------------------------------------------------------------|-----------|------------------------|--------------------|
| CLIENT: SINGAPORE FOOD AGENCY                    |                     |                    |  |                                                                                                                    |           |                        |                    |
| TRIAL PIT NO:                                    | LCK218-TP08         | SURFACE ELEVATION: |  | 104.301                                                                                                            | DATE:     | 27.09.2024             |                    |
| TRIAL PIT DIMENSION:                             | 1.5m (L) x 1.5m (W) | NORTHING:          |  | 44534.451                                                                                                          |           |                        |                    |
| EXCAVATION METHOD:                               | MANUAL & MECHANICAL | EASTING:           |  | 15516.933                                                                                                          | SHEET NO: | 8 of 8                 |                    |
|                                                  |                     |                    |  |                                                                                                                    |           |                        |                    |
| Reduced Level (m)                                | Depth (m)           | Graphic Log        |  | Material Description                                                                                               |           | BS Soil Classification | Additional Remarks |
| 104.301                                          | 0.0                 | ▽ ▽ ▽ ▽ ▽ ▽ ▽      |  | Turf surface                                                                                                       |           |                        |                    |
|                                                  |                     | * * * * *          |  | Stiff, Light brown with orange, Fine sandy SILT                                                                    |           | MS                     |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.1                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.2                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.3                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.4                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 0.5                                              | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 0.6                                              | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 103.701                                          | 0.6                 | * * * * *          |  | Soft, Dark grey with pale brown, Fine sandy SILT                                                                   |           | MS                     |                    |
|                                                  |                     | * * * * *          |  | Soft, Medium brown with pale light grey, Fine sandy SILT                                                           |           | MS                     |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.7                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.8                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 0.9                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.0                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 1.1                                              | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 1.2                                              | * * * * *           |                    |  |                                                                                                                    |           |                        |                    |
| 103.101                                          | 1.2                 | * * * * *          |  | Soft, Medium brown with pale light grey, Fine sandy SILT                                                           |           | MS                     |                    |
|                                                  |                     | * * * * *          |  | TERMINATION DEPTH AT 1.6m<br>BOTTOM OF TRIAL PIT                                                                   |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.3                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.4                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.5                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  |                     | * * * * *          |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.6                 | * * * * *          |  |                                                                                                                    |           |                        |                    |
| 102.701                                          | 1.6                 | * * * * *          |  | TERMINATION DEPTH AT 1.6m<br>BOTTOM OF TRIAL PIT                                                                   |           |                        |                    |
|                                                  |                     |                    |  |                                                                                                                    |           |                        |                    |
|                                                  | 1.7                 |                    |  |                                                                                                                    |           |                        |                    |



### 5 Conclusion

From the visual inspection of the excavated trial pits within parcel LCK218 at New Tiew Crescent, the general soil composition to a depth of 1.5 meters consists of sandy silt with varying textures, including gravel in the top layer up to 0.2 meters. No suspected backfill areas were identified.

The surface layer in all eight trial pits is covered with grass turfing. The subsoil includes partially decayed organic matter, followed by uniform layers of dark orange dappled with pale red, pale light grey mixed with dark orange, medium orange, dark brown with pale dark red, medium brown, and pale light brown with dark orange. Water was encountered in the trial pits, necessitating the use of a pump for removal. It is suspected that the water may originate from surface runoff, as the trial pits were excavated during the rainy season, albeit at night, with water observed during daytime excavation.

In conclusion, no subsurface water was detected in any of the eight excavated trial pits.

All field inspections were conducted by the Professional Engineer or under his supervision. The recorded results were verified to the best of his knowledge and presented in this report. All the works conducted were in compliance with all aspects of the Building Control Act and Regulations, relevant Codes of Practice, and Standards.

  
Professional Engineer's Signature and Stamp

**08-Oct-2024**

Date



## **Appendix A**

### **Legend**



## LEGENDS FOR DIFFERENT SOIL AND ROCK TYPES

### HATCHING PATTERNS FOR GEOLOGICAL FORMATION CLASSIFICATION

 FILL

#### KALLANG FORMATION

 F1 : FLUVIAL SAND

 F2 : FLUVIAL CLAY

 E : PEAT/ORGANIC CLAY

 M : MARINE CLAY

 Kr : REEF MEMBER

 B : BEACH (LITTORAL)

#### OLD ALLUVIUM

 O(A)

 O(D)

 O(B)

 O(E)

 O(C)

#### JURONG FORMATION

 S(I)

 S(IV)

 S(II)

 S(V)

 S(III)

 S(VI)

#### BUKIT TIMAH GRANITE

 G(I)

 G(IV)

 G(II)

 G(V)

 G(III)

 G(VI)

#### FORT CANNING BOULDER BED

 FCBB

### HATCHING PATTERNS FOR SOIL CLASSIFICATION (BORELOGS)

 AS : ASPHALT, TAR

 BF : BACKFILL

 BE : BEDROCK

 BR : BRICK

 BO : BOULDER

 C : CLAY / MARINE CLAY

 CO : ORGANIC CLAY

 CS : SANDY CLAY

 CG : GRAVELY CLAY

 Cpt : PEATY CLAY

 CNG : CONGLOMERATE

 CON : CONCRETE

 GM : SILTY GRAVEL

 G : GRAVEL

 GS : SANDY GRAVEL

 Gpt : PEATY GRAVEL

 GC : CLAYEY GRAVEL

 GR : GRANITE

 GO : ORGANIC GRAVEL

 LI : LIMESTONE

 M : SILT

 MPt : PEATY SILT

 MG : GRAVELLY SILT

 MU : MUDSTONE

 MS : SANDY SILT

 MO : ORGANIC SILT

 Pt : PEAT

 Pts : SANDY PEAT

 PtG : GRAVELLY PEAT

 PtM : SILTY PEAT

 Ptc : CLAYEY PEAT

 S : SAND

 SG : GRAVELLY SAND

 SO : ORGANIC SAND

 SM : SILTY SAND

 SC : CLAYEY SAND

 SPt : PEATY SAND

 SA : SANDSTONE

 SI : SILTSTONE

 SH : SHALE

 SCH : SCHIST

 TB : TIMBER

 Rf : REEF



## **Appendix B**

### **Classification of Soil & Rock Type**

| REFERENCE | SOIL & ROCK TYPE                                                          | GENERAL DESCRIPTION                                                                                                                                                                                          | GEOLOGICAL FORMATION (PWD, 1976)                                                                                           |
|-----------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| B         | BEACH (Littoral)                                                          | Sandy, sometimes silty, with gravels, coral and shells                                                                                                                                                       | KALLANG Littoral, possibly also part of all other members & TEKONG                                                         |
| E         | ESTUARINE (Transitional)                                                  | Peats, peaty and organic clays, organic sands                                                                                                                                                                | KALLANG Transitional, possibly part of Alluvial and Marine.                                                                |
| F         | FLUVIAL (Alluvial)                                                        | Sands, silty sands, silts and clays                                                                                                                                                                          | KALLANG Alluvial, possibly part of all other members and TEKONG.                                                           |
| F1        |                                                                           | Predominantly granular soils including silty sands, clayey sands and sandy silts                                                                                                                             | Bed of Alluvial Member of KALLANG                                                                                          |
| F2        |                                                                           | Cohesive soils including silty clays, sandy clays and clayey silts                                                                                                                                           | Bed of Alluvial Member of KALLANG                                                                                          |
| M         | MARINE                                                                    | Very soft to soft blue or grey clay                                                                                                                                                                          | KALLANG Marine Member                                                                                                      |
| O         | OLD ALLUVIUM                                                              | Very weak to weak beds of sandstone and mudstone. See C-5 for weathering classification                                                                                                                      | OLD ALLUVIUM                                                                                                               |
| FC        | FORT CANNING BOULDER BED (also known as S3, Bouldery Clay or Boulder Bed) | A colluvial deposit of boulders in a soil matrix. The matrix is typically a hard silty clay, but can be granular. The material is largely derived from the rocks and weathered rocks of the Jurong Formation | Not shown in PWD (1976)                                                                                                    |
| S         | SEDIMENTARIE S (Rocks & associated soils)                                 | Sandstones, siltstones mudstones, conglomerate and limestone. The rock has been subjected to a varying degree of metamorphism.                                                                               | JURONG Tengah, Rimau, Ayer Chawan and Queenstown Facies (plus the Pandan Limestone, which was not identified in PWD (1976) |
| G         | GRANITE (Rock and associated Residual soils)                              | Granitic rocks, including granodiorite, adamellite and granite.                                                                                                                                              | BUKIT TIMAH GRANITE                                                                                                        |





## **Appendix C**

### **Identification & description of Soil (BS 5930,1999)**

| Soil group                                             | Density/compactness/strength             |                                                                     | Discontinuities                                                                                                   |                                                      | Bedding                       |                     | Colour                                            | Composite Soil types (mixtures of basic soil types)   |                                                                                                                                                                              | Principle Shape                                                    | Particle size                   | PRINCIPAL SOIL TYPE |                      |            |
|--------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------|---------------------|---------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------|---------------------|----------------------|------------|
|                                                        | Term                                     | Field test                                                          |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Very coarse soils                                      | Loose                                    | By inspection of voids and particle packing                         | Scale of spacing of discontinuities                                                                               |                                                      | Scale of bedding thickness    |                     | Red                                               | For mixtures involving very coarse soil, see 41.4.4.3 |                                                                                                                                                                              | Angular                                                            | 200                             | BOULDER             |                      |            |
|                                                        | Dense                                    |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 | Term                | Mean Spacing mm      | Term       |
| Coarse soils<br>(over about 65% sand and gravel sizes) | Borehole with SPT N-value                |                                                                     | Very widely                                                                                                       | Over 2000                                            | Very Thickly Bedded           | Over 2000           | Yellow                                            | Slightly (sandy <sup>a)</sup> )                       | <5                                                                                                                                                                           | Sub rounded                                                        | 60                              | GRAVEL              |                      |            |
|                                                        | Very loose                               | 0-4                                                                 | Widely                                                                                                            | 2000 to 600                                          | Thickly Bedded                | 2000 to 600         | Brown                                             |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Loose                                    | 4-10                                                                | Medium                                                                                                            | 600 to 200                                           | Medium Bedded                 | 600 to 200          | Blue                                              | (sandy <sup>a)</sup> )                                | 5 to 20 <sup>b)</sup>                                                                                                                                                        | Rounded                                                            | 20                              |                     | Medium               |            |
|                                                        | Medium dense                             | 10-30                                                               | Closely                                                                                                           | 200 to 60                                            | Thinly Bedded                 | 200 to 60           | White                                             |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Dense                                    | 30-50                                                               | Very Closely                                                                                                      | 60 to 20                                             | Very thinly Bedded            | 60 to 20            | Cream                                             | Very <sup>a)</sup> (sandy <sup>a)</sup> )             | >20 <sup>b)</sup>                                                                                                                                                            | Minor Constituent type                                             | 6                               |                     | Fine                 |            |
|                                                        | Very dense                               | >50                                                                 | Extremely Closely                                                                                                 | Under 20                                             | Thickly Laminated             | 20 to 6             | Gray                                              |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Slightly cemented                        | Visual examination: pick removes soil in lumps which can be abraded | Fissured                                                                                                          | Break into blocks along unpolished discontinuities   | Thinly laminated              | Under 6             | Black etc.                                        | SAND AND GRAVEL                                       | about 50 <sup>b)</sup>                                                                                                                                                       | Calcareous shelly, glauconitic, micaceous etc. using terms shch as | 2                               | Coarse              | SAND                 |            |
|                                                        | Uncompact                                | Easily moulded or crushed in the fingers                            |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      | Sheared    |
|                                                        | Compact                                  | Can be moduled or curshed by strong pressure in the fingers         | Spacing terms also used for distant between partings, isolated beds or laminae, dessication cracks, rootlets etc. | Inter-Laminated                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Very soft 0-20                           | Finger easily pushed in up to 25mm                                  |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Soft 20-40                                             | Finger pushed in up to 10mm              |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Firm 40-75                                             | Thumb makes impression easily            |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Stiff 75-150                                           | Can be indented slightly by thumb        |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Very stiff 150-300                                     | Can be indented by thumb nail            |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Hard (or very weak mudstone) Cu>300kPa                 | Can be scratched by thumbnail see 41.2.2 |                                                                     |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Fine Soils<br>(over about 35 % silt and clay sizes)    | Uncompact                                | Easily moulded or crushed in the fingers                            |                                                                                                                   |                                                      |                               | Sheared             | Breaks into blocks along polished discontinuities | Inter-bedded                                          | Alternating layers of different types Prequalified by thickness term if in equal proportions. Otherwise thickness of and spacing between subordinate layers defined          | Light                                                              | Slightly (sandy <sup>e)</sup> ) | <35                 | Slightly calcareous, | 0.02       |
|                                                        | Compact                                  | Can be moduled or curshed by strong pressure in the fingers         |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Very soft 0-20                           | Finger easily pushed in up to 25mm                                  | Spacing terms also used for distant between partings, isolated beds or laminae, dessication cracks, rootlets etc. | Inter-Laminated                                      |                               |                     | Dark                                              | (sandy <sup>e)</sup> )                                | 35 to 65 <sup>a)</sup>                                                                                                                                                       | Calcareous                                                         | very calcareous                 | 0.006               | Fine                 | CLAY/ SILT |
|                                                        | Soft 20-40                               | Finger pushed in up to 10mm                                         |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Firm 40-75                               | Thumb makes impression easily                                       |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Stiff 75-150                             | Can be indented slightly by thumb                                   |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Very stiff 150-300                       | Can be indented by thumb nail                                       |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Hard (or very weak mudstone) Cu>300kPa   | Can be scratched by thumbnail see 41.2.2                            |                                                                                                                   |                                                      |                               |                     |                                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
| Organic Soil                                           | Firm                                     | Fibres already compressed together                                  | Fibrous                                                                                                           | Plant remains recognizable and retains some strength | Transported mixtures          |                     | Colour                                            |                                                       | Contains finely divided or discrete particles of organic matter, often with distinctive smell, may oxidize rapidly. Describe as for inorganic soils using terminology above. |                                                                    |                                 |                     |                      |            |
|                                                        | Spongy                                   | Very compressible and open structure                                | Pseudo-Fibrous                                                                                                    | Plant remains recognizable, Strength lost            | Slightly organic clay or silt |                     | Grey as mineral                                   |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        |                                          |                                                                     |                                                                                                                   |                                                      | Organic clay or silt          |                     | Dark gray                                         |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        |                                          |                                                                     |                                                                                                                   |                                                      | Organic sand                  |                     | Dark gray                                         |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        | Plastic                                  | Can be moulded in hand and smears fingers                           | Amorphous                                                                                                         | Recognizable plant remains absent                    | Very organic clay or silt     |                     | Black                                             |                                                       | Predominantly plant remains, usually dark brown or black in colour, distinctive smell, low bulk density. Can contain disseminated or discrete mineral soils.                 |                                                                    |                                 |                     |                      |            |
|                                                        |                                          |                                                                     |                                                                                                                   |                                                      | Very organic sand             |                     | Black                                             |                                                       |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |
|                                                        |                                          |                                                                     |                                                                                                                   |                                                      |                               | Accumulated in situ |                                                   | Peat                                                  |                                                                                                                                                                              |                                                                    |                                 |                     |                      |            |

| PRINCIPAL SOIL TYPE | Visual identification                                                                                                                                                                                                                                                                | Minor constituents                                                                                                                                                                                                                                                                             | Stratum name                                          | Example descriptions                                                                                                                                     |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| BOULDERS            | Only seen complete in pits or exposures                                                                                                                                                                                                                                              | Shell fragments, pockets of peal, gypsum crystals, flint gravel, fragments of brick, rootlets, plastic bags etc<br><br>using terms such as;<br><br>with rare<br><br>with occasional<br><br>with abundant/frequent/ numerous<br><br>%defined on a site or material specific basis or subjective | RECENT DEPOSITS,<br><br>ALLUVIUM,                     | Loose brown very sandy sub-angular fine to coarse flint GRAVEL with small pockets(up to 30mm)of clay. (TERRACE GRAVELS)                                  |
| COBBLES             | Often difficult to recover whole from boreholes                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |                                                       |                                                                                                                                                          |
| GRAVEL              | Easily visible to naked eye: particle shape can be described: grading can be described.                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                | WEATHERED BRACKLESHAM CLAY,                           | Medium dense light brown gravelly clayey fine SAND, Gravel is fine (GLACIAL DEPOSITS)                                                                    |
| SAND                | Visible to naked eye: no cohesion when dry: grading can be described.                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                |                                                       |                                                                                                                                                          |
| SILT                | Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy: slightly granular or silky to the touch; disintegrates in water; lumps dry quickly; possesses cohesion but can be powdered easily between fingers                                          |                                                                                                                                                                                                                                                                                                | LIAS CLAY,                                            |                                                                                                                                                          |
| CLAY/SILT           | Intermediate in behaviour between clay and silt. Slightly dilatant                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                | EMBANKMENT FILL,                                      | Stiff very closely sheared orange mottled brown slightly gravelly CLAY. Gravel is fine and medium of rounded quartzite. (REWORKED WEATHERED LONDON CLAY) |
| CLAY                | Dry lumps can be broken but not powdered between the fingers; they also disintegrate under water but more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying usually showing cracks. |                                                                                                                                                                                                                                                                                                | TOPSOIL,<br><br>MADE GROUND OR GLACIAL DEPOSITS? etc. |                                                                                                                                                          |
|                     |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |                                                       | Firm thinly laminated grey CLAY with closely spaced thick laminae of sand (ALLUVIUM)                                                                     |
|                     |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |                                                       | Plastic brown clayey amorphous PEAT (RECENT DEPOSITS)                                                                                                    |

Notes

a) Or described as coarse soil depending on mass behaviour

d) Gravelly sandy and/or silty or clayey

b) Or described as fine soil depending on mass behaviour

e) Gravelly and/ or sandy

c) %coarse or fine soil type assessed excluding cobbles and boulders

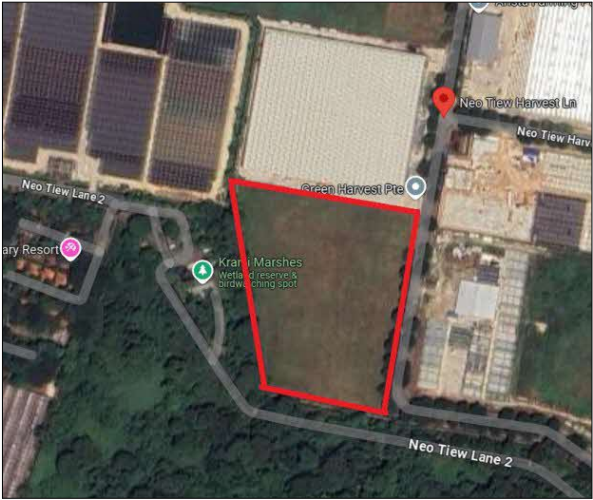
f) Gravelly of sandy



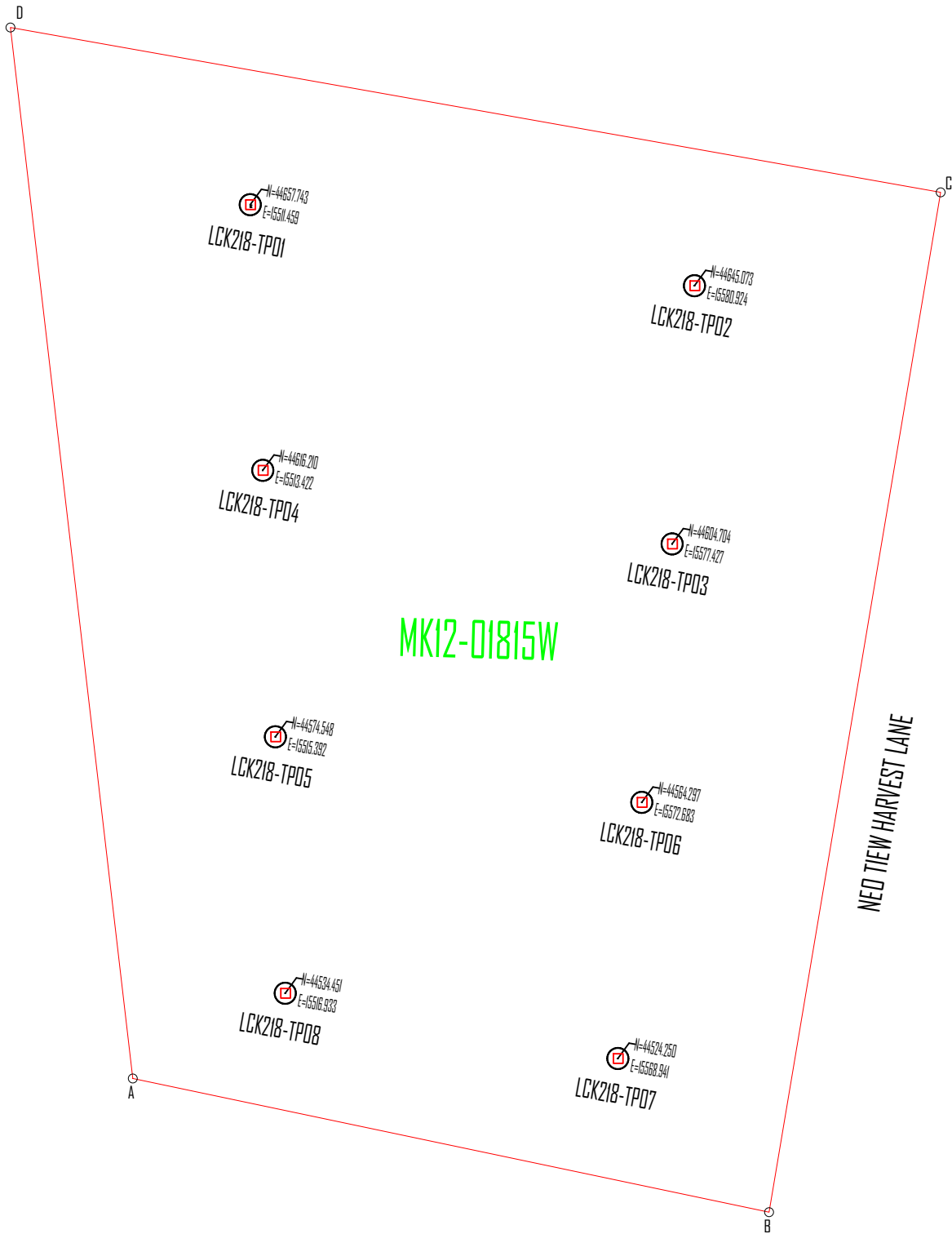
## **Appendix D**

### **Trial Pit Survey Location for LCK218**





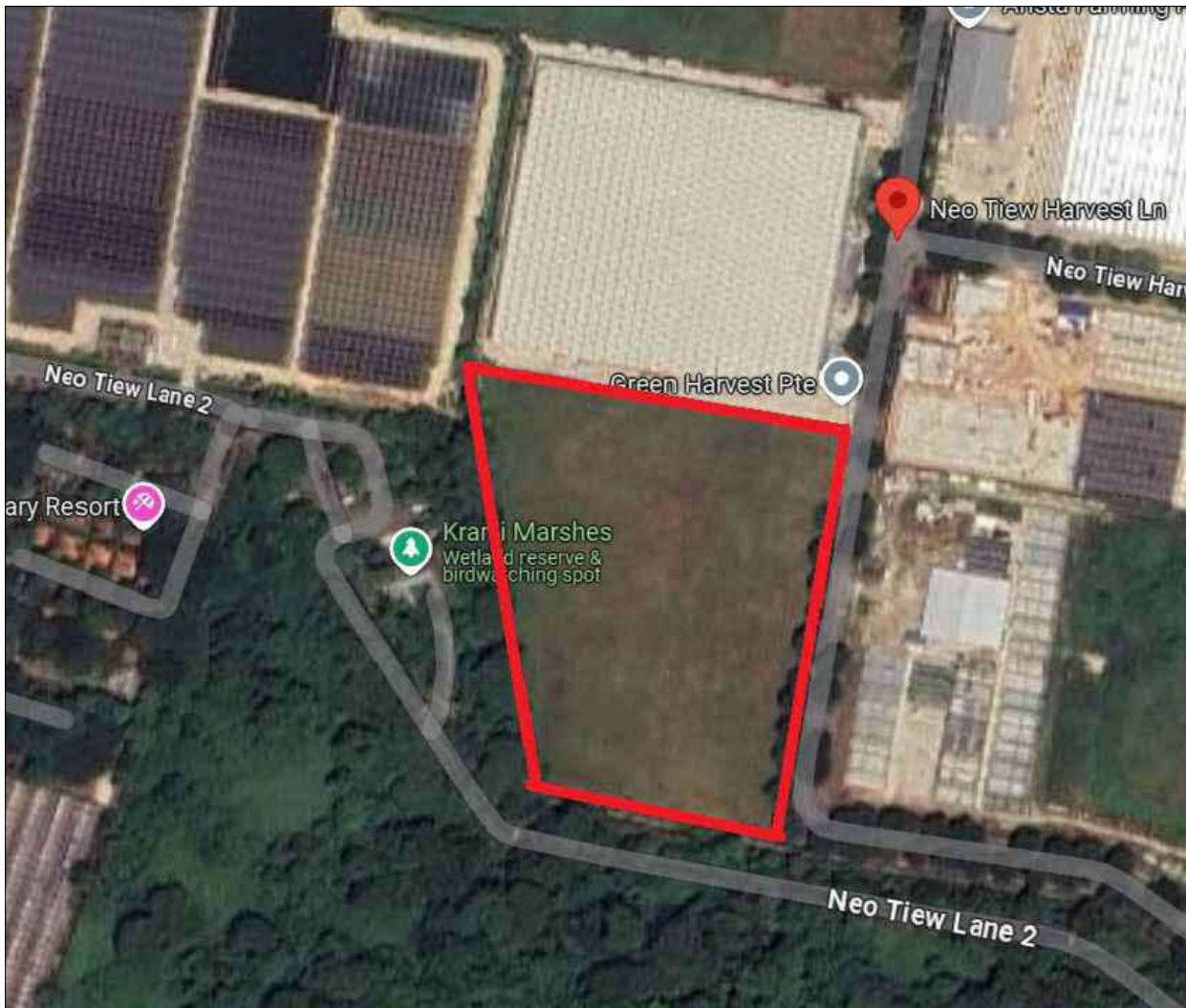
SITE MAP



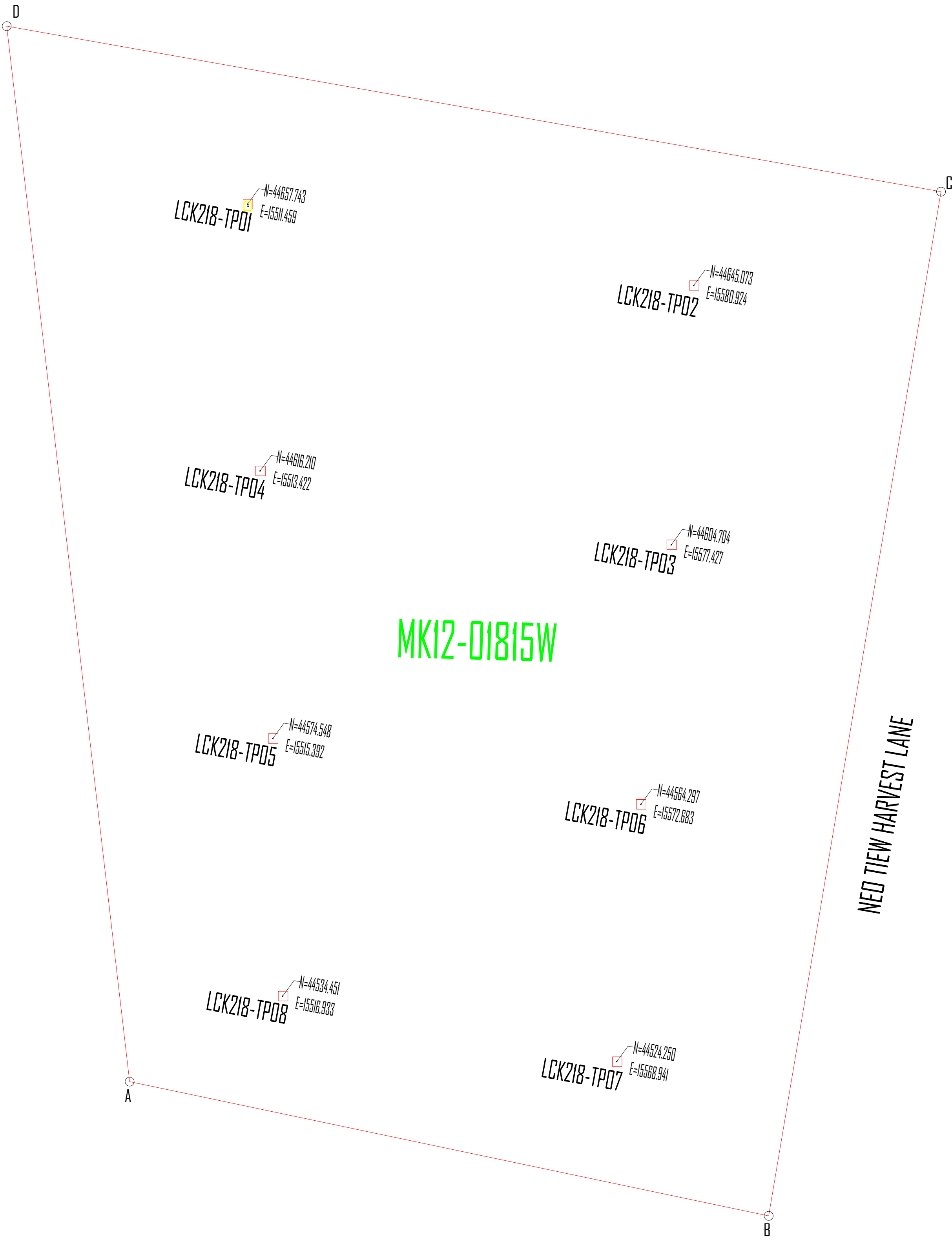
| LOT 01815W |           |           |
|------------|-----------|-----------|
| No.        | NORTHING  | EASTING   |
| A          | 45521.126 | 15493.097 |
| B          | 44500.222 | 15592.585 |
| C          | 47382.005 | 15619.413 |
| D          | 44685.442 | 15473.964 |

| Trial Pit (TP) |           |           |
|----------------|-----------|-----------|
| No.            | NORTHING  | EASTING   |
| 01             | 44657.743 | 15511.459 |
| 02             | 44645.073 | 15580.924 |
| 03             | 44604.704 | 15577.427 |
| 04             | 44616.210 | 15513.422 |
| 05             | 44574.548 | 15515.392 |
| 06             | 44564.297 | 15572.683 |
| 07             | 44524.250 | 15568.941 |
| 08             | 44534.451 | 15516.933 |

|                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                        |                               |                                                                                 |                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Client:</b><br>SINGAPORE FOOD AGENCY                                                                                                                       | <p>1. This drawing must be read together with the cable detection report, PowerGrid, Singtel, StarHub, SCV Cable, PUB, Water, Power Gas, PUB Sewer route drawings or relevant authorities drawings and/or any other instructions or drawing in its full entirety. You are to comply with all PowerGrid, Singtel, StarHub, SCV Cable or relevant authorities submissions, eg NCE and instructions. You are also to comply with all instructions in our cable detection report.</p> <p>2. While every attempt is made to detect all cables, some cables might remain undetected under adverse conditions and weak signals. Should any undetected cable be damaged, your company shall and agrees to bear the full cost of repair.</p> <p>3. Please don't carry out any piling, soil drilling, sinking of earth rods without consulting us or the relevant authorities.</p> <p>4. We will not be able to confirm any services not indicated or provided for in the services routes plans given by the relevant authorities.</p> <p>5. All detections are approximate &amp; subject to confirmation by trial trenches/trial holes.</p> | <b>Legend</b><br>PROPOSED TRIAL PIT (TP) (150mm/50m)                                                   |                               | <b>Acknowledgement</b><br>(Signature & Company Stamp)                           |                                                                                             |
| <b>Project Title:</b><br>TRIAL PIT AND SUB-SURFACE CONDITION ASSESSMENT OF LAND PARCELS AT LIM CHU KANG AREA (LCK218)                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                        |                               |                                                                                 |                                                                                             |
| <b>Drawing Title:</b> CABLE DETECTION DRAWING<br><b>Job No:</b> CD/J2401005<br><b>Reference NO:</b> C202425063<br><b>Date of drawing received:</b> 16-08-2024 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                        |                               |                                                                                 |                                                                                             |
|                                                                                                                                                               | <b>Cables &amp; Utilities Detection Services Pte Ltd</b><br>No. 33 Ubi Ave 3, #05-37, Vertex (Tower A) Singapore 408868<br>Tel: 62692005 Fax: 6269 1955 Email: admin@cabledetection.com.sg url: www.cabledetection.com.sg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Dimension</b> : Meter<br><b>Revision</b> : 00<br><b>Scale</b> : NTS<br><b>Drawing No</b> : 01 of 01 | <b>AREA OF DETECTION:</b><br> | <b>License No</b> : 2021-1042 / 000418<br><b>Date of Detection</b> : 10-09-2024 | <b>Name:</b><br><b>Company:</b><br><b>Designation:</b><br><b>Principal:</b><br><b>Date:</b> |



SITE MAP



| Trial Pit (TP) |           |           |         |
|----------------|-----------|-----------|---------|
| No.            | NORTHING  | EASTING   | LEVEL   |
| 01             | 44657.743 | 15511.459 | 104.512 |
| 02             | 44645.073 | 15580.924 | 104.584 |
| 03             | 44604.704 | 15577.427 | 104.640 |
| 04             | 44616.210 | 15513.422 | 104.587 |
| 05             | 44574.548 | 15515.392 | 104.410 |
| 06             | 44564.297 | 15572.683 | 104.502 |
| 07             | 44524.250 | 15568.941 | 104.431 |
| 08             | 44534.451 | 15516.933 | 104.301 |