



# Geotechnical Site Investigation

BAPS Hindu Mahā-Mandir, Melbourne
1390 – 1450 Western Port Highway, Cranbourne South

G5276.1 AE
22 April 2026
BAPS SWAMINARAYAN SANSTHA, AUSTRALIA LTD

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## PROJECT DETAILS

| | | | |
|---|---|---|---|
| Project Reference | G5276.1 | Rev | AE |
| Project Title | BAPS Hindu Mahā-Mandir, Melbourne | | |
| Project Location | 1390 – 1450 Western Port Highway, Cranbourne South, Victoria | | |
| Date | 22 April 2026 | | |

## CLIENT DETAILS

| | |
|---|---|
| Prepared For (Client) | BAPS Swaminarayan Sanstha, Australia Ltd |

## DISTRIBUTION

| | |
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| Original Held By | Ground Science Pty Ltd |
| One (1) Electronic Copy | BAPS Swaminarayan Sanstha, Australia Ltd |

This document presents the results of the geotechnical site investigation conducted for the aforementioned project and is detailed for the sole use of the intended recipient(s). Should you have any questions related to this report please do not hesitate to contact the undersigned.

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## APPENDICES

## 1. INTRODUCTION

Ground Science has prepared this report to present the results of a geotechnical investigation carried out for the proposed BAPS Hindu Mahã-Mandir, Melbourne at 1390 – 1450 Western Port Highway, Cranbourne South (the site). The scope of works herein was commissioned by BAPS Swaminarayan Sanstha, Australia Ltd by acceptance of our proposal GSP2024274 AA, dated 15 August 2024.

## 2. PROJECT UNDERSTANDING

Based on the latest preliminary architectural drawings prepared by Peddle Thorp Architects (Project No: 3-24-0043 dated April 2026), we understand the project involves the development as a Place of Worship which includes the construction of several buildings, water storage assets, gardens, internal access roads, car parking spaces, wetland and other associated services. The proposed development plan is presented in Figure 1 below.

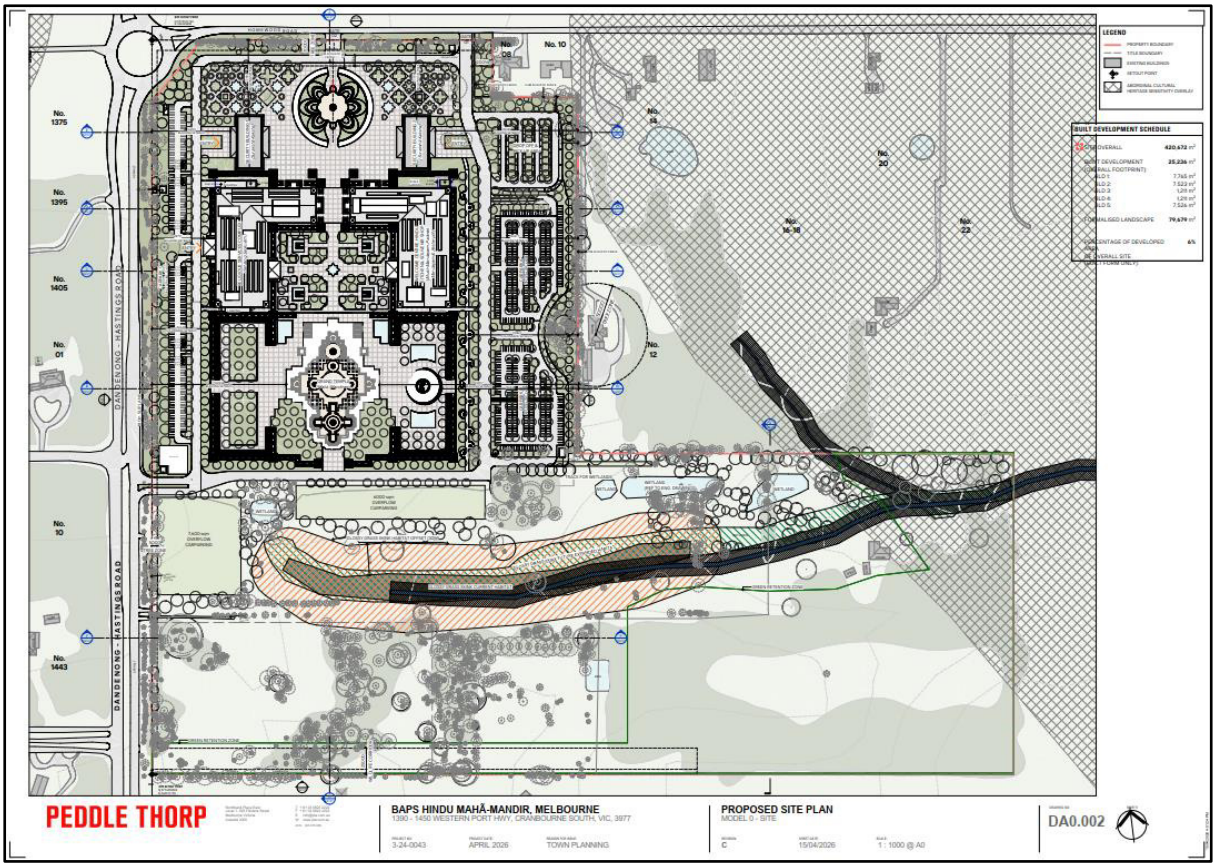


**Figure 1: Proposed Development Plan (Source: Peddle Thorp Project 3-24-0043 DA0.002)**

Our commission was to complete a geotechnical site investigation and provide recommendations to assist with civil, structural and pavement design for the proposed development. It is recognised that not all development elements have been finalised and that changes to the masterplan and development elements may occur. As such the recommendations provided herein may require iteration as the project progresses.

The professional advice provided in this report is based on the information provided at the time of the report preparation and may not be valid if changes are made to the site, the proposed development, or the construction methods indicated. In the event of such changes, further advice should be sought from Ground Science.

## 3. FIELDWORK

The geotechnical investigation was undertaken between 08 October to 12 December 2024 which included the following:

1. undertake the performance of
    a. 11 test pits to a target depths of 2.5 m below existing surface levels (or prior refusal)
    b. 5 boreholes to a target depth of 5 m below ground level (or prior refusal)
    c. 4 boreholes to a target depth of 8 m below ground level
2. in-situ testing comprised Dynamic Cone Penetrometer (DCP) at all test pit locations and Standard Penetration Test (SPT) within all the deep boreholes at 1.5 m intervals
3. logging of soils in general accordance with AS1726 (2017) 'Geotechnical Site Investigation'
4. collection of subsurface soil samples for subsequent laboratory testing
5. recording the location of the test locations using hand-held GPS (to an accuracy of +/- 5 m)
6. documentation and photography of surface conditions
7. backfilling of test locations using recovered spoils and surface tampered.

The fieldwork was undertaken and supervised by a suitably experienced and qualified geotechnical engineer who located the tests, logged the soils, recovered the soil samples and documented the site photographs. Test pit excavations were performed by an experienced subcontractor and deep boreholes were completed by a qualified drilling team under the supervision of a Ground Science geotechnical engineer.

## 4. RESULTS

### 4.1 REGIONAL GEOLOGICAL CONDITIONS

An understanding of the regional geological conditions was undertaken through the review of the GeoVic online geological database. Reference was made to the available Geological Survey of Victoria map sheet (1:250,000) which indicates the site to be underlain by Late Ordovician to Middle Devonian aged Murrindindi Supergroup soils. The regional geological conditions are presented in Figure 3.

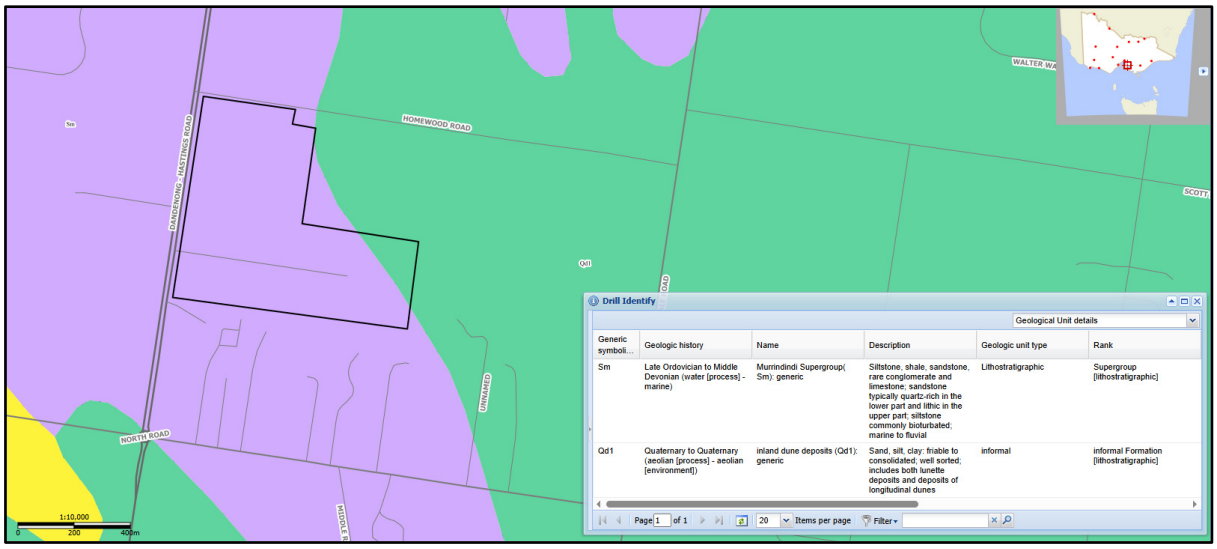


**Figure 3: Regional Geological Conditions (Source: Seamless Geology Geological Maps)**

It should be noted that the boundaries in the regional geological map sheets are representative only, hence, they can vary. The above review does not consider any fill or foreign materials that may be present.

### 4.2 REGIONAL GROUNDWATER

A review of Visualising Victoria's Groundwater (VVG) Online database indicates the depth of the regional groundwater to be 5 m or less below existing ground levels in the northern section, between 10 m to 20 m in part of the eastern and southern sections and between 5.0 m to 10 m in the rest of the site. Changes in groundwater depth may occur from changes in site drainage and environmental conditions. Perched groundwater may be encountered within soils of low permeability (where present) or at the boundary of soils with contrasting permeability.

### 4.3 SITE CONDITIONS

The site comprises several rural-type residential dwellings and stables bounded by Homewood Road from the north, rural residential type dwellings from the east / south and Westernport Highway from the west.

The general topography of the site was observed to be slightly sloping from west to east, with minor undulation across the site. The ground cover was mainly comprised of grass, scattered small to medium trees / group of trees and bushes.

Drainage conditions were inferred to be poor to good. Some low lying / water ponding areas were observed in the southern corners of 1390 Western Port Highway and across 1430 Western Port Highway properties.

At the time of investigation, several structures were present across the site and evidence of demolition of previous structures was also observed. Some internal access roads comprising crushed rock surfaces were observed across the site. Several dams were observed in the northern section of the site with signs of soft ground conditions around the dams indicating to be a result of the water overflow.

Site photographs taken during the field investigation are presented in **Appendix E**.

### 4.4 SUBSURFACE CONDITIONS

#### 4.4.1 SUBSURFACE SOIL PROFILE

The geotechnical investigation has indicated the subsurface soil profile to be generally consistent across the site. The location of the tests performed is shown in **Appendix A** and detailed surface soil descriptions are presented in the engineering logs in **Appendix B**.

A summary of the subsurface soil units encountered is presented below.

**Unit 1: Topsoil**

The Unit 1 topsoil was observed in all the test locations except the test locations TP10 and TP11 to a depth of 0.1 m to 0.2 m. The unit comprised the following:

1. clayey / sandy SILT, low plasticity, grey, fine grained sand, with root fibres, moisture equal to dry of plastic limit, soft to very stiff
2. silty CLAY, low to medium plasticity, dark grey, with root fibres, moisture wet of plastic limit, soft
3. silty SAND, fine grained, dark grey, with root fibres, dry, loose.

**Unit 2: Inferred Fill**

The Unit 2 inferred was only encountered only at the test locations TP06, TP10, TP11 and MB2. The unit was recovered as silty CLAY, low to medium plasticity, brown mottled orange and grey, with fine to coarse grained sand, trace fine to coarse grained gravel, trace root fibres and organic inclusions observed, moisture wet of

plastic limit, very soft to soft and silty sandy GRAVEL, fine to coarse grained, grey, fine to coarse grained sand, trace low plasticity clay, cobble observed, dry, dense to very dense.

**Unit 3: Inferred Murrindindi Supergroup Soil**

The Unit 3 inferred Murrindindi Supergroup soils encountered in all the test locations and recovered as:

1. Unit 3a – clayey SILT, low plasticity, pale grey, with fine grained sand, moisture dry of plastic limit, hard. This subunit was only recovered at test locations TP03, MB01 to MB04, BH1 to BH3, and BH05
2. Unit 3b – silty CLAY, low to high plasticity, grey / brown mottled orange and grey, various portions of sand and gravel, weathered rock observed towards the bottom of the unit. Occasional root fibres observed decreasing with depth, moisture wet of plastic limit to equal of plastic limit, stiff to hard.

**Unit 4: Extremely Weathered Rock**

Extremely weathered siltstone was recovered in all the test locations underlying Unit 3 soils. The unit was recovered as clayey SILT / silty sandy GRAVEL, low plasticity, fine to medium grained, brown / pale grey white, various portions of sand, moisture dry of plastic limit, hard.

**Unit 5: Weathered SILTSTONE**

The test locations MB1 to MB4 advanced through the weathered siltstone to a target depth of 8.0 m below the existing ground level. The weathered siltstone underlying Unit 4 extremely weathered siltstone was recovered as distinctly weathered pale grey mottled white and brown siltstone with low to medium strength. In general, core recovery and quality were between good to poor with frequent core losses experienced.

The depth range of soil units encountered is presented in Table 1 below.

**Table 1: Depth Range of Soil Units**

| Borehole | Unit 1: Topsoil | Unit 2: Inferred Fill | Unit 3: Inferred Murrindindi Supergroup Soil | Unit 4: Extremely Weathered Siltstone | Unit 5: Weathered SILTSTONE | Test Completion Depth (m) |
|---|---|---|---|---|---|---|
| | Depth Range of Soil Unit (m) | | | | | |
| TP1 | 0.0-0.1 | - | 0.1-1.7 | 1.7-2.0 | - | 2.0 R |
| TP2 | 0.0-0.2 | - | 0.2-1.0 | 1.0-1.5 | - | 1.5 R |
| TP3 | 0.0-0.15 | - | 0.15-1.0 | 1.0-1.35 | - | 1.35 R |
| TP4 | 0.0-0.15 | - | 0.15-1.4 | 1.4-1.8 | - | 1.8 R |
| TP5 | 0.0-0.2 | - | 0.2-1.8 | 1.8-2.2 | - | 2.2 R |
| TP6 | 0.0-0.1 | 0.1-0.35 | 0.35-1.1 | 1.1-1.45 | - | 1.45 R |
| TP7 | 0.0-0.2 | - | 0.2-2.0 | 2.0-2.4 | - | 2.4 R |
| TP8 | 0.0-0.2 | - | 0.2-1.7 | 1.7-1.9 | - | 1.9 R |
| TP9 | 0.0-0.2 | - | 0.2-1.8 | 1.8-2.2 | - | 2.2 R |
| TP10 | - | 0.0-0.25 | 0.25-1.5 | 1.5-1.8 | - | 1.8 R |
| TP11 | - | 0.0-0.25 | 0.25-1.5 | 1.5-1.9 | - | 1.9 R |
| BH1 | 0.0-0.1 | - | 0.1-1.5 | 1.5-3.3 | - | 3.3 R |
| BH2 | 0.0-0.1 | - | 0.1-1.8 | 1.8-5.0 | - | 5.0 T |
| BH3 | 0.0-0.1 | - | 0.1-1.7 | 1.7-4.2 | - | 4.2 R |
| BH4 | 0.0-0.1 | - | 0.1-2.1 | 2.1-5.0 | - | 5.0 T |
| BH5 | 0.0-0.1 | - | 0.1-1.8 | 1.8-2.2 | - | 2.2 R |
| MB1 | 0.0-0.2 | - | 0.2-1.3 | 1.3-2.2 | 2.2-8.0 | 8.0 T |
| MB2 | 0.0-0.1 | 0.1-0.6 | 0.6-3.0 | 3.0-4.2 | 4.2-7.5 | 7.5 T |
| MB3 | 0.0-0.2 | | 0.2-1.8 | 1.8-7.0 | 7.0-8.0 | 8.0 T |
| MB4 | 0.0-0.2 | | 0.2-1.5 | 1.5-4.5 | 4.5-8.0 | 8.0 T |

### 4.4.2 GROUNDWATER

No permanent groundwater table or any groundwater seepage was observed during the field investigation except at test location MB2 where a minor groundwater seepage was observed at 0.6 m below the existing ground level.

Changes to the depth of the water table may occur from changes in site drainage and environmental conditions. Perched water tables may be encountered within soils of low permeability (where present) or at the boundary of geological deposits, particularly where silt overlies clays.

## 4.5 IN-SITU TESTS

In-situ test comprising Dynamic Cone Penetrometer Tests and Standard Penetration tests were conducted within the test locations to understand the strength conditions of the subsurface soils.

### 4.5.1 DYNAMIC CONE PENETROMETER (DCP) TEST RESULTS

DCP tests were conducted adjacent to all test pit locations to a target depth of 1.5 m below existing surface level. A summary of the DCP test results is presented in Table 2 overleaf.

**Table 2: Dynamic Cone Penetrometer (DCP) Test Results**

| DCP No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | TP1 | TP2 | TP3 | TP4 | TP5 | TP6 | TP7 | TP8 | TP9 | TP10 | TP11 | MB1 |
| Datum (m) | ESL | | | | | | | | | | | |
| Depth (m) | Blows per/100mm | | | | | | | | | | | |
| 0.0-0.1 | 12 | 2 | 8 | 4 | 4 | 6 | 3 | 3 | 7 | 20+ | 7 | 1 |
| 0.1-0.2 | 13 | 3 | 11 | 6 | 3 | 14 | 4 | 3 | 5 | - | 5 | 2 |
| 0.2-0.3 | 20 | 9 | 14 | 9 | 11 | db | 4 | 4 | 5 | - | 3 | 3 |
| 0.3-0.4 | 13 | 11 | 10 | 3 | 8 | - | 9 | 6 | 4 | - | 2 | 8 |
| 0.4-0.5 | 8 | 5 | 10 | 3 | 5 | - | 8 | 4 | 2 | - | 3 | 8 |
| 0.5-0.6 | 9 | 4 | 9 | 3 | 4 | - | 7 | 4 | 2 | - | 4 | 12 |
| 0.6-0.7 | 9 | 3 | 9 | 2 | 3 | - | 5 | 5 | 2 | - | 4 | 13 |
| 0.7-0.8 | 7 | 3 | 9 | 3 | 2 | - | 5 | 5 | 2 | - | 5 | 15 |
| 0.8-0.9 | 7 | 7 | 8 | 2 | 3 | - | 4 | 6 | 3 | - | 5 | - |
| 0.9-1.0 | 10 | 10 | 12 | 2 | 2 | - | 6 | 6 | 3 | - | 7 | - |
| 1.0-1.1 | 12 | 20+ | 16 | 3 | 4 | - | 7 | 7 | 4 | - | 6 | - |
| 1.1-1.2 | 13 | - | 13 db | 4 | 4 | - | 5 | 6 | 6 | - | 5 | - |
| 1.2-1.3 | 11 | - | - | 5 | 3 | - | 5 | 7 | 5 | - | 6 | - |
| 1.3-1.4 | 11 | - | - | 9 | 5 | - | 6 | 8 | 6 | - | 8 | - |
| 1.4-1.5 | 11 | - | - | 20+ | 5 | - | 6 | 8 | 7 | - | 10 | - |
| Unit 1 | | | | | | | | | | | | |
| Unit 2 | | | | | | | | | | | | |
| Unit 3 | | | | | | | | | | | | |

db denoted double bounce

The results of testing generally indicate the following strength conditions of the soils encountered:

1. Unit 1 Topsoil – loose relative density or soft to very stiff consistency
2. Unit 2 Inferred Fill / Fill – dense to very dense relative density
3. Unit 3 Inferred Murrindindi Supergroup Soil – stiff to hard consistency.

Penetration refusal was experienced in several test locations. It is anticipated that the penetration refusal is due to the presence of coarse grained particles in Unit 2 and weathered siltstone.

It must be noted that the results of testing are reflective of the condition of the soils at the time of the investigation. The in-situ strength conditions will vary subject to drainage conditions, confining conditions and exposure of the subsurface soils to the effects of weathering.

### 4.5.2 STANDARD PENETRATION TEST RESULTS

The standard penetration test was conducted within Unit 3b soils and a N value between 22 and 32 was recorded. However, an N value of 8 was recorded at the boundary of Unit 3a and Unit 3b indicating the presence of low strength soils at the boundary. It should also be noted that the results of testing are reflective of the condition of the soils at the time of the investigation. The in-situ strength conditions will vary subject to drainage conditions, confining conditions and exposure of the subsurface soils to the effects of weathering.

## 4.6 LABORATORY TEST RESULTS

Laboratory testing was conducted on selected soil samples from Unit 3 soils. The results of the laboratory tests conducted on soil are summarised in Table 3.

**Table 3: Summary of Laboratory Test Results**

| Test Location | Soil Unit | Depth (m) | Material Classification | Particle Size Distribution | Atterberg Limits Test | Weighted Plasticity Index | Field Moisture Content (%) | Optimum Moisture Content (%) | Soaked CBR |
|---|---|---|---|---|---|---|---|---|---|
| BH4 | Unit 3 | 1.3-1.5 | CLAY | Gravel=6% | LL=41% | 1953 | 23.5 | - | - |
| | | | | Sand=3% | PL=20% | | | | |
| | | | | Fine=91% | PI=21% | | | | |
| | | | | | LS=5.5% | | | | |
| TP01 | Unit 3 | 0.15-0.3 | CLAY | Gravel=3% | LL=20% | 665 | 5.9 | - | - |
| | | | | Sand=9% | PL=13% | | | | |
| | | | | Fine=88% | PI=7% | | | | |
| | | | | | LS=1.5% | | | | |
| TP01 | Unit 3 | 0.5-0.7 | CLAY | Gravel=0% | LL=52% | 3000 | 22.5 | 26.5 | CBR Value: 3.5% |
| | | | | Sand=1% | PL=22% | | | | |
| | | | | Fine=99% | PI=30% | | | | Swell: 1.0% |
| | | | | | LS=6.0% | | | | |
| TP04 | Unit 3 | 0.8-1.1 | CLAY | Gravel=% | LL=67% | 4100 | 30.2 | - | - |
| | | | | Sand=% | PL=26% | | | | |
| | | | | Fine=99% | PI=41% | | | | |
| | | | | | LS=7.0% | | | | |
| TP07 | Unit 3 | 0.3-0.5 | CLAY / SILT | Gravel=1% | LL=23% | 480 | 9.1 | - | - |
| | | | | Sand=20% | PL=18% | | | | |
| | | | | Fine=79% | PI=5% | | | | |
| | | | | | LS=1.0% | | | | |
| TP10 | Unit 3 | 0.6-0.8 | CLAY | Gravel=0% | LL=54% | 3100 | 22.3 | 26 | CBR Value: 4.5% |
| | | | | Sand=3% | PL=23% | | | | |
| | | | | Fine=97% | PI=31% | | | | Swell: 1.0% |
| | | | | | LS=7.0% | | | | |
| LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; CBR: 4-Day Soaked CBR; %Swell: Percentage Swell as measured in Soaked CBR Test. | | | | | | | | | |

The results of the laboratory testing have indicated the following properties and characteristics:

1. classification tests conducted generally indicate the Unit 3 soils as Clay. Unit 3 soils recovered immediately below the topsoil have been tested to comprise SILT or CLAY
2. The linear shrinkage test conducted on Unit 3 soils indicated cracking when dried
3. The Atterberg Limits and weighted plasticity index for Unit 3 soils indicates the soils have variable reactivity between low to high and are likely to exhibit a low to high expansive nature (low to very high-volume change over moisture change)
4. the field moisture content of the samples at their respective depth was found to be highly variable across the site. The existing shape of the topography and the soil composition may have contributed to the moisture variation within the subsurface soil profile
5. Unit 3 indicated CBR values between 3.5 % and 4.5 % with a percentage swell of 1.0 %.

Laboratory testing was also conducted on selected soil samples from Unit 3b soils to assess their aggressivity concrete and steel. A summary of the results is presented below:

**Table 4: Results of Aggressivity Tests**

| Corrosion Classification | | BH01: 0.95m-1.0m | BH03: 0.95m-1.0m | BH04: 0.95m-1.0m |
|---|---|---|---|---|
| **Exposure Classification - Concrete Piles** | Soil Condition A | Mild | Mild | Mild |
| **Exposure Classification - Concrete Piles** | Soil Condition B | Non-Aggressive | Non-Aggressive | Non-Aggressive |
| **Exposure Classification - Steel Piles** | Soil Condition A | Non-Aggressive | Non-Aggressive | Non-Aggressive |
| **Exposure Classification - Steel Piles** | Soil Condition B | Non-Aggressive | Non-Aggressive | Non-Aggressive |

Based on the bore logs, the exiting subsurface soils are low permeable, and absence of groundwater, soil condition B is considered applicable for the site. The samples indicate non-aggressive exposure classifications.

Laboratory test reports are presented in **Appendix C**.

## 5. DISCUSSION

The results of the investigation indicated the subsurface profile to comprise:

1. Unit 1 topsoil: 0.1 m to 0.2 m thick comprising both fine and coarse grained soil
2. Unit 2 inferred fill: 0.25 m – 0.6 m thick observed sporadically
3. Unit 3 inferred Murrindindi Supergroup soils observed in all test locations to a depth of 1.0 m to 3.0 m below the existing ground level overlying Unit 4 extremely weathered siltstone
4. Unit 5 weathered siltstone was encountered at 2.2 m to 7.0 m below the existing ground level.

In-situ geotechnical testing indicated the consistency of Unit 3 soils variable from firm to hard with a general increase in depth. Laboratory test results indicated the Unit 3 soils are low to highly reactive, hence, careful consideration should be given to the surface water management on-site. No groundwater was observed during the investigation except for minor water seepage at 0.6 m below the ground level at borehole location MB02. Several key geotechnical challenges have been identified (detailed in Section 6 below) and will require careful consideration and design.

## 6. PRELIMINARY GEOTECHNICAL CONSIDERATIONS

The geotechnical investigation indicates some key geotechnical considerations will need to be understood to assist the civil design and construction of the proposed development, including (but not limited to):

1. **timing**: construction timing, management of drainage and seasonal effects must be considered. After stripping / boxing works are completed, the soils will be difficult to work with if left exposed to wet weather elements or if allowed to be inundated with water. If road boxing through subgrade is left exposed to excessive moisture (particularly in wet winter months or following rainfall in summer months), will act as a catchment for overland surface flows and ultimately result in extensive soft soil zones which will either require over-boxing or significant remediation measures (e.g. dual or triple lift stabilisation). The project contractors must understand the problematic nature of the soils and provide a suitable methodology as part of overall site management
2. **weak subgrade**: weak subgrade (Unit 3b, particularly where silt content is high) which may develop within the exposed Unit 3 soils. The results indicate that weak subgrade conditions can occur within the top section of the soil profile and are likely to develop over a short period of time if site drainage, gradients and protection of the soils are not appropriately managed. Weak subgrade can impact the placement of fill, the performance of pavements and footing systems and trafficability during the construction phase which may require over-excavations, remediation or deepening of footing systems. It is strongly recommended that consideration be given to improving / developing drainage as soon as practically possible to relieve the ground of excess moisture and allow for suitable run-off during wet weather events. Construction should not occur during winter / wet seasons without suitable provisions to remediate weak and wet subgrade
3. **sensitive soils**: Sensitive soil, clayey silt, is present at some test locations within the top 0.2 m to 1.0 m of the Unit 3 soil profile. These materials are extremely sensitive to changes in confining pressures and moisture conditions. Where the confining pressure is reduced or where excess moisture is present, these soils are expected to become unstable which will impact the stability of excavations. Careful planning and construction techniques will be required for excavations. We recommend all vertical trenches are suitably retained and that suitable groundwater management is provided where required
4. **problematic soils**: clayey silt soils within the top section of Unit 3 are expected to be challenging for construction with regards to earthworks:

a. perched water can develop within the silt materials and may result in the softening of soils, leading to inadequate bearing capacity and unsuitable conditions for excavations and earthworks. Suitable dewatering methods are potentially required during underground service construction

b. placement of fill over these soils is not recommended

c. differential surface movements due to the variation in characteristics and properties subgrade. Infrastructure partly founded on non-reactive and reactive soils is expected to experience differential surface movements. These conditions should be avoided, and where unavoidable, the design must consider differential movement potential. Further geotechnical assessment and advice will be required for this outcome to accurately inform design especially for underground services.

5. **trafficability and workability**: It is anticipated that site trafficability and workability of the soils will be very poor during wet or winter months, with a slight improvement during dry, and summer months once the topsoil layer is removed. It is recommended that earthworks are completed within drier months, where possible. Management of soft soils and / or boggy conditions will however be required throughout the year

6. **reactive soil**: consideration will need to be given to the potential impact of variably reactive / expansive soils on infrastructure and construction works:

    a. pavements will require subgrade improvement / protection to provide trafficability and reduce variable volumetric change/surface movements of the subgrade. In-situ stabilisation using lime and cement is recommended and understood to be the preferred approach

    b. underground services (and other infrastructure) founded on low reactive soil that transition onto highly reactive clay soils, or vice versa, may experience differential surface movements. Typically, we recommend all infrastructure is founded on homogenous subsurface materials, however, we understand that this may not be practical for some infrastructure and suitable design shall be applied for these conditions

    c. backfill of services with soils of variable reactivity may result in differential surface movements. Consideration shall be given to the use of appropriate backfill soils subject to the development area and surrounding soil conditions

    d. filling with reactive soils is expected to further increase the reactive potential of the subgrade soils and the impacts of this must be considered in the design

    e. highly reactive soils may desiccate during dry seasons and become weak during wet seasons. The low reactive and silt soils may become soft and highly eroded during wet seasons. All soils are expected to generate dust during dry seasons. Wet and weak soils and soils that desiccate can impact the performance of infrastructure. Wet and weak subgrade can also lead to trafficability and construction issues.

7. **shallow rock**: weathered siltstone rock was present across the site and excavations through the rock may be required given the levels of structures and for deeper services. Suitable machinery to be selected. Where required further geotechnical testing is required to assess the strength of the rock

7. **site preparation**: existing trees / building structures that may need to be removed. All root systems including stumps, existing footings, and underground services should be removed completely prior to any bulk earthwork activity on the site. Building, footings, services and substructure demolition will result in disturbed (in-filled) soil conditions

# 7. RECOMMENDATIONS

## 7.1 EARTHWORKS

With reference to the latest floor plans and sections drawing prepared by Paddle Thorp (Project no: 3-24-0043 dated April 2026), we understand the bulk earthworks will majorly comprise both cut and filling.

All earthworks must be carried out in general accordance with AS3798 (2007) 'Guidelines on Earthworks for Commercial & Residential Developments'. Filling in excess of 0.3 m shall be completed to Level 1 Inspection & Testing procedures as defined in AS3798 (2007).

### 7.1.1 RE-USE OF SITE WON SOILS AS GENERAL FILL & SUITABLE FILL MATERIALS

Re-use of each soil unit is described below:

1. **Unit 1 topsoil:** considered not suitable for re-use as general fill but may be considered for landscaping purposes with no structural loading. This is also subject to further testing to AS4419 if required
2. **Unit 2 Fill / Inferred Fil**: these materials were typically 0.25 m to 0.65 m thick and found to overlie the Unit 3 soils. This material comprised both fine (clay) and coarse (gravel) grained soils. The fine grained soils can be reused as general fill upon GITA approval. The coarse grained material may salvaged to re-use for pavement construction if required. Further laboratory testing is however required to confirm the salvaged material can be reused for pavement construction
3. **Unit 3a**: the clayey silt materials are not suitable for re-use as general fill. Consideration may be given to reuse for landscaping purposes with no structural loading. This is also subject to further testing to AS4419 if required
4. **Unit 3b:** this material can be re-used as general fill
5. **Unit 4 and Unit 5:** this material may potentially be used as fill however is unlikely to be excavated as part of the works – further advice shall be sought from the project GITA if a surplus of this material is available from excavations.

All suitable fill materials will require strict moisture conditioning and control to be maintained. Where these soils become too dry, they will not respond appropriately to compaction and may laminate. Where these soils become too wet, compaction is not likely to be achieved, and the soils will be difficult to work with.

Further assessment of the on-site soils proposed for re-use as general fill will be required by the nominated geotechnical inspection and testing authority (GITA) in accordance with Section 8 of AS 3798 (2007). The GITA will be required to ensure any inert material (i.e. organics, topsoil, silt or building waste) is fully removed prior to re-use.

Where fill is imported, we recommend using matching plasticity soil types so that areas of filling match that of the general surrounding and in-situ ground conditions. Where varying plasticity soil is used the difference in material plasticity may cause performance issues and differential ground movements and will be detrimental to services/ foundations which are supported by this fill.

### 7.1.2 PRELIMINARY EARTHWORKS PROCEDURE FOR GENERAL FILL

The following preliminary earthworks procedure for general fill relates to the bulk earthworks phase of the project.

1. strip all loose / soft soils, topsoil, silty sand and sand, vegetation, silts, organics or organic rich soils and foreign matter to a suitable base comprising stiff or better and damp Unit 3b soils, approved by the superintendent or representative (GITA). During stripping, care shall be taken to remove the topsoil and prevent mixing with any other materials that may be suitable for re-use as general fill. The topsoil shall be stockpiled separately from any other potentially suitable fill materials

2. rip / tine the subgrade to a depth of not less than 300 mm. The subgrade shall be moisture conditioned to within ±3% of the Optimum Moisture Content (OMC) and compacted to a target density ratio of not less than 95% Standard Compaction
3. **hold point.** The GITA or a geotechnical engineer must be commissioned to inspect the subgrade.
    a. the subgrade inspection shall comprise the performance of a proof roll per AS3798 (2007) with the use of a fully loaded water cart (12-tonne equivalent load)
    b. where weak subgrade is present (i.e. subgrade ruts, heaves, deflects, pumps), this shall be remediated accordingly, subject to the area of proposed development. In general, the weak subgrade may be removed down to a dry to damp and stiff or better base and replaced with controlled cohesive fill as per dot points 4 to 9
    c. where an alternative remediation option is considered, further advice shall be sought from Ground Science. Filling shall not proceed until the subgrade has been inspected and approved by a geotechnical engineer or the project GITA.
4. knead the subgrade and moisture condition prior to the placement of subsequent fill to promote successful keying in of subsequent fill layers
5. moisture condition the fill to within ±3% of the OMC
6. place approved clean fill in layers not exceeding 200 mm loose layer thickness. The fill shall not contain building rubble, organics, compressible materials, silt, unsuitable / deleterious materials or greater than 20% by volume of particles coarse than 37.5 mm and no particle over 100 mm in any dimension. The fill must be inspected and approved by the on-site GITA prior to placement
7. compact the fill layers to the following:
    a. Dry Density Ratio of not less than 95% Standard for all general filling areas (AS 1289: 5.1.1, 5.4.1 or 5.7.1)
    b. Dry Density Ratio of not less than 98% Standard for areas of filling where structures similar to commercial loads are anticipated (AS 1289: 5.1.1, 5.4.1 or 5.7.1) – **note this will apply to the proposed Building 1 - Grand Temple**
    c. Dry Density Ratio of not less than 98% Standard within the top 300 mm of the finished subgrade level for pavements (AS 1289: 5.1.1, 5.4.1 or 5.7.1).
8. validate moisture condition and compaction levels via density testing. The frequency of field density tests may be undertaken in accordance with the guidelines in AS3798 (2007) for large scale developments (Type 1), which nominates a frequency of not less than:
    a. 1 test per layer or 200 mm per 2500 m2
    b. 1 test per 500 m3 distributed reasonably evenly throughout the full depth and area
    c. 3 tests per site visit; whichever requires the most tests.

Care must be taken by the nominated civil contractor to ensure suitable drainage conditions are provided during the earthworks phase. Where poor drainage and site management techniques are adopted, soft / weak subgrade conditions are expected to occur which will eventuate in additional and potentially unnecessary subgrade remediation.

Following the completion of filling, it is important to protect the fill from poor drainage conditions and weathering. It is recommended that topsoil is placed above the fill and that suitable drainage conditions are provided to

appropriately manage surface water.

It should be noted that the final fill layers (typically the top 200 mm to 300 mm) of a constructed engineered fill platform may be subjected to adverse weather conditions resulting in either surface softening or drying and cracking over time; regardless of the compaction efforts and moisture conditioning applied during the works. The placement of topsoil can act as a protective layer until structures / substructures commence construction, however, this should also be paired with good grades, drainage management and maintenance of the fill platform. Completed fill platforms that are left exposed to (i.e. not topsoiled) extended weather elements may result in riling / erosion of the fill materials.

### 7.2 EXCAVATION CHARACTERISTICS AND BATTER SLOPES

It is anticipated that the Unit 1 to Unit 5 materials will be readily excavated using conventional earthmoving equipment. Some level of difficulty may be experienced when excavating the Unit 5 materials.

Bulk earthworks involving cutting and filling are expected to achieve civil design levels. The depth of excavations or height of batters is unknown. We assume that unsupported excavations and batter slope heights will not exceed 3 m.

Any vertical excavations exceeding 1.2 m in height must be suitably retained (i.e. shoring or similar) or battered. Any excavations or batter slopes exceeding 3 m in height will require stability analysis to assess the global stability and suitability of the excavation or batter slope.

We recommend the following temporary batter slope angles for excavation heights of 3 m, or less:

a. Unit 1 and Unit 2: 1V:2H
b. Unit 3a: 1V:2H
c. Unit 3b and Unit 4: 1V:1H

Controlled cohesive fill placed and compacted to not less than 95 % - 98 % Standard Compaction may be designed and constructed at 1V:1.5H. For permanent batter slope angles, due to the uncertainty of the location / any surcharge, we recommend conducting a software analysis to define the permanent batter slope angles which Ground Science can assist with.

The above recommendations assume groundwater is present below the toe of the temporary batter / excavation, that soils are in a dry to damp and firm to stiff or medium dense to dense or better condition, that the temporary batter slopes will not be surcharged and excellent drainage conditions provided such that surface water does not interact with the face of excavations. We consider that the above recommended temporary batter slope angles are appropriate for preliminary purposes and are subject to further inspection and validation by a suitably qualified and experienced engineering geologist or geotechnical engineer. We recommend the following measures to be implemented during excavation and temporary slope battering works:

1. surface water flows to be diverted from excavations/batters to ensure sufficient drainage is provided during earthworks
2. water ponded at the base of excavations to be diverted to a sump pit and suitably removed
3. excavation works to be carried out in dry working conditions where possible
4. surcharge loading from plant / stockpiles to maintain safe distances from crests of open excavations. For preliminary purposes, we recommend a safe distance equal to the height of the excavation
5. excavation works to not undermine any existing infrastructure, footings or services
6. star pickets and high visibility flagging to be erected around excavations where fall hazards are present and to delineate these areas for plant

7. water to not come into contact with the open face of any excavations which may cause surface erosion or fretting, leading to instabilities within the excavated face. Any signs of surface erosion and tension cracks should be reported to Ground Science for further advice
8. suitable erosion prevention practices to be adopted for the work site.

Shoring or other retention systems can be considered where the abovementioned recommendations cannot be achieved onsite. Further geotechnical advice must be sought from Ground Science should this be required.

### 7.3 FOOTING DESIGN

The proposed footing style for the proposed development is known. General footings design is provided overleaf. Ground Science shall be contacted if further design guides are required.

#### Shallow Footings

Subject to the final surface levels, the footings may be supported by Unit 3b, Unit 4, or Unit 5. Spread footing systems, such as stiffened raft slabs, shall ensure all load-bearing beams / ribs are suitably embedded within Unit 3b soils or better. It is anticipated that an embedment of 100 mm into these materials may adopt an allowable bearing pressure of 100 kPa subject to stiff and dry conditions.

Pad and strip footings should be found within the Unit 3b or Unit 4 soils. An allowable bearing pressure of 120 kPa and 150 kPa is considered applicable for footing embedment of 200 mm and 500 mm, respectively. Alternatively, footings may be founded on continuous siltstone rock, which shall be verified during construction. An allowable bearing pressure of 250 – 500 kPa may apply for footings founded on highly weathered or better siltstone, however, the depth, continuity, degree of weathering and fracturing / defects must be verified by a qualified engineering geologist / geotechnical engineer during construction.

It should be noted that construction timing has an impact on the above-given values. Construction in wet seasons may ensure a reduction in the bearing pressure within all the units including Unit 5 due to being exposed to moisture, which must be addressed as part of drainage design. All footings must be verified by a suitably qualified geotechnical practitioner during construction. It is critical to note that all footings must be founded on uniform materials to mitigate excessive differential movements, and as such, some localised deepening of footings may be required, pending the presence / absence of continuous bedrock.

Any service trenches near existing footings should adhere to the following guidelines provided by Cement and Concrete Association's Guide to Residential Floors Handbook. Where deeper fill is required, it should be placed in a controlled manner defined in AS3798 (2007) 'Guidelines on Earthworks for Commercial & Residential Developments' as discussed in the Section 6.1.2.

#### Deep Footings

Where deep footings such as bored piles are adopted, the footings may be socketed into continuous weathered basalt rock and designed using the following design parameters:

**Table 3: Engineering Design Parameters**

| Unit | Anticipated Depth Range | Allowable End Bearing Pressure ($f_B$) | Allowable Skin Friction ($f_S$) |
|---|---|---|---|
| 3 | 0.1-2.0 | - | 18 kPa |
| 3 and 4 | 2.0-2.9 | 250 kPa | 22 kPa |
| Unit 5 | 2.0 m + | 450 – 600 kPa (to be verified) | 25 kPa |

No skin friction shall be adopted for uncontrolled FILL soils or soils within 1000 mm of surface level. Bored pier design parameters assume a pier depth to diameter ratio of at least 4 (depth of penetration into founding soils). Based on the regional geological conditions, it is assumed that materials similar to or better quality than the suggested founding soils are present for lengths of at least 4 x the pile diameter below the toe of the pile.

## 7.4 PAVEMENTS

It is understood that the project will involve the development of internal access pavements and open car parking facilities. Based on the initial concept plans, it is noted that several car parks will be constructed, each with a designated number of spaces, bus parking, and entry/exit points; i.e., the car parking layout will not be continuous.

Internal access pavements are expected to distribute traffic across an internal road network; we anticipate that local connector pavements facilitating access into/out from the site will likely form part of the development. We have assumed that the internal road network (including car parks) will be owned and maintained by the site operators.

We have referred to the Traffix Group Memorandum (G35518R-01C dated April 2026), which sets out the car parking requirements. It is proposed to manage the car parking requirements through the use of an online booking system (whereby patrons must prebook for major festivals) and the provision of a formal, paved car parking area for primary demands, and an 'overflow', gravel or grassed area for peak demands. It is also expected that a percentage of the daily vehicle volumes will comprise buses, which are likely to utilise the car parks for bus parking.

At this stage, we understand that the car parking layout, internal road network and designated traffic generation has not been finalised. As such, the following recommendations should be treated as preliminary, and the pavement design can be finalised upon approval of the road network/car parking layout plans.

The design of pavements was carried out in accordance with Austroads Guide to Pavement Technology (Part 2 – 2017) and applicable VicRoads guidelines.

### 7.4.1 SUBGRADE CONDITIONS

The Unit 3B Silty CLAYS (or sandy clay/clay) deposits are considered suitable as a pavement subgrade. It is anticipated that Unit 3A clayey SILTs will likely be encountered in some zones, these materials are not recommended to form the pavement subgrade in their current condition. The Unit 3B clayey silts are prone to softening and are unlikely to meet construction hold points such as compaction and proof rolling.

We suggest that over-excavation of the Unit 3B clayey silts is carried out under the direction of the project GITA where required. Alternatively, these materials can be improved using in-situ stabilisation techniques, further discussed below.

A design CBR value of 3.0% was adopted for pavement design purposes. Any fill materials placed in pavement zones (if required) must exhibit a 4-day soaked CBR value of not less than 3.0%.

### 7.4.2 SUBGRADE PROTECTION

The investigation has shown that the Unit 3 soils are expected to be reactive/expansive and may also comprise clayey silt or materials with a high silt content. As such, we anticipate that expansive soil and weak soil challenges are likely to be encountered during construction and over the pavement serviceable life.

A subgrade protection layer is recommended for the site. It should, however be noted that the use of conventional options such as capping layers is not considered suitable based on our experience in the locality and local geological deposits.

In-situ stabilisation using lime/cement is recommended for the project. We recommend that a minimum 0.3 m thick in-situ stabilisation using lime/cement is completed by an AustStab and NTRO accredited stabilisation contractor. A mix design shall be carried out by the stabilisation contractors. For preliminary purposes, a mix design of 4% Lime and 3% cement may be considered for tender pricing purposes.

### 7.4.3 DESIGN TRAFFIC LOADING ASSUMPTIONS

Design traffic loading was not provided for the proposed car park. We refer to the assumptions set out in the traffic engineering assessment prepared by Traffix Group.

We consider **three scenarios** are likely to apply:

- AADT value of up to 5000 veh/day during surge periods and likely to apply to collector pavements and **formal, sealed main car park**
- AADT value of up to 2800 veh/day during surge periods and likely to apply to **informal, unsealed car parks.**

A 3% heavy vehicle loading has been applied to the above values. A 20 year design period with a 3% growth rate has been adopted. It is recommended that the project traffic engineers review and validate the above assumptions once final layouts are known.

### 7.4.4 PRELIMINARY PAVEMENT PROFILE DESIGN

The following preliminary pavement profile designs may be considered.

**Formal (sealed) car parking and internal access roads:**

**Table 4: Pavement Profile Design (5000 VPD)**

| | |
|---|---|
| **Asphalt (Wearing)** | 30 mm thick Size 10 Type H (C320) |
| **Prime coat** | Prime or Primerseal |
| **Base** | 160 mm thick VicRoads Class 2 FCR (20mm) |
| **Subbase** | 100 mm thick VicRoads Class 3 FCR (20mm) |
| **Thickness (Excluding Stabilisation)** | **290 mm** |
| **Subgrade Improvement** | 300 mm thick (minimum) In-Situ Stabilisation (Lime/Cement; CBR ≥ 15 %, $E_R$ = 150 MPa) |
| **Total Pavement Thickness** | **590 mm** |
| **Subgrade** | Unit 3 Clays or Compacted Controlled FILL (Soaked CBR = 3.0 %) |

**Informal (unsealed) car parking:**

**Table 5: Pavement Profile Design (2800 VPD)**

| | |
|---|---|
| **Sheeting Layer** | 100 mm thick Crushed Rock Sheeting Layer[1] |
| **Base** | 180 mm thick VicRoads Class 2 FCR (20mm) Placed in 2 Layers |
| **Thickness (Excluding Stabilisation)** | **280 mm** |
| **Subgrade Improvement** | 300 mm thick (minimum) In-Situ Stabilisation (Lime/Cement; CBR ≥ 15%, $E_R$ = 150 MPa) |
| **Total Pavement Thickness** | **580 mm** |
| **Subgrade** | Unit 3 Clays or Compacted Controlled FILL (Soaked CBR = 3.0%) |

[1]The sheeting layer shall comprise of crushed rock with the following minimum properties:

1. Particle Size Distribution:
    a. Passing 55 mm: 100%
    b. Passing 37.5 mm: 95-100%
    c. Passing 26.5 mm: 90-100%
    d. Passing 19 mm: 80-100%
    e. Passing 2.36 mm: 35-65%
    f. Passing 0.425 mm: 15-50%
    g. Passing 0.075 mm: 10-40%
2. Weighted Plasticity (PI x% passing 0.425) maximum 250

3. Maximum Permeability of $1x10^{-4}$ m/s
4. 4-day Soaked CBR: Minimum 40%.

Additional to the above, the crushed rock materials shall satisfy all other regular requirements for crushed rock suitable for pavement construction. Alternatively, consideration may be given to the use of a modified recycled crushed concrete with the abovementioned minimum material properties.

It must be noted that some level of maintenance of the sheeting layer will be required over the design life with patrol grading or topdressing as required. It is imperative that a maintenance works program is established to address items such as aggregate loss, pavement fatigue and potholing.

It is critical that suitable drainage (surface and subsurface) is provided for to prevent moisture ingress and surface sheet flow. If drainage conditions are not improved then early pavement fatigue/failure or more frequent maintenance will be required.

Pavement base and subbase layers are to be compacted to a dry density ratio of not less than 99% Modified and 98% Modified respectively, and moisture conditioned to within ±2% of Modified Optimum Moisture Content (MOMC). The stabilised layer must be compacted to achieve not less than 97% Standard.

### 7.4.5 SUBGRADE PREPARATION (PAVEMENTS)

It is recommended that the following procedures are adopted for subgrade preparation for pavements:

1. remove all uncontrolled fill, topsoil, loose, soft or firm soils, wet soils and soils containing significant organic matter to expose suitable natural subgrade (or controlled fill, where applicable) in a dry to damp and firm to stiff/medium dense condition or better. The subgrade shall be inspected by a geotechnical engineer or Superintendent (Hold Point)
2. complete stabilisation works per this report and compact to achieve a dry density ratio of not less than 97% Standard Compaction in accordance with AS1289 5.1.1 or 5.7.1, 5.4.1 and 5.8.1
3. proof roll the subgrade per AS3798 (2007) using a maximum five tonne static smooth drum roller under inspection of a suitably qualified geotechnical engineer (Hold Point). The subgrade shall not rut, deflect or heave. Where the subgrade does not pass proof roll, further advice shall be sought from Ground Science.

All hold points shall be released prior to the construction of the pavement. Subgrade preparation and fill placement should be carried out during dry weather conditions. Provision must be made for effective diversion and removal of all surface water from the work area.

It is recommended that subgrade preparation and compaction be performed by suitably experienced personnel and the level of compaction be checked by field density testing. Guidance for the frequency of field density testing is presented in AS3798-2007 ‘Guidelines on Earthworks for Commercial and Residential Developments’.

### 7.4.6 EFFECTS OF TREES & DRAINAGE

A suitably designed drainage system is considered critical in the performance of pavements and must place importance to prevent any moisture infiltration of the subgrade soils. Common failures in pavement profiles may result from poor backfill procedures of trench works for drainage or service assets.

It is highly recommended that all backfill procedures for service trench work is tested for compaction or work method placements validated by a qualified geotechnical engineer.

Consideration during the planning stage of trees in close proximity to pavements that may result in shrinking of the subgrade soils, causing differential settlements and pavement distress. This distance may be adjusted provided a suitably qualified arborist is commissioned to undertake the relevant assessments as necessary (varying tree specifics has varying root suction effects).

Drainage during the construction phase of the works must also be suitably managed. The timing of construction, levels of stripping and delays from the stripping phase to construction phase are all likely to contribute to further issues, if not suitably managed. All areas of the site must be suitably drained and/or graded to prevent ponding of surface water.

## 8. CLOSURE

There are several geotechnical considerations have been identified during this geotechnical investigation. These considerations can be suitably managed through the implemented recommendations of this report.

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## 9. LIMITATIONS

The advice provided in this document (as per our commission) is not designed or capable of identifying all soil conditions, (which can vary with products chosen). The advice given in this document is based on the assumption that the test results are representative of the overall soil conditions. However, it should be noted that actual conditions in some parts of the site might differ from those found. If further sampling/ testing reveals soil characteristics significantly different from those shown in our findings, Ground Science must be consulted.

The scope and the period of Ground Science services are described in the document and are subject to restrictions and limitations. Ground Science did not perform a complete assessment of all possible conditions or circumstances that may exist. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Ground Science in regards to it.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ground Science for incomplete or inaccurate data supplied by others.

It is recognised that the passage of time affects the information and assessment provided in this document. Ground Science's assessment is based on information that existed at the time of the preparation of this document. It is understood that the services provided allowed Ground Science to form no more than an opinion of the actual site conditions observed during sampling and observations of the site visit and cannot be used to assess the effects of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

## 10. REFERENCES


1. AS1289 - 2003 Testing of Soils for Engineering Purposes
2. AS1726 – 2017 Geotechnical Site Investigations
3. AS2890 – 2011 Residential Slabs and Footings
4. AS3798 – 2007 Guidelines on Earthworks for Residential and Commercial Developments
5. GeoVic Seamless Geology (2014) Map Sheet (1:250,000)
6. Austroads - 2017 Guide to Pavement Technology, Part 2: Pavement Structural Design
7. VicRoads, 2018, RC500.22, Code of Practice for Selection and Design of Pavements and Surfacings
8. Victorian Planning Authority (VPA), 2019, Engineering Design & Construction Manual.

**Appendix A**

Site & Test Location Plan


| Rev | Figure | Drawn | Date | Checked | Scale |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | Figure 1: Indicative Test Locations | AS | 16/12/2024 | AM | NTS |

**Legend**

- Indicative Borehole Location
- Indicative Machine Borehole Location
- Indicative Test Pit Location

# 1390 – 1450 WESTERN PORT HIGHWAY, CRANBOURNE SOUTH

**Prepared For:** BAPS

**Job No:** G5276

GroundScience

**APPENDIX B**

Engineering Log Sheets

## Ground Science

13 Brock Street, Thomastown VIC 3074

Phone: (03) 9464 4617


# Geotechnical Log - Testpit

## TP01

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,588.84 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,746.00 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 2 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | DCP | D | B |
| 450mm Tooth Bucket | | 0.1 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to medium grained sand, ( with root fibres ). | w < PL | H | 12 | | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey, with fine grained sand, ( trace root fibres ). | w < PL | H | 13 | | |
| | | | | | | | | | 20 | S9 | |
| | | 0.35 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled grey and orange, trace fine to coarse grained sand, ( trace root fibres ). | w < PL | VSt-H | 13 | | |
| | | | | | | | | | 8 | | |
| | | | | | | | | | 9 | | S10 |
| | | 1 | | | | | | | 9 | | |
| | | | | | | | | | 7 | | |
| | | | | | | | | | 7 | | |
| | | | | | | | | | 10 | | |
| | | | | | | | | | 12 | | |
| | | | | | | | | | 13 | | |
| | | | | | | | | | 11 | | |
| | | | | | | | | | 11 | | |
| | | 1.7 | | | | | | | 11 | | |
| | | | Rock | | SLT | Extremely weathered, Clayey GRAVEL, fine to coarse sized, with fine to coarse grained sand, pale orange brown mottled red and grey, low plasticity clay, ( mainly sedimentary rock cobbles ). | D | VD | | | |
| | | | | | | **TP01 refusal at 2m** | | | | | |



**METHOD**

- **EX** Excavator bucket
- **R** Ripper
- **HA** Hand auger
- **PT** Push tube
- **SON** Sonic drilling
- **AH** Air hammer
- **PS** Percussion sampler
- **AS** Short spiral auger
- **AD/V** Solid flight auger:V-Bit
- **AD/T** Solid flight auger:TC-Bit
- **HFA** Hollow flight auger
- **WB** Washbore drilling
- **RR** Rock roller

**PENETRATION**

- **VE** Very Easy(No Resistance)
- **E** Easy
- **F** Firm
- **H** Hard
- **VH** Very Hard(Refusal)

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

- **SPT** - Standard Penetration Test
- **PP** - Hand/Pocket Penetrometer
- **DCP** - Dynamic Cone Penetrometer
- **PSP** - Perth Sand Penetrometer
- **MC** - Moisture Content
- **PBT** - Plate Bearing Test
- **IMP** - Borehole Impression Test
- **PID** - Photo Ionisation Detector
- **VS** - Vane Shear; P=Peak, R=residual (unconnected kPa)

**SAMPLES**

- **B** - Bulk disturbed sample
- **D** - Disturbed sample
- **ES** - Environmental sample
- **U** - Thin wall tube "undisturbed"

**MOISTURE**

- **D** - Dry
- **M** - Moist
- **W** - Wet
- **PL** - plastic limit
- **LL** - liquid limit
- **W** - Moisture content

**SOIL CONSISTENCY**

- **VS** - Very soft
- **S** - Soft
- **F** - Firm
- **St** - Stiff
- **VSt** - Very stiff
- **H** - Hard

**RELATIVE DENSITY**

- **VL** - Very loose
- **L** - Loose
- **MD** - Medium dense
- **D** - Dense
- **VD** - Very dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Ground Science

**Ground Science**
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# Geotechnical Log - Testpit

## TP02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,723.65 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,731.23 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.5 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.2 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to medium grained sand, ( with root fibres ). | w ≈ PL | F-St | 2<br>3 | |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey, with fine grained sand, ( trace root fibres ). | w < PL | VSt-H | 9<br>11 | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, grey mottled orange, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres, sand pockets observed, trace weathered rock fragments ). | w > PL | St-VSt | 5<br>4<br>3<br>3<br>7<br>10 | |
| | | 1 | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, pale grey and orange, low plasticity clay, ( mainly sedimentary rock cobbles, moisture noted in between the partings, no water seepage noted ). | D | D-VD | 20+ | |
| | | 2 | | | | **TP02 refusal at 1.5m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,703.08 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,852.48 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.35 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.15 | Topsoil | | ML | Sandy SILT, low plasticity, grey, fine grained sand, with fine to medium grained sand, trace low plasticity clay, ( with root fibres ). | w < PL | VSt | 8 | |
| | | | | | | | | | 11 | |
| | | 0.3 | Inferred Murrindindi Supergroup Residual Soil | | ML | Clayey SILT, low plasticity, pale grey, with fine grained sand, ( trace root fibres ). | w < PL | H | 14 | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled grey and orange, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres, sand pockets and weathered rock fragments observed ). | w < PL | VSt-H | 10 | |
| | | | | | | | | | 10 | |
| | | | | | | | | | 9 | |
| | | | | | | | | | 9 | |
| | | | | | | | | | 9 | |
| | | | | | | | | | 8 | |
| | | 1 | | | | | | | 12 | |
| | | | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, with low plasticity clay, pale orange and grey, low plasticity clay, ( mainly sedimentary rock cobbles ). | D | D-VD | 16 | |
| | | | | | | | | | 13+DB | |
| | | | | | | **TP03 refusal at 1.35m** | | | | |
| | | 2 | | | | | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,672.32 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,924.56 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.8 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: DCP | Samples: B |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.15 | Topsoil | | ML | Sandy SILT, low plasticity, grey, fine grained sand, with low plasticity clay, ( with root fibres ). | w < PL | VSt | 4 | |
| | | | | | | | | | 6 | |
| | | 0.3 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey mottled light orange, with fine to medium grained sand, trace fine sized gravel, ( trace root fibres ). | w < PL | VSt | 9 | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled grey and orange, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres, sand pockets and weathered rock fragments observed ). | w > PL | F-St | 3 | |
| | | | | | | | | | 3 | |
| | | | | | | | | | 3 | |
| | | | | | | | | | 2 | |
| | | 1 | | | | | | | 3 | |
| | | | | | | | | | 2 | |
| | | | | | | | | | 2 | S11 |
| | | 1.1 | | | | | | | 3 | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, medium plasticity, ( sand pockets and weathered rock fragments observed ). | w ≈ PL | VSt | 4 | |
| | | | | | | | | | 5 | |
| | | 1.4 | | | | | | | 9 | |
| | | | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, with low plasticity clay, pale grey white mottled light orange. | | VD | 20+ | |
| | | 2 | | | | **TP04 refusal at 1.8m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP05

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,759.05 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,029.72 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 2.2 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | DCP | D |
| 450mm Tooth Bucket | | 0.2 | Topsoil | | ML | Sandy SILT, low plasticity, grey, fine grained sand, with fine grained sand, with low plasticity clay, ( with root fibres ). | w < PL | St | 4<br>3 | |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey mottled light orange, with fine to medium grained sand, trace fine sized gravel, ( trace root fibres ). | w < PL | VSt-H | 11<br>8 | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled grey and orange, trace fine to medium sized gravel, trace fine to coarse grained sand, ( trace root fibres, sand pockets observed ). | w > PL | St-VSt | 5<br>4<br>3<br>2<br>3<br>2<br>4<br>4<br>3<br>5<br>5 | |
| | | 1.8<br>2 | Rock | | SLT | Extremely weathered, Silty CLAY, low plasticity, white mottled orange, with fine grained sand, trace fine to coarse sized gravel. | w < PL | VSt-H | | S12 |
| | | | | | | **TP05 refusal at 2.2m** | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP06

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,679.52 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,092.06 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.45 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.1 | Topsoil | | ML | Sandy SILT, low plasticity, grey, fine grained sand, with fine grained sand, with low plasticity clay, ( with root fibres ). | w < PL | VSt | 6 | |
| | | 0.35 | Inferred Fill | | GM | Silty to sandy GRAVEL, fine to coarse sized, fine to coarse grained sand, trace low plasticity clay, grey, ( possible fill, rock cobbles encountered ). (sub-angular to angular) | D | D-VD | 14<br>DB | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled grey and orange, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres, sand pockets and weathered sedimentary rock fragments ). | w < PL | VSt-H | | |
| | | 1.1 | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, trace low plasticity clay, pale grey mottled orange. | D | D-VD | | |
| | | 2 | | | | **TP06 refusal at 1.45m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

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# Geotechnical Log - Testpit

## TP07

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,399.76 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,767.87 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 2.4 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: DCP | Samples: D | Samples: B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.2 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to medium grained sand, ( with root fibres ). | w ≈ PL | St | 3<br>4 | | |
| | | 0.55 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey, with fine to coarse grained sand, trace fine to coarse sized gravel, ( trace root fibres, trace subrounded to rounded gravels irregular shaped gravels ). | w < PL | VSt | 4<br>9<br>8 | | S13 |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled orange and grey, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres, odour noted ). | w ≈ PL | VSt | 7<br>5<br>5<br>4<br>6<br>7<br>5<br>5<br>6<br>6 | S14 | |
| | | 2 | Rock | | SLT | Extremely weathered, Silty CLAY, medium plasticity, pale grey white mottled light orange, with fine grained sand, trace fine to coarse sized gravel. | w < PL | H | | | |
| | | | | | | **TP07 refusal at 2.4m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
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# Geotechnical Log - Testpit

## TP08

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,387.52 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,890.22 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.9 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.2 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to medium grained sand, ( with root fibres ). | w ≈ PL | St | 3<br>3 | |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey, with fine to coarse grained sand, trace fine to coarse sized gravel, ( trace root fibres, trace subrounded to rounded gravels irregular shaped gravels ). | w < PL | VSt | 4<br>6 | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled orange and grey, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres ). | w ≈ PL | St-VSt | 4<br>4<br>5<br>5<br>6<br>6<br>7<br>6<br>7<br>8<br>8 | |
| | | 1.7 | Rock | | SLT | Extremely weathered, Silty CLAY, medium plasticity, pale grey white mottled light orange, with fine grained sand, trace fine to coarse sized gravel. | | H | | |
| | | 2 | | | | **TP08 refusal at 1.9m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP09

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,497.10 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,953.10 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 2.2 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.2 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to medium grained sand, ( with root fibres ). | w < PL | VSt | 7<br>5 | |
| | | 0.45 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, pale grey, with fine to coarse grained sand, trace fine to coarse sized gravel, ( trace root fibres ). | w < PL | VSt | 5<br>4<br>2 | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled orange and grey, trace fine to coarse sized gravel, trace fine to coarse grained sand, ( trace root fibres ). | w > PL | F-St | 2<br>2<br>2<br>3<br>3<br>4 | |
| | | 1.1 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, medium plasticity. | w ≈ PL | VSt | 6<br>5<br>6<br>7 | |
| | | 1.8 | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, trace low plasticity clay, pale grey yellow and white, ( mainly sedimentary rock cobbles ). | D | D-VD | | |
| | | 2 | | | | **TP09 refusal at 2.2m** | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP10

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,499.03 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,071.72 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.8 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: DCP | Samples: B |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.25 | Fill | | GW | Sandy GRAVEL, fine to coarse sized, fine to coarse grained sand, grey, ( crushed rock ). sub-angular to angular | D | D-VD | 20+ | |
| | | 0.45 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, grey, with fine to coarse grained sand, trace fine sized gravel, ( trace root fibres ). | w ≈ PL | St | | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled orange and grey, trace fine sized gravel, trace fine to coarse grained sand, ( trace root fibres ). | w > PL | St | | S15 |
| | | 1.1 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, medium plasticity, trace fine to coarse sized gravel. | w ≈ PL | VSt | | |
| | | 1.5 | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, trace low plasticity clay, pale grey yellow and white, ( mainly sedimentary rock cobbles ). | D | D-VD | | |
| | | 2 | | | | **TP10 refusal at 1.8m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Testpit

## TP11

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Excavator** | : 5t | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,414.43 | **Excavator Supplier** | : GEIS | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,123.80 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 1.9 m BGL | **Date** | : 09/10/2024 | **Loc Comment** | : |

| Excavator Attachment | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – DCP | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 450mm Tooth Bucket | | 0.25 | Fill | | SW | Gravelly SAND, fine to coarse grained, fine to coarse sized gravel, with low plasticity clay, grey brown, ( trace root fibres ). | D | MD | 7<br>5<br>3 | |
| | | 0.45 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, grey, with fine to coarse grained sand, trace fine sized gravel, ( trace root fibres ). | w ≈ PL | F-St | 2<br>3 | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, brown mottled orange and grey, trace fine sized gravel, trace fine to coarse grained sand, ( trace root fibres ). | w ≈ PL | St-VSt | 4<br>4<br>5<br>5<br>7<br>6<br>5<br>6<br>8<br>10 | |
| | | 1.5 | Rock | | SLT | Extremely weathered, Silty GRAVEL, fine to coarse sized, with fine to coarse grained sand, trace low plasticity clay, pale grey yellow and white, ( mainly sedimentary rock cobbles ). | D | D-VD | | |
| | | 2 | | | | **TP11 Terminated at 1.9m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## BH01

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,592.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,080.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 3.3 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples: Jar |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | ML | Sandy SILT, low plasticity, dark brown, fine grained sand, ( with roots). | w ≈ PL | S-F | | |
| | | 0.6 | Inferred Murrindindi Supergroup Residual Soil | | ML | Sandy SILT, low plasticity, pale grey, fine grained sand, trace low plasticity clay, ( trace root fibres). | w < PL | VSt | | |
| | | 1.1 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, yellow brown, trace fine to medium grained sand. | w ≈ PL | VSt | | S1 |
| | | 1.5 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, yellow brown mottled light grey and red, trace fine to medium sized gravel, trace fine grained sand. | w < PL | VSt | | |
| | | | Rock | | ARG | Extremely weathered, Gravelly to sandy brown mottled light grey and red, fine to coarse sized gravel, fine to coarse grained sand. | D | VSt-H | | |
| | | 2.7 | Rock | | ARG | As above, white mottled light brown and red. | D | VSt-H | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## BH01

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,592.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,080.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 3.3 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples: Jar |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | | Rock | | ARG | As above, white mottled light brown and red. | D | VSt-H | | |
| | | | | | | **BH01 refusal at 3.3m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
13 Brock Street, Thomastown VIC 3074
Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## BH02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,674.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,017.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 5 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | SM | Silty SAND, fine grained, dark grey, ( with root fibres ). | D | L | | D |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | ML | Sandy SILT, low plasticity, pale grey, fine grained sand, trace low plasticity clay, ( trace charcoal fragments). | w < PL | VSt | | |
| | | 0.7 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange brown mottled grey, ( trace root fibres ). | w ≈ PL | St-VSt | | |
| | | 1.3 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, yellow brown mottled grey. | w ≈ PL | St-VSt | | |
| | | 1.8 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, brown mottled light grey and orange. | w ≈ PL | St-VSt | | S2 |
| | | | Rock | | ARG | Extremely weathered, Sandy CLAY, medium plasticity, grey mottled brown, fine to coarse grained sand, with fine to medium sized gravel. | D | VSt-H | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
13 Brock Street, Thomastown VIC 3074
Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## BH02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,674.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,775,017.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 5 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0 | Rock | | ARG | Extremely weathered, Sandy CLAY, medium plasticity, grey mottled brown, fine to coarse grained sand, with fine to medium sized gravel. | D | VSt-H | | D |
| | | 3.2 | Rock | | ARG | As above, white mottled red. | D | VSt-H | | |
| | | 4.2 | Rock | | ARG | As above, Gravelly to sandy white and brown, fine to coarse sized gravel. | D | H | | |
| | | | | | | **BH02 Terminated at 5m** | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## BH03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,550.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,929.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 4.2 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples D | Samples Jar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | ML | Sandy SILT, low plasticity, dark grey, fine to medium grained sand, ( with root fibres ). | w < PL | S-F | | | |
| | | 0.3 | Inferred Murrindindi Supergroup Residual Soil | | ML | Sandy SILT, low plasticity, grey, fine grained sand. | w < PL | St | | | |
| | | 0.6 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange brown mottled grey, ( trace root fibres ). | w ≈ PL | St-VSt | | | |
| | | 1.2 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, brown, trace fine to coarse sized gravel, trace fine to coarse grained sand. | w ≈ PL | St-VSt | | S3 | S4 |
| | | 1.7 | Inferred Murrindindi Supergroup Residual Soil | | CL | Silty CLAY, low plasticity, brown mottled white and red, trace fine grained sand. | w < PL | St-VSt | | S5 | |
| | | 2.6 | Rock | | ARG | Extremely weathered, Gravelly to sandy CLAY, low to medium plasticity, white and brown, fine to coarse sized gravel, fine to coarse grained sand. | D | VSt-H | | | |
| | | | Rock | | ARG | As above, grey and brown, ( very slow drilling). | D | H | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

Refer to explanatory notes for details of abbreviations and basis of descriptions

Ground Science

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# Geotechnical Log - Borehole

## BH03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,550.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,929.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 4.2 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples D | Samples Jar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | | Rock | | ARG | As above, grey and brown, ( very slow drilling). | D | H | | | |
| | | | | | | **BH03 refusal at 4.2m** | | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

## Ground Science

13 Brock Street, Thomastown VIC 3074

Phone: (03) 9464 4617


# Geotechnical Log - Borehole

## BH04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,721.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,499.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 5 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples D | Samples Jar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | CL-CI | Silty CLAY, low to medium plasticity, dark grey, ( with root fibres ). | w > PL | S | | | |
| | | 0.2 | Inferred Murrindindi Supergroup Residual Soil | | CL-CI | Silty CLAY, low to medium plasticity, grey mottled brown, trace fine to medium grained sand, ( trace root fibres ). | w > PL | F-St | | | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, brown mottled grey, ( trace root fibres ). | w > PL | F-St | | | |
| | | 0.8 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, orange brown mottled grey, trace fine to coarse sized gravel. | w > PL | St-VSt | | | S6 |
| | | 1.2 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, light grey mottled brown, trace fine to coarse sized gravel, trace fine to medium grained sand. | w ≈ PL | St | | S7 | |
| | | 1.8 | Inferred Murrindindi Supergroup Residual Soil | | CL-CI | Silty CLAY, low to medium plasticity, white mottled brown, trace fine grained sand. | w ≈ PL | St-VSt | | | |
| | | 2.1 | Rock | | ARG | Extremely weathered, Gravelly to sandy CLAY, medium plasticity, white mottled brown, fine to coarse sized gravel, fine to coarse grained sand, ( slow drilling ). | D | VSt-H | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## BH04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,721.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,499.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 5 m BGL | **Date** | : 08/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples D | Samples Jar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | | Rock | | ARG | Extremely weathered, Gravelly to sandy CLAY, medium plasticity, white mottled brown, fine to coarse sized gravel, fine to coarse grained sand, ( slow drilling ). | D | VSt-H | | | |
| | | 3.4 | | | | | | | | S8 | |
| | | | Rock | | ARG | As above, light brown, ( very slow drilling ). | D | H | | | |
| | | | | | | **BH04 Terminated at 5m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
13 Brock Street, Thomastown VIC 3074
Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## BH05

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : GT10 Drilling Rig | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,520.00 | **Driller Supplier** | : Ground Science | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,768.00 | **Logged By** | : JM | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 2.2 m BGL | **Date** | : 31/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing | Samples: Jar |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | SM | Silty SAND, fine to medium grained, dark grey, ( with root fibres ). | D | L | | |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | ML | Sandy SILT, low plasticity, yellow brown mottled grey, fine to medium grained sand, trace fine to coarse sized gravel, trace medium plasticity clay. | w < PL | St | | |
| | | 0.7 | Inferred Murrindindi Supergroup Residual Soil | | CI-CH | Silty CLAY, medium to high plasticity, orange brown mottled grey, trace fine grained sand. | w < PL | VSt | | |
| | | | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange brown and grey, with fine to coarse grained sand, trace fine to coarse sized gravel. | w < PL | St-VSt | | S16 |
| | | 1.3 | Inferred Murrindindi Supergroup Residual Soil | | CI | As above, white mottled orange and brown. | w < PL | St-VSt | | |
| | | 1.8 | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, light grey and orange, with fine to coarse sized gravel, with fine to coarse grained sand. | D | VSt-H | | |
| | | | | | | **BH05 refusal at 2.2m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
13 Brock Street, Thomastown VIC 3074
Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## MB01

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : Edson 100 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,520.32 | **Driller Supplier** | : Walsh Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,699.39 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 28/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: DCP | Testing: SPT | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.2 | Topsoil | | SM | Silty SAND, fine to coarse grained, pale grey, ( with root fibres ). | D | L | 1<br>2 | | |
| | | 0.5 | Inferred Murrindindi Supergroup Residual Soil | | ML | Sandy SILT, low plasticity, grey mottled brown, fine to medium grained sand, trace fine to medium sized gravel, trace low plasticity clay, ( trace root fibres). | w < PL | St-VSt | 3<br>8<br>8 | | |
| | | 1.3 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange brown, trace fine to medium sized gravel, trace fine to coarse grained sand. | w ≈ PL | VSt-H | 12<br>13<br>15 | 4<br>8<br>14<br>(N=22) | |
| | | 2.2 | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, pale grey brown mottled yellow, trace fine to medium sized gravel, trace fine to coarse grained sand. | w < PL | VSt-H | | | |
| | | | | | | **Commenced Coring at 2.2m** | | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB01

| | | | | | |
|---|---|---|---|---|---|
| UTM | : 55H | Drill Rig | : Edson 100 | Job Number | : G5276.1 |
| Easting (m) | : 344,520.32 | Driller Supplier | : Walsh Drilling | Client | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| Northing (m) | : 5,774,699.39 | Logged By | : AS | Project | : 1390 – 1450 Western Port Highway, Cranbourne South |
| Ground Elevation | : Not Surveyed | Reviewed By | : AM | Location | : Cranbourne South VIC |
| Total Depth | : 8 m BGL | Date | : 28/10/2024 | Loc Comment | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Commenced Coring at 2.2m** | | | | | |
| NMLC ROCK CORING | | | Rock | | SLT | SILTSTONE: highly weathered, low to medium strength, pale grey mottled light orange and brown, fine grained, dry. | HW | | RQD = 56% TCR = 100%<br>RQD = 42% TCR = 100% | | P, PL, SO, STN, OP,<br>IR, RO, STN, OP, multi angular fractured zone, infilled clay and gravels ,<br>P, 5°, IR, RO, STN, OP, infilled clay and gravels ,<br>P, 10°, PL, SO, STN, OP,<br>IR, RO, STN, OP, multi angular fractured zone ,<br>P, 65°, PL, SO, STN, OP,<br>IR, RO, STN, OP, multi angular fractured zone ,<br>P, 45°, PL, SO, STN, OP,<br>P, PL, multi angular fractured zone ,<br>P, PL, SO, STN, OP,<br>P, UN, SO, STN, OP,<br>CL, OP,<br>IR, RO, STN, OP, multi angular fractured zone ,<br>P, PL,<br>P, 30°, PL,<br>P, IR, RO, STN, OP, infilled clay and gravels ,<br>IR, RO, STN, OP, multi angular fractured zone ,<br>P, PL, SO, CT, OP,<br>CL, OP,<br>P, STP, SO, CT, OP, |



**METHOD**

| | |
|---|---|
| EX | Excavator bucket |
| R | Ripper |
| HA | Hand auger |
| PT | Push tube |
| SON | Sonic drilling |
| AH | Air hammer |
| PS | Percussion sampler |
| AS | Short spiral auger |
| AD/V | Solid flight auger:V-Bit |
| AD/T | Solid flight auger:TC-Bit |
| HFA | Hollow flight auger |
| WB | Washbore drilling |
| RR | Rock roller |

**PENETRATION**

| | |
|---|---|
| VE | Very Easy(No Resistance) |
| E | Easy |
| F | Firm |
| H | Hard |
| VH | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| SPT | - Standard Penetration Test |
| PP | - Hand/Pocket Penetrometer |
| DCP | - Dynamic Cone Penetrometer |
| PSP | - Perth Sand Penetrometer |
| MC | - Moisture Content |
| PBT | - Plate Bearing Test |
| IMP | - Borehole Impression Test |
| PID | - Photo Ionisation Detector |
| VS | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| B | - Bulk disturbed sample |
| D | - Disturbed sample |
| ES | - Environmental sample |
| U | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| D | - Dry |
| M | - Moist |
| W | - Wet |
| PL | - plastic limit |
| LL | - liquid limit |
| W | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| VS | - Very soft |
| S | - Soft |
| F | - Firm |
| St | - Stiff |
| VSt | - Very stiff |
| H | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| VL | - Very loose |
| L | - Loose |
| MD | - Medium dense |
| D | - Dense |
| VD | - Very dense |

Refer to explanatory notes for details of abbreviations and basis of descriptions

Ground Science

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13 Brock Street, Thomastown VIC 3074
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# Geotechnical Log - Borehole

## MB01

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : Edson 100 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,520.32 | **Driller Supplier** | : Walsh Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,699.39 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 28/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength | RQD% and TCR% | Defect Spacing (mm) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NMLC ROCK CORING | | | Rock | | SLT | SILTSTONE: distinctly weathered, low strength, mottled brown pale grey, fine grained, dry, ( highly fractured, closely packed partings, core jammed at 5.16m). | DW | VLS LS MS HS VHS EHS | RQD = 42% TCR = 100% | 30 100 300 1000 3000 | IR, RO, STN, OP, multi angular fractured zone , |
| | | | | | | | | | | | IR, RO, STN, OP, multi angular fractured zone, infilled clay and gravels , |
| | | | Rock | | SLT | SILTSTONE: highly to moderately weathered, medium to high strength, grey mottled brown, fine grained, dry. | HW-MW | | RQD = 32% TCR = 100% | | |
| | | | | | | | | | | | CL, OP, |
| | | | | | | | | | | | P, 15°, PL, SO, STN, OP, |
| | | | | | | | | | | | P, 10°, IR, RO, STN, OP, |
| | | | | | | | | | | | P, 45°, PL, SO, STN, OP, |
| | | | | | | | | | | | IR, STN, OP, multi angular fractured zone , |
| | | | Rock | | SLT | SILTSTONE: moderately to slightly weathered, high strength, dark grey mottled brown, fine grained, dry. | MW-SW | | RQD = 61% TCR = 100% | | |
| | | | | | | | | | | | IR, RO, CT, OP, multi angular fractured zone, infilled clay and gravels , |
| | | | | | | | | | | | RO, CL, OP, |
| | | | | | | | | | | | P, PL, SO, STN, OP, |
| | | | | | | | | | RQD = 100% TCR = 100% | | P, 10°, PL, SO, STN, OP, |
| | | | | | | | | | | | IR, CL, OP, |
| | | | | | | **MB01 Terminated at 8m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : Edson 100 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,452.23 | **Driller Supplier** | : Walsh Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,707.24 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 7.5 m BGL | **Date** | : 28/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing – SPT | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.1 | Topsoil | | ML | Clayey SILT, low plasticity, grey, with fine to coarse grained sand, ( with root fibres). | w > PL | F | | |
| | | 0.6 | Fill | | CL-CI | Silty CLAY, low to medium plasticity, with fine to coarse grained sand, trace fine to coarse sized gravel, brown mottled orange and grey, ( trace root fibres and organic inclusions ). | w > PL | F-St | | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | ML | Clayey SILT, low plasticity, dark grey, with fine to coarse grained sand, ( trace root fibres, low rate water seepage observed ). | w ≈ LL | VS-S | | |
| | | 2 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange brown mottled pale grey, trace fine to coarse grained sand. | w > PL | F | 2<br>4<br>4<br>(N=8) | |
| | | 3 | Inferred Murrindindi Supergroup Residual Soil | | CI | Silty CLAY, medium plasticity, orange mottled pale grey, with fine to coarse grained sand, trace fine to coarse sized gravel, ( sand pockets and weathered rock fragments observed ). | w ≈ PL | VSt | 5<br>10<br>20<br>(N=30<br>) | |
| | | 4.2 | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, pale grey white, with fine to coarse sized gravel, with fine to coarse grained sand. | w < PL | H | 14<br>10/50mm<br>(N=) | |
| | | | | | | **Commenced Coring at 4.2m** | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : Edson 100 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,452.23 | **Driller Supplier** | : Walsh Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,707.24 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 7.5 m BGL | **Date** | : 28/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Commenced Coring at 4.2m** | | | | | |
| NMLC ROCK CORING | | | Rock | | SLT | SILTSTONE: distinctly weathered, low strength, pale grey mottled light brown, fine grained, dry. | DW | | RQD = 0% TCR = 100% | | multi angular highly fractured zone, infilled clay, sand and gravel , |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

## Ground Science

13 Brock Street, Thomastown VIC 3074

Phone: (03) 9464 4617


# Geotechnical Log - Borehole

## MB02

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : Edson 100 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,452.23 | **Driller Supplier** | : Walsh Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,707.24 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 7.5 m BGL | **Date** | : 28/10/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NMLC ROCK CORING | | | Rock | | SLT | SILTSTONE: highly weathered, low to medium strength, mottled brown grey, fine grained, dry, (core jammed at 6.5m). | HW | | RQD = 0% TCR = 100%<br>RQD = 0% TCR = 100%<br>RQD = 0% TCR = 100% | | multi angular highly fractured zone, infilled clay and gravels ,<br>multi angular highly fractured zone , |
| | | | | | | **MB02 Terminated at 7.5m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
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# Geotechnical Log - Borehole

## MB03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,547.58 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,617.39 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: SPT | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.2 | Topsoil | | ML | SILT, low plasticity, grey, ( with root fibres). | w < PL | F | | |
| | | 0.4 | Inferred Murrindindi Supergroup Residual Soil | | ML | Clayey SILT, low plasticity, pale grey brown, trace fine grained sand, ( trace root fibres). | w > PL | F | | |
| | | 1 | Inferred Murrindindi Supergroup Residual Soil | | CL-Cl | Silty CLAY, low to medium plasticity, orange brown mottled grey, trace fine to coarse sized gravel, trace fine to coarse grained sand. | w > PL | St | | |
| | | 1.4 | Inferred Murrindindi Supergroup Residual Soil | | CL-Cl | As above, ( weathered rock fragments observed ). | w ≈ PL | VSt | | |
| | | 1.8 | Inferred Murrindindi Supergroup Residual Soil | | CL-Cl | As above. | w < PL | VSt | 6<br>10<br>22<br>(N=32) | |
| | | | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, pale orange brown mottled white, with fine to coarse sized gravel, with fine to coarse grained sand. | w < PL | H | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## MB03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,547.58 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,617.39 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: SPT | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 6 | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, pale orange brown mottled white, with fine to coarse sized gravel, with fine to coarse grained sand. | w < PL | H | | |
| | | 7 | Rock | | SLT | Extremely weathered, Silty to sandy GRAVEL, fine to coarse sized, fine to coarse grained sand, with low plasticity clay, brown. | D | VD | | |
| | | | | | | **Commenced Coring at 7m** | | | | |



**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB03

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,547.58 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,617.39 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | | | | **Commenced Coring at 7m** | | | | | |
| NMLC ROCK CORING | | 7 | Rock | | SLT | SILTSTONE: moderately weathered, medium strength, orange brown mottled grey, fine to coarse grained, dry. | MW | | RQD = 35%<br>TCR = 100% | | IR, RO, STN, OP, multi angular fractured zone ,<br>IR, RO, STN, OP, multi angular fractured zone , |
| | | 9 | | | | **MB03 Terminated at 8m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,445.71 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,627.49 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Moisture | Consistency/Density | Testing: SPT | Samples |
|---|---|---|---|---|---|---|---|---|---|---|
| 100mm AD/V | | 0.2 | Topsoil | | ML | SILT, low plasticity, grey, ( with root fibres). | w < PL | F | | |
| | | 0.5 | Inferred Murrindindi Supergroup Residual Soil | | ML | Clayey SILT, low plasticity, pale grey brown, with fine to medium grained sand, ( trace root fibres). | w < PL | F-St | | |
| | | 1.3 | Inferred Murrindindi Supergroup Residual Soil | | CL-Cl | Silty CLAY, low to medium plasticity, orange brown mottled grey, trace fine to coarse sized gravel, trace fine to coarse grained sand. | w ≈ PL | St-VSt | 5<br>8<br>14<br>(N=22) | |
| | | 1.5 | Inferred Murrindindi Supergroup Residual Soil | | CL-Cl | As above, ( weathered rock fragments observed ). | w < PL | VSt | | |
| | | | Rock | | SLT | Extremely weathered, Clayey SILT, low plasticity, pale grey white, with fine to coarse sized gravel, with fine to coarse grained sand. | w < PL | H | | |
| | | 4.5 | | | | **Commenced Coring at 4.5m** | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

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# Geotechnical Log - Borehole

## MB04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,445.71 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,627.49 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4 | | | | **Commenced Coring at 4.5m** | | | | | |
| NMLC ROCK CORING | | | Rock | | SLT | SILTSTONE: distinctly to highly weathered, very low to low strength, mottled and white brown pale grey, fine to coarse grained, dry, ( core jammed at 5.3 m). | DW-HW | | RQD = 0%<br>TCR = 19% | | IR, RO, STN, OP, multi angular fractured zone , |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**Ground Science**
13 Brock Street, Thomastown VIC 3074
Phone: (03) 9464 4617

# Geotechnical Log - Borehole

## MB04

| | | | | | |
|---|---|---|---|---|---|
| **UTM** | : 55H | **Drill Rig** | : CE180 | **Job Number** | : G5276.1 |
| **Easting (m)** | : 344,445.71 | **Driller Supplier** | : GEM Drilling | **Client** | : Urbis c/-BAPS Swaminarayan Sanstha Australia LTD |
| **Northing (m)** | : 5,774,627.49 | **Logged By** | : AS | **Project** | : 1390 – 1450 Western Port Highway, Cranbourne South |
| **Ground Elevation** | : Not Surveyed | **Reviewed By** | : AM | **Location** | : Cranbourne South VIC |
| **Total Depth** | : 8 m BGL | **Date** | : 12/12/2024 | **Loc Comment** | : |

| Drilling Method | Water | Depth (m) | Soil Origin | Graphic Log | Classification Code | Material Description | Weathering | Estimated Strength (VLS, LS, MS, HS, VHS, EHS) | RQD% and TCR% | Defect Spacing (mm) (30, 100, 300, 1000, 3000) | Defect Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NMLC ROCK CORING | | 5.5 | Rock | | SLT | SILTSTONE: distinctly to highly weathered, very low to low strength, mottled and white brown pale grey, fine to coarse grained, dry, ( core jammed at 5.3 m). | DW-HW | | RQD = 0%<br>TCR = 19% | | |
| | | 6 | Rock | | SLT | SILTSTONE: distinctly weathered, very low strength, pale grey mottled white and brown, fine to coarse grained, dry, ( significant core loss observed, material tending to extremely weathered rock ). | DW | | RQD = 0%<br>TCR = 19% | | IR, RO, STN, OP, multi angular fractured zone,<br>CORELOSS, Core Loss (notes), |
| | | 7 | Rock | | SLT | SILTSTONE: highly weathered, low to medium strength, orange brown mottled grey, fine to coarse grained, dry. | HW | | RQD = 0%<br>TCR = 100% | | IR, RO, STN, OP, |
| | | 9 | | | | **MB04 Terminated at 8m** | | | | | |

**METHOD**

| | |
|---|---|
| **EX** | Excavator bucket |
| **R** | Ripper |
| **HA** | Hand auger |
| **PT** | Push tube |
| **SON** | Sonic drilling |
| **AH** | Air hammer |
| **PS** | Percussion sampler |
| **AS** | Short spiral auger |
| **AD/V** | Solid flight auger:V-Bit |
| **AD/T** | Solid flight auger:TC-Bit |
| **HFA** | Hollow flight auger |
| **WB** | Washbore drilling |
| **RR** | Rock roller |

**PENETRATION**

| | |
|---|---|
| **VE** | Very Easy(No Resistance) |
| **E** | Easy |
| **F** | Firm |
| **H** | Hard |
| **VH** | Very Hard(Refusal) |

**WATER**

- Water Level on Date
- Water inflow
- Water outflow

**FIELD TESTS**

| | |
|---|---|
| **SPT** | - Standard Penetration Test |
| **PP** | - Hand/Pocket Penetrometer |
| **DCP** | - Dynamic Cone Penetrometer |
| **PSP** | - Perth Sand Penetrometer |
| **MC** | - Moisture Content |
| **PBT** | - Plate Bearing Test |
| **IMP** | - Borehole Impression Test |
| **PID** | - Photo Ionisation Detector |
| **VS** | - Vane Shear; P=Peak, R=residual (unconnected kPa) |

**SAMPLES**

| | |
|---|---|
| **B** | - Bulk disturbed sample |
| **D** | - Disturbed sample |
| **ES** | - Environmental sample |
| **U** | - Thin wall tube "undisturbed" |

**MOISTURE**

| | |
|---|---|
| **D** | - Dry |
| **M** | - Moist |
| **W** | - Wet |
| **PL** | - plastic limit |
| **LL** | - liquid limit |
| **W** | - Moisture content |

**SOIL CONSISTENCY**

| | |
|---|---|
| **VS** | - Very soft |
| **S** | - Soft |
| **F** | - Firm |
| **St** | - Stiff |
| **VSt** | - Very stiff |
| **H** | - Hard |

**RELATIVE DENSITY**

| | |
|---|---|
| **VL** | - Very loose |
| **L** | - Loose |
| **MD** | - Medium dense |
| **D** | - Dense |
| **VD** | - Very dense |

**Refer to explanatory notes for details of abbreviations and basis of descriptions**

Ground Science

**APPENDIX C**

Laboratory Test Results

# Material Test Report

Ground Science Pty Ltd
Ground Science Laboratory
13 Brock Street Thomastown Victoria 3074
Phone: (03) 9464 4617
Email: tim@groundscience.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tim Senserrick
Laboratory Manager
NATA Accredited Laboratory Number: 15055

**Report Number:** **G5276.1 AA -1**
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

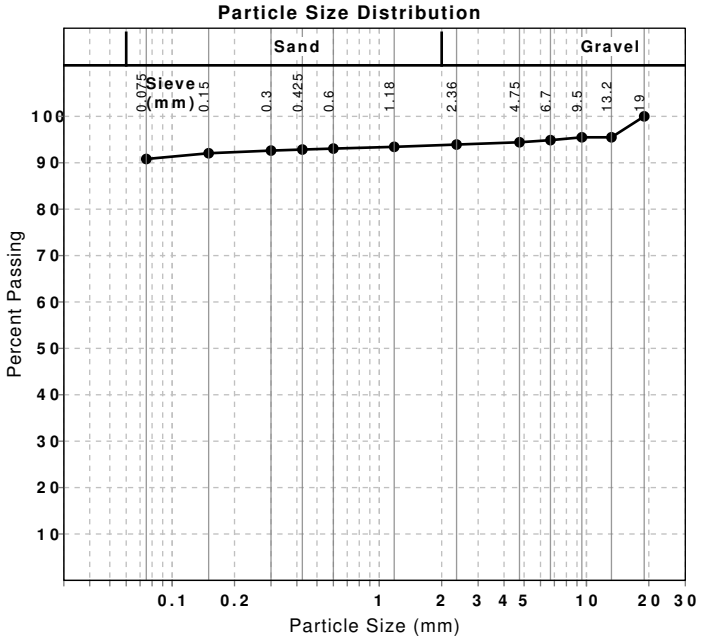
**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S7
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 23/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **BH04 (1.3 - 1.5m)**
**Material:** CLAY, medium plasticity, yellow/brown, trace sand, trace gravel

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **95** | | | 5 | | |
| 9.5 mm | **95** | | | 0 | | |
| 6.7 mm | **95** | | | 1 | | |
| 4.75 mm | **94** | | | 0 | | |
| 2.36 mm | **94** | | | 0 | | |
| 1.18 mm | **93** | | | 0 | | |
| 0.6 mm | **93** | | | 0 | | |
| 0.425 mm | **93** | | | 0 | | |
| 0.3 mm | **93** | | | 0 | | |
| 0.15 mm | **92** | | | 1 | | |
| 0.075 mm | **91** | | | 1 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 23.5 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 41 | | |
| Plastic Limit (%) | 20 | | |
| **Plasticity Index (%)** | **21** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **5.5** | | |
| Cracking Crumbling Curling | Cracking | | |



# Material Test Report

**Report Number:** G5276.1 AA -1
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S9
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 23/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP01 (0.15 - 0.3m)**
**Material:** CLAY, low plasticity, grey, trace sand, trace gravel

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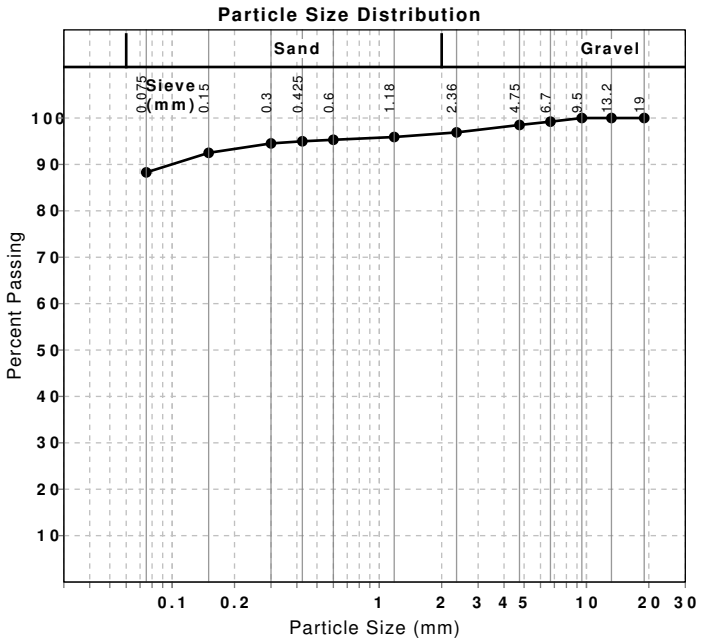
Laboratory Manager
NATA Accredited Laboratory Number: 15055

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **100** | | | 0 | | |
| 9.5 mm | **100** | | | 0 | | |
| 6.7 mm | **99** | | | 1 | | |
| 4.75 mm | **98** | | | 1 | | |
| 2.36 mm | **97** | | | 2 | | |
| 1.18 mm | **96** | | | 1 | | |
| 0.6 mm | **95** | | | 1 | | |
| 0.425 mm | **95** | | | 0 | | |
| 0.3 mm | **95** | | | 0 | | |
| 0.15 mm | **93** | | | 2 | | |
| 0.075 mm | **88** | | | 4 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 5.9 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 20 | | |
| Plastic Limit (%) | 13 | | |
| **Plasticity Index (%)** | **7** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **1.5** | | |
| Cracking Crumbling Curling | Cracking | | |



# Material Test Report

**Report Number:** G5276.1 AA -1
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S10
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 22/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP01 (0.5 - 0.7m)**
**Material:** CLAY, high plasticity, brown, trace sand

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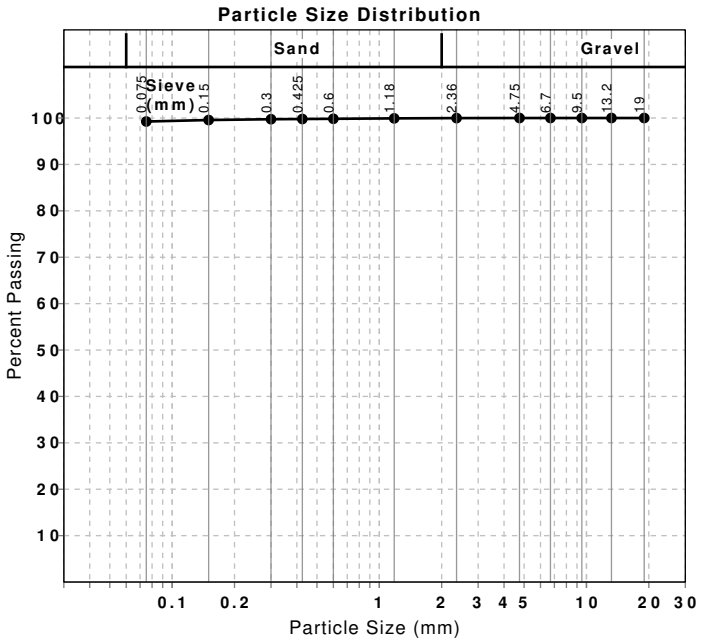
Laboratory Manager
NATA Accredited Laboratory Number: 15055

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **100** | | | 0 | | |
| 9.5 mm | **100** | | | 0 | | |
| 6.7 mm | **100** | | | 0 | | |
| 4.75 mm | **100** | | | 0 | | |
| 2.36 mm | **100** | | | 0 | | |
| 1.18 mm | **100** | | | 0 | | |
| 0.6 mm | **100** | | | 0 | | |
| 0.425 mm | **100** | | | 0 | | |
| 0.3 mm | **100** | | | 0 | | |
| 0.15 mm | **100** | | | 0 | | |
| 0.075 mm | **99** | | | 0 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 22.5 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 52 | | |
| Plastic Limit (%) | 22 | | |
| **Plasticity Index (%)** | **30** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **6.0** | | |
| Cracking Crumbling Curling | Cracking | | |



# Material Test Report

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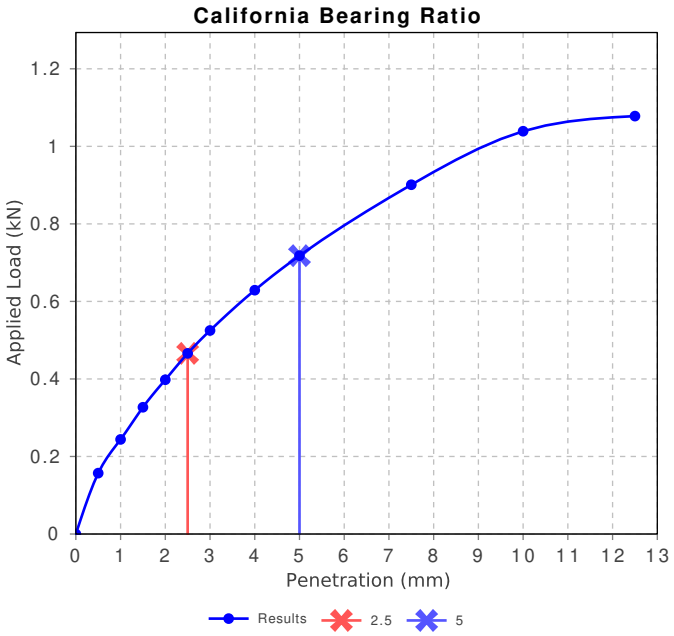
Approved Signatory: Tim Senserrick
Laboratory Manager
NATA Accredited Laboratory Number: 15055

**Report Number:** **G5276.1 AA -1**
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S10
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 29/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP01 (0.5 - 0.7m)**
**Material:** CLAY, high plasticity, brown, trace sand

| California Bearing Ratio (AS 1289 6.1.1 & 2.1.1) | | Min | Max |
|---|---|---|---|
| CBR taken at | 5 mm | | |
| CBR % | **3.5** | | |
| Method of Compactive Effort | Standard | | |
| Method used to Determine MDD | AS 1289 5.1.1 & 2.1.1 | | |
| Method used to Determine Plasticity | Visual Assessment | | |
| Maximum Dry Density (t/m$^3$) | 1.53 | | |
| Optimum Moisture Content (%) | 26.5 | | |
| Laboratory Density Ratio (%) | 98.0 | | |
| Laboratory Moisture Ratio (%) | 99.0 | | |
| Dry Density after Soaking (t/m$^3$) | 1.49 | | |
| Field Moisture Content (%) | 22.5 | | |
| Moisture Content at Placement (%) | 26.0 | | |
| Moisture Content Top 30mm (%) | 29.1 | | |
| Moisture Content Rest of Sample (%) | 29.2 | | |
| Mass Surcharge (kg) | 4.5 | | |
| Soaking Period (days) | 4 | | |
| Curing Hours | 168.2 | | |
| Swell (%) | 1.0 | | |
| Oversize Material (mm) | 19 | | |
| Oversize Material Included | Excluded | | |
| Oversize Material (%) | 0.0 | | |



# Material Test Report

**Report Number:** G5276.1 AA -1
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S11
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 22/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP04 (0.8 - 1.1m)**
**Material:** CLAY, high plasticity, mottled brown, trace sand

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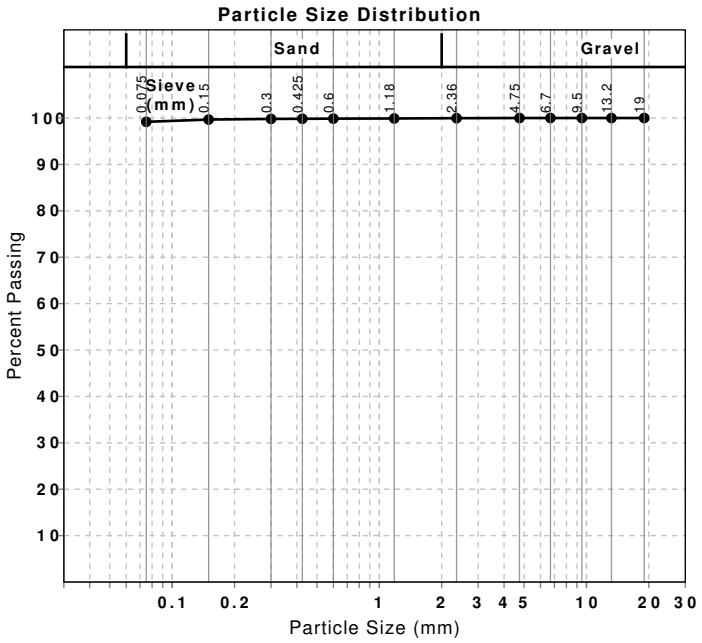
Laboratory Manager
NATA Accredited Laboratory Number: 15055

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **100** | | | 0 | | |
| 9.5 mm | **100** | | | 0 | | |
| 6.7 mm | **100** | | | 0 | | |
| 4.75 mm | **100** | | | 0 | | |
| 2.36 mm | **100** | | | 0 | | |
| 1.18 mm | **100** | | | 0 | | |
| 0.6 mm | **100** | | | 0 | | |
| 0.425 mm | **100** | | | 0 | | |
| 0.3 mm | **100** | | | 0 | | |
| 0.15 mm | **100** | | | 0 | | |
| 0.075 mm | **99** | | | 0 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 30.2 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 67 | | |
| Plastic Limit (%) | 26 | | |
| **Plasticity Index (%)** | **41** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **7.0** | | |
| Cracking Crumbling Curling | Cracking | | |



# Material Test Report

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**Report Number:** **G5276.1 AA -1**
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

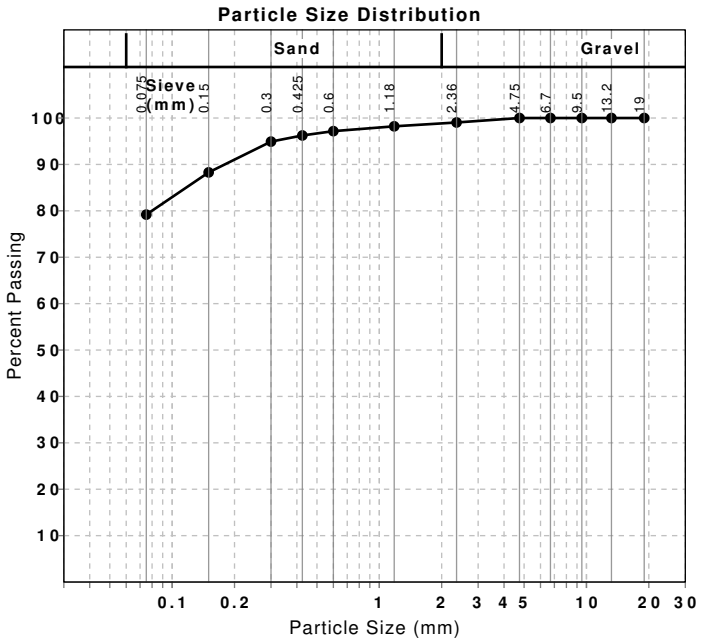
**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S13
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 22/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP07 (0.3 - 0.5m)**
**Material:** CLAY/SILT, low plasticity, grey, with sand, trace gravel

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **100** | | | 0 | | |
| 9.5 mm | **100** | | | 0 | | |
| 6.7 mm | **100** | | | 0 | | |
| 4.75 mm | **100** | | | 0 | | |
| 2.36 mm | **99** | | | 1 | | |
| 1.18 mm | **98** | | | 1 | | |
| 0.6 mm | **97** | | | 1 | | |
| 0.425 mm | **96** | | | 1 | | |
| 0.3 mm | **95** | | | 1 | | |
| 0.15 mm | **88** | | | 7 | | |
| 0.075 mm | **79** | | | 9 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 9.1 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 23 | | |
| Plastic Limit (%) | 18 | | |
| **Plasticity Index (%)** | **5** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **1.0** | | |
| Cracking Crumbling Curling | Cracking | | |



# Material Test Report

**Report Number:** G5276.1 AA -1
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S15
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 22/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP10 (0.6 - 0.8m)**
**Material:** CLAY, high plasticity, mottled brown, trace sand

Ground Science Pty Ltd
Ground Science Laboratory
13 Brock Street Thomastown Victoria 3074
Phone: (03) 9464 4617
Email: tim@groundscience.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

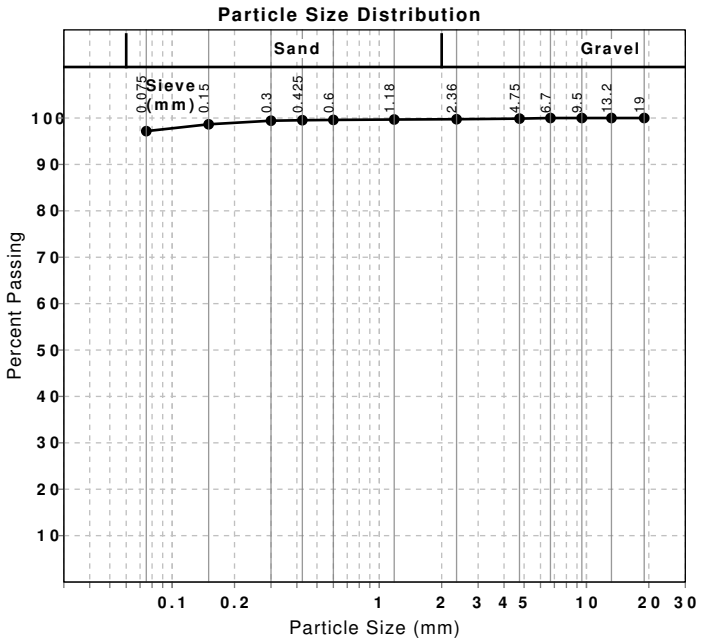
Approved Signatory: Tim Senserrick
Laboratory Manager
NATA Accredited Laboratory Number: 15055

| Particle Size Distribution (AS1289 3.6.1) | | | | | | |
|---|---|---|---|---|---|---|
| Sieve | Passed % | Passing Limits | | Retained % | Retained Limits | |
| 19 mm | **100** | | | 0 | | |
| 13.2 mm | **100** | | | 0 | | |
| 9.5 mm | **100** | | | 0 | | |
| 6.7 mm | **100** | | | 0 | | |
| 4.75 mm | **100** | | | 0 | | |
| 2.36 mm | **100** | | | 0 | | |
| 1.18 mm | **100** | | | 0 | | |
| 0.6 mm | **100** | | | 0 | | |
| 0.425 mm | **100** | | | 0 | | |
| 0.3 mm | **99** | | | 0 | | |
| 0.15 mm | **99** | | | 1 | | |
| 0.075 mm | **97** | | | 1 | | |

| Moisture Content (AS1289.2.1.1) | | Min | Max |
|---|---|---|---|
| Moisture Content (%) | 22.3 | | |

| Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) | | Min | Max |
|---|---|---|---|
| Sample History | Oven Dried | | |
| Preparation Method | Dry Sieve | | |
| Liquid Limit (%) | 54 | | |
| Plastic Limit (%) | 23 | | |
| **Plasticity Index (%)** | **31** | | |

| Linear Shrinkage (AS1289 3.4.1) | | Min | Max |
|---|---|---|---|
| Moisture Condition Determined By | AS 1289.3.1.2 | | |
| Linear Shrinkage (%) | **7.0** | | |
| Cracking Crumbling Curling | Cracking | | |




ADVERTISED PLAN

# Material Test Report

Ground Science Pty Ltd
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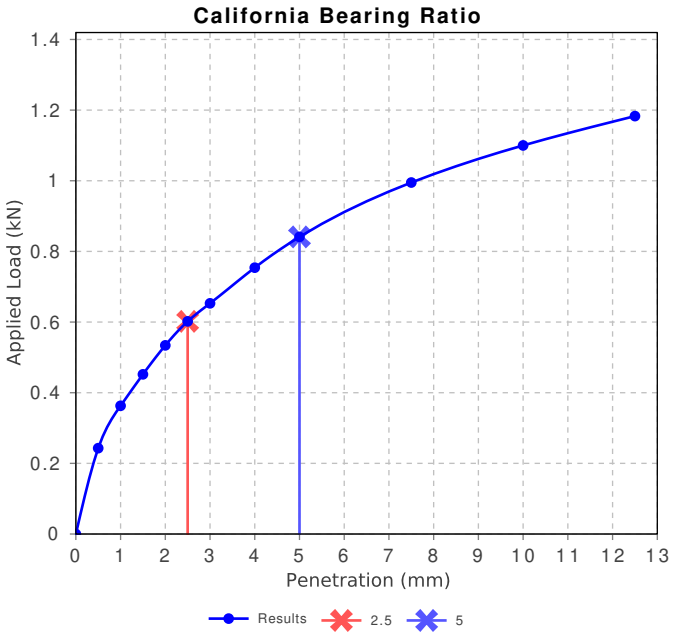
Approved Signatory: Tim Senserrick
Laboratory Manager
NATA Accredited Laboratory Number: 15055

**Report Number:** **G5276.1 AA -1**
**Issue Number:** 1
**Date Issued:** 30/10/2024
**Client:** Urbis c/-BAPS Swaminarayan Sanstha Australia LTD

**Project Number:** G5276.1 AA
**Project Name:** 1390 – 1450 Western Port Highway, Cranbourne South
**Project Location:** Cranbourne South VIC
**Work Request:** 20558
**Sample Number:** 5276.1-S15
**Date Sampled:** 11/10/2024
**Dates Tested:** 11/10/2024 - 29/10/2024
**Sampling Method:** AS 1289.1.2.1 6.5.3 - Power auger drilling
**Sample Location:** **TP10 (0.6 - 0.8m)**
**Material:** CLAY, high plasticity, mottled brown, trace sand

| California Bearing Ratio (AS 1289 6.1.1 & 2.1.1) | | Min | Max |
|---|---|---|---|
| CBR taken at | 2.5 mm | | |
| CBR % | **4.5** | | |
| Method of Compactive Effort | Standard | | |
| Method used to Determine MDD | AS 1289 5.1.1 & 2.1.1 | | |
| Method used to Determine Plasticity | Visual Assessment | | |
| Maximum Dry Density (t/m$^3$) | 1.53 | | |
| Optimum Moisture Content (%) | 26.0 | | |
| Laboratory Density Ratio (%) | 97.5 | | |
| Laboratory Moisture Ratio (%) | 101.5 | | |
| Dry Density after Soaking (t/m$^3$) | 1.48 | | |
| Field Moisture Content (%) | 29.2 | | |
| Moisture Content at Placement (%) | 26.2 | | |
| Moisture Content Top 30mm (%) | 28.8 | | |
| Moisture Content Rest of Sample (%) | 27.9 | | |
| Mass Surcharge (kg) | 4.5 | | |
| Soaking Period (days) | 4 | | |
| Curing Hours | 168.2 | | |
| Swell (%) | 1.0 | | |
| Oversize Material (mm) | 19 | | |
| Oversize Material Included | Excluded | | |
| Oversize Material (%) | 0.0 | | |



# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **EM2417638** | Page | : 1 of 3 |
| Client | : **GROUND SCIENCE PTY LTD** | Laboratory | : Environmental Division Melbourne |
| Contact | : ANTON MANOJ | Contact | : Peter Ravlic |
| Address | : 13 BROCK STREET<br>THOMASTOWN VICTORIA, AUSTRALIA 3074 | Address | : 4 Westall Rd Springvale VIC Australia 3171 |
| Telephone | : ---- | Telephone | : +6138549 9645 |
| Project | : G5276.1 AA | Date Samples Received | : 11-Oct-2024 14:15 |
| Order number | : Geot2009 | Date Analysis Commenced | : 14-Oct-2024 |
| C-O-C number | : ---- | Issue Date | : 18-Oct-2024 13:16 |
| Sampler | : JM | | |
| Site | : Cranbourne South | | |
| Quote number | : EN/222 | | |
| No. of samples received | : 3 | | |
| No. of samples analysed | : 3 | | |

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Eric Chau | Metals Team Leader | Melbourne Inorganics, Springvale, VIC |

## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

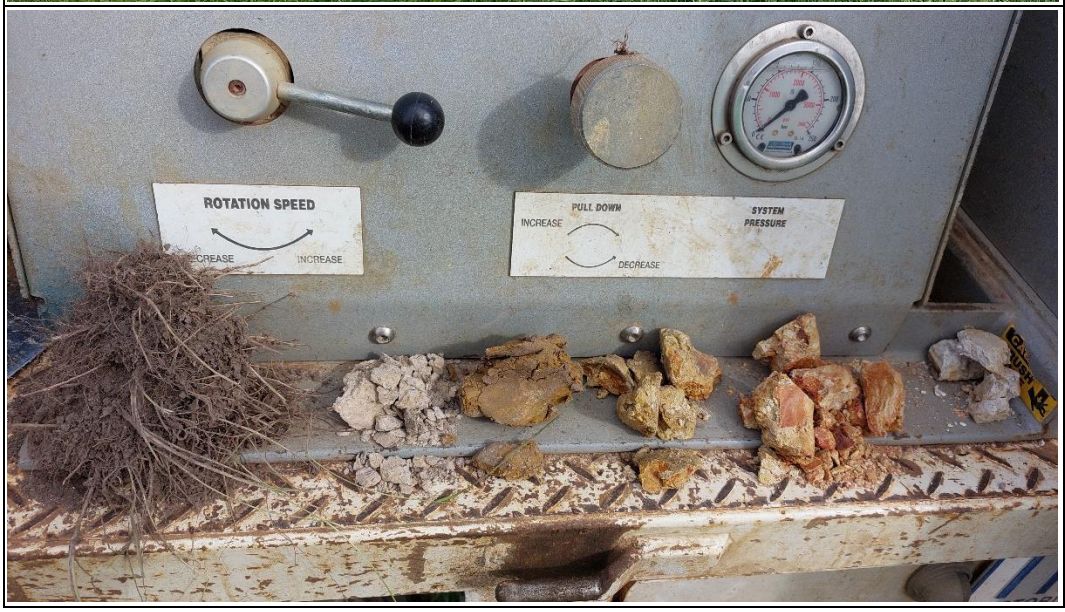
- Corrosion assessment for Concrete and Steel piles in soil per Australian Standard AS2159-2009 uses a combination of soil and groundwater data (Tables 6.4.2 C & 6.5.2 C). In the absence of groundwater data, assessment has been made against soil criteria only. Refer to AS2159-2009 section 6.4 for further interpretation of corrosion assessment. ALS is not NATA accredited for Corrosion Assessment comments
- EA167: Soil Condition A – High permeability soils (e.g. sands and gravels) which are in groundwater
- EA167: Soil Condition B – Low permeability soils (e.g. silts and clays) or all soils above groundwater
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

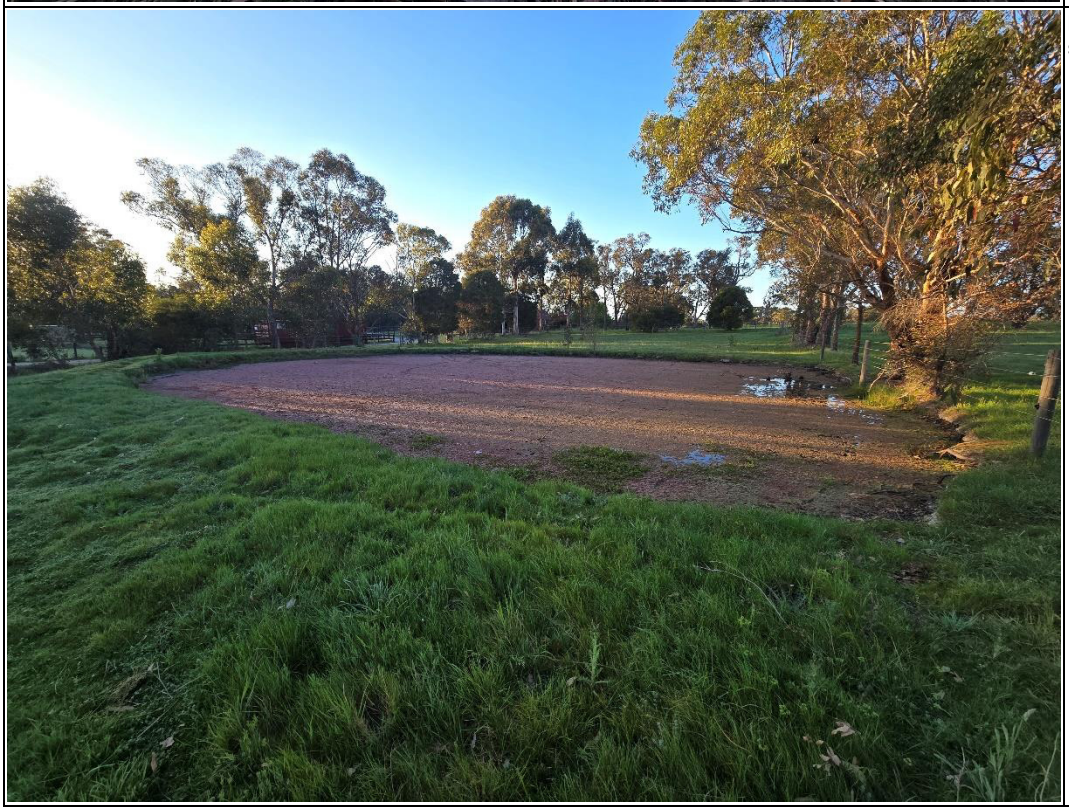
## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | BH01: 0.95m - 1.0m | BH03: 0.95m - 1.0m | BH04: 0.95m - 1.0m | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 08-Oct-2024 00:00 | 08-Oct-2024 00:00 | 08-Oct-2024 00:00 | ---- | ---- |
| Compound | CAS Number | LOR | Unit | EM2417638-001 | EM2417638-002 | EM2417638-003 | -------- | -------- |
| | | | | Result | Result | Result | ---- | ---- |
| **EA002: pH 1:5 (Soils)** | | | | | | | | |
| pH Value | ---- | 0.1 | pH Unit | 6.2 | 5.9 | 5.6 | ---- | ---- |
| **EA010: Conductivity (1:5)** | | | | | | | | |
| Electrical Conductivity @ 25°C | ---- | 1 | µS/cm | 146 | 142 | 87 | ---- | ---- |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| Moisture Content | ---- | 0.1 | % | 22.6 | 20.6 | 24.5 | ---- | ---- |
| **EA080: Resistivity** | | | | | | | | |
| Resistivity at 25°C | ---- | 1 | ohm cm | 6850 | 7040 | 11500 | ---- | ---- |
| **EA167: Corrosion Classification (per AS2159-2009)** | | | | | | | | |
| ø Exposure Classification - Concrete Piles Soil Condition A | ---- | - | - | Mild | Mild | Mild | ---- | ---- |
| ø Exposure Classification - Concrete Piles Soil Condition B | ---- | - | - | Non Aggressive | Non Aggressive | Non Aggressive | ---- | ---- |
| ø Exposure Classification - Steel Piles Soil Condition A | ---- | - | - | Non Aggressive | Non Aggressive | Non Aggressive | ---- | ---- |
| ø Exposure Classification - Steel Piles Soil Condition B | ---- | - | - | Non Aggressive | Non Aggressive | Non Aggressive | ---- | ---- |
| **ED040S: Soluble Major Anions** | | | | | | | | |
| Sulfate as SO4 2- | 14808-79-8 | 10 | mg/kg | 100 | 140 | 60 | ---- | ---- |
| **ED045G: Chloride by Discrete Analyser** | | | | | | | | |
| Chloride | 16887-00-6 | 10 | mg/kg | 180 | 140 | 120 | ---- | ---- |

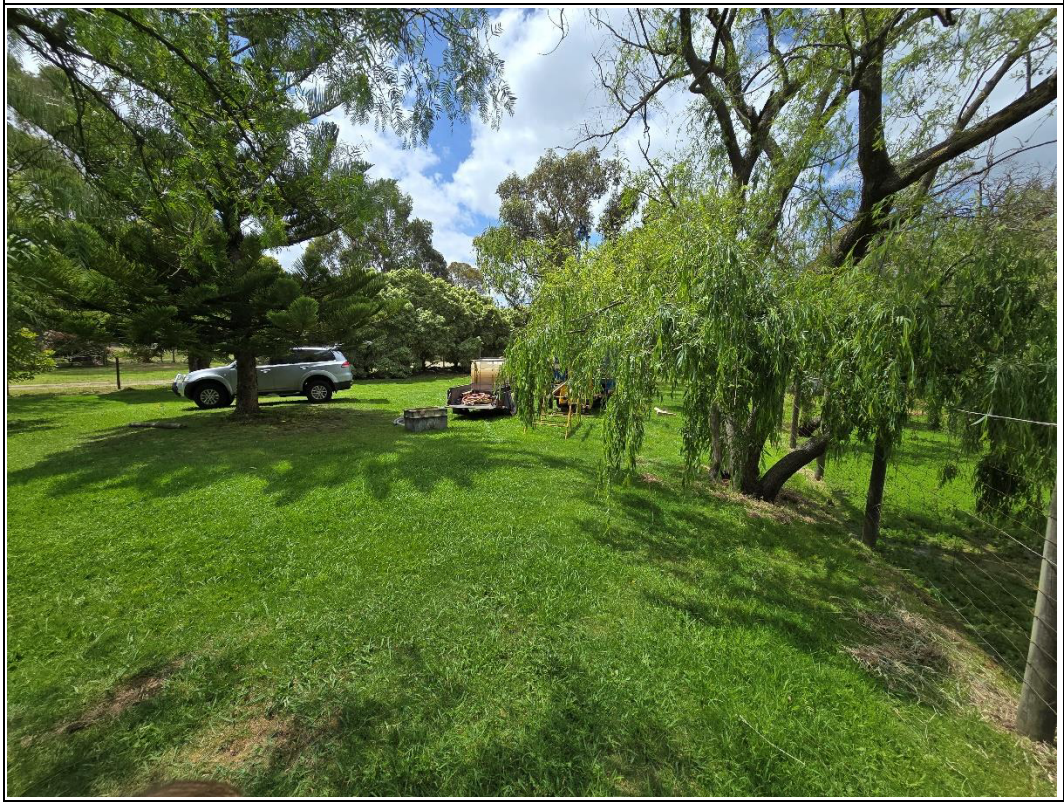
**APPENDIX D**

Site Photographs

| | |
|---|---|
|  | Looking South-West from BH01 |
|  | BH01 Soil Profile |

| | |
|---|---|
|  | Existing dam on site |
|  | Existing dam on site |

| | |
|---|---|
|  | General site photos |
|  | Groundcover |

| | |
|---|---|
|  | General site photos |
|  | General site photos |