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GEOTECHNICAL REPORT: Proposed Residential Development

20 Sisley Street

St Lucia

ANE Properties Pty Ltd

February 2026

PG-14417

Revision 2

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5th February, 2026

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ATTN: JUNG EDWIN HAN

Dear Sir,

**GEOTECHNICAL INVESTIGATION – PROPOSED RESIDENTIAL DEVELOPMENT
20 SISLEY STREET, ST LUCIA**

Enclosed is a copy of our report for the above project dated February 2026. An electronic copy of the report has been issued.

Should you have any queries regarding this report, please do not hesitate to contact Chris Kosiek or James Daly at this office.

Yours faithfully,

C. KOSIEK (RPEQ 24394)

For and on behalf of
PACIFIC GEOTECH PTY LTD



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1.0 INTRODUCTION

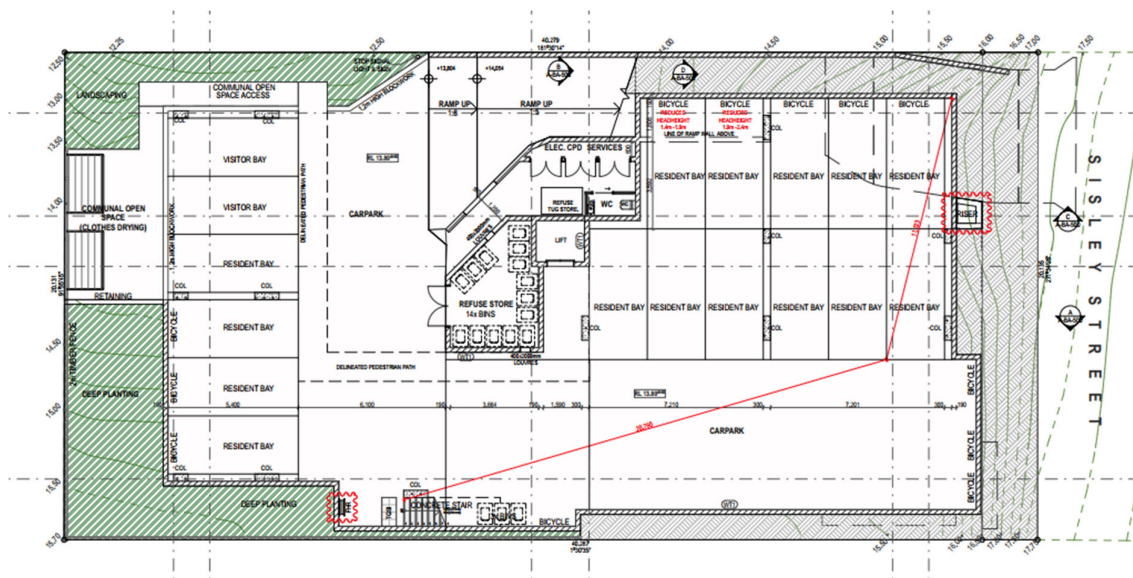
This report contains the results of the geotechnical investigation and provides advice and recommendations relating to the following:

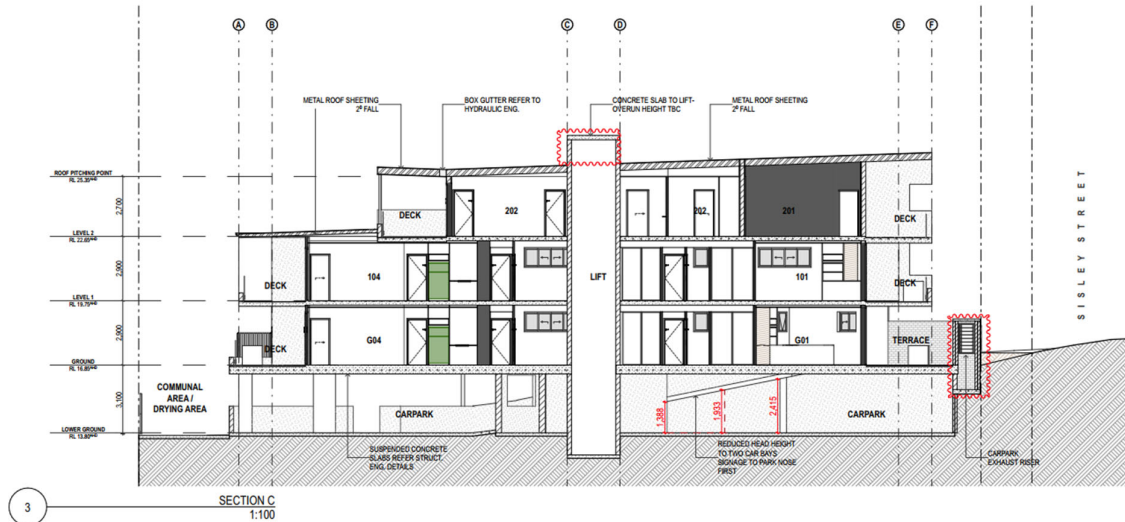
- Subsurface conditions in accordance with AS 1726
- Foundation recommendations
- Characteristic ground surface movements
- Earthworks considerations
- Batter slope recommendations
- Retention considerations
- Retaining wall design parameters
- Earthquake sub-soil classification
- Indicative pavement design parameters
- Construction considerations

Proposed Development

It is understood that the proposed development is to comprise the construction of a multi residential development at the site.

Proposed Development





2.0 METHODOLOGY

The geotechnical investigation comprised the drilling and sampling of six (6) boreholes to depths of between 0.5m (drilling rig refusal) to 6.0m, using a ute mounted drilling rig fitted with 100mm solid flight augers and hand augering equipment where drilling access was not available. Dynamic Cone Penetrometer (DCP) testing was conducted adjacent to the boreholes.

The soil classification descriptions and field tests were carried out in general accordance with Australian Standards.

AS 1726 Geotechnical Site Investigations

AS 1289 Methods of Testing Soils for Engineering Purposes

Borehole records, Dynamic Cone Penetrometer test results and a site plan showing the test locations are appended to the report.

3.0 SITE DESCRIPTION

The site of the proposed development is located at 20 Sisley Street, St Lucia.

At the time of the investigation, the site was occupied by an existing two storey brick building.

Vegetation comprised several small areas of grass and gardens.

The site was positioned within a gully, generally falling to the north and east. It appears that cut to fill earthworks have been carried out on the site to create the building platform.

Refer following aerial and site photographs for typical site conditions.

AERIAL IMAGE



SITE PHOTOGRAPHS



4.0 GEOTECHNICAL MODEL

The subsurface profile encountered in the boreholes consisted typically comprised fill over natural clays underlain by weathered rock. In boreholes BH01 and BH05 a layer of natural silty sand was encountered below the fill.

The fill material encountered at the site was relatively deep in several locations and appeared to be poorly compacted with a significant portion of deleterious material including rubbish, steel plastic, rubber etc. In the absence of documentation to confirm the placement and compaction conditions, the fill material is necessarily considered to be uncontrolled fill in accordance with AS 3798.

Table 1 presents a summary of the encountered subsurface profile. Detailed borehole record sheets are appended to this report.

TABLE 1 SUBSURFACE PROFILE SUMMARY

BH No.	Fill	Natural Ground			BH TD
		Silty SAND	Gravelly/Sandy/Silty CLAY	Weathered PHYLLITE	
BH01	0.0 – 0.2	0.2 – 0.4	0.4 – TD	NE	0.50 ⁴
BH02	0.0 – 1.2	NE	1.2 – 1.5	1.5 – TD	2.20 ³
BH03	0.0 – 4.2	NE	NE	4.2 – TD	6.00
BH04	0.0 – 3.9	NE	3.9 – 4.6	4.6 – TD	6.00
BH05	0.0 – 1.6	1.6 – 1.8	1.8 – 2.4	2.4 – TD	4.20 ³
BH06	0.0 – TD	NE	NE	NE	0.60 ⁴

Notes:

1. All depths in metres below ground level at time of investigation.
2. NE - Not Encountered; TD - Termination Depth.
3. Maximum TC bit; drill rig refusal.
4. Hand auger refusal.

Groundwater or subsurface seepage was not encountered in the boreholes at the time of drilling. Seepage could be expected through the surficial soils and along the soil/rock interface following periods of rainfall.

5.0 SITE CLASSIFICATION

The investigation and laboratory test results indicate that the development site would be classified Class P in accordance with AS 2870-2011 'Residential Slabs and Footings' due to the depth of fill.

From a reactivity perspective, ground surface movements of up to 35mm (Class M) have been assessed. This does not include potential settlement of the existing fill.

It is recommended that the readers satisfy themselves that the use of AS 2870-2011 is applicable for the proposed design and the above site classification re-confirmed following the completion of the bulk earthworks operation.

6.0 BUILDING FOUNDATIONS

The appropriate footing system will depend on the proposed earthworks. The depth of the existing fill may preclude the use of high-level footings and a deep foundation system comprising bored piers could be considered in these areas.

6.1 High Level Foundations

An allowable bearing capacity of 200kPa in the natural very stiff clays and 450kPa in the extremely to highly weathered rock would be available, subject to inspection at the time of excavation.

Where uncontrolled fill is encountered, footings should be deepened to penetrate the uncontrolled fill material.

It is recommended that footing inspections be undertaken by Pacific Geotech, following excavation, to confirm the specified founding strata has been reached.

It is recommended that masonry walls supported on high level footings founding in the fill or natural clay be suitably articulated.

Where footings are located adjacent to excavations such as underground service trenches, it is recommended that the footings be deepened to found at least 200mm below a line drawn up at 45 degrees from the base of the trench.

6.2 Deep Foundations

Bored piers or possibly timber push or screw piles could be considered for the support of the proposed structure.

The deep foundation system should be designed in accordance with the recommendations of AS 2159-2009 'Piling - Design and Installation'.

The ultimate geotechnical strength ($R_{d,ug}$) of piles can be calculated using the unfactored, ultimate shaft adhesion and end bearing values given in Table 2. The $R_{d,ug}$ values given in Table 2 will need to be multiplied by a suitable geotechnical strength reduction factor (ϕ_g) to obtain the design geotechnical strength ($R_{d,g}$) of piles. In accordance with AS2159-2009, the ϕ_g value must be determined by the designer, but based on the anticipated site, design and installation risk factors, a ϕ_g value of 0.45 is suggested. Higher values may be applicable with suitable supervision.

If working stress methods are used in the pile design, the $R_{d,ug}$ values given in Table 2 will need to be divided by a factor of safety of 2.5 to calculate the maximum single pile working load.

TABLE 2 ULTIMATE (UNFACTORED) PILE DESIGN PARAMETERS

Material	Ultimate Unfactored End Bearing* (kPa)		Ultimate Unfactored Shaft Adhesion* (kPa)
	L < 4D	L > 4D	
Existing Fill	NR	NR	0
Natural very stiff clay	600	900	30
XW-HW Rock	1500	2250	60
Notes: *Geotechnical strength reduction factor needs to be applied to these parameters. 1. NR – Not Recommended. 2. L – total pile length; D – pile diameter.			

Construction Considerations

The bases and sides of bored pile holes must be thoroughly cleaned of all loose soil and rock debris using a proper cleaning tool. The practice of adding water and spinning the auger is generally not acceptable.

Drilling piles is not only dependent on the subsurface profile characteristics, but also the type (power and size) of the bored pile drilling rig, drilling teeth, size of pile, etc. It is recommended that a specialist drilling contractor be consulted to be able to manage the above conditions and materials encountered. The presence of foreign inclusions in the fill may also present challenges to any proposed deep foundation.

During construction, all bored piles must be inspected by a geotechnical engineer to confirm the geotechnical strength parameters presented in Table 2 and to check the capacity of the piles.

7.0 EARTHWORKS AND SITE PREPARATION CONSIDERATIONS

Earthworks are expected to comprise of cuts of up to 3m for the undercroft.

It is recommended that the following site preparation and earthworks procedures be carried out as part of the earthworks procedures during development.

- All earthworks operations should be carried out in general accordance with AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments".
- Trafficability across the site at the time of the investigation was assessed poor due to the sloping ground.
- If significant rainfall events occur during the earthworks operation, some difficulties could be experienced in trafficking the exposed surface.
- All topsoil (i.e. soil containing organic matter) and soils containing deleterious matter should be stripped from the construction area at the commencement of the earthworks operation.
- The stripped surface should be proof rolled using a large vibrating roller, to identify areas of weak surficial soils and to compact the upper-level material.

- The majority of the soils on site will be suitable for re-use as structural fill, provided material is free of organic matter and deleterious material. It is likely that the soils require conditioning to bring the soils to optimum. If the clays were overly moist, difficulty in achieving compaction of the materials will be encountered and moisture conditioning will be required.
- Imported fill should be of fair to good quality with a minimum Soaked CBR value of 10%, a maximum $I_{ss}=1.0\%$ and a maximum particle size of 75mm.
- All filling should be undertaken in layer thicknesses of approximately 250mm (or as appropriate for the compaction equipment being used). Fill should be compacted to a minimum dry density ratio of 98% Standard in accordance with AS1289 5.1.1.
- Field density testing should be carried out to check the standard of compaction achieved and the placement moisture content. The frequency and extent of testing should be as per guidelines in AS.3798-2007.
- All earthworks operations should be performed under Level 1 supervision, in general accordance with the requirements of AS3798 and should be certified as controlled fill by the testing authority.

8.0 EXCAVATION CHARACTERISTICS

Cuts of up to 3m are required for the proposed development. Weathered rock was encountered at depths of between 1.5m and 4.6m across the proposed development location and drilling rig refusal was met in these boreholes at depths of between 2.2m and 4.2m. Difficulty in achieving excavation for conventional equipment beyond the depths of borehole refusal is typically met.

The depth of drilling rig refusal across the site is tabulated below.

TABLE 3 SUMMARY OF DRILL BIT LIMITS

Borehole No.	Limit of 'TC' Bit (m)
BH02	2.2
BH05	4.2

The limit of the drilling rig is typical of the practical limit of excavations for a medium sized dozer (say Cat D6) in bulk excavation or a 20 to 25 tonne excavator using general purpose toothed buckets.

As excavations beyond the level of drilling rig refusal is required, it is expected that either large excavators, and/or hydraulic rock breakers will be required for the excavation.

Consideration of the presence of high level rock across the site should be made in the earthworks contract. The presence of foreign inclusions in the fill may also impede excavations in the wall.

9.0 BATTERS

It is understood that cut batters to 3m in height may be required as part of the proposed development. It is expected that the profile in the batter excavations will consist natural clays and weathered rock at the front of the site and a significant depth of fill overlying the natural profile in the middle and rear of the site.

Maximum safe cut batter angles for unsurcharged batters less than 3.0m high, above the water table site are shown below in Table 4 below.

Where surcharges are located within H(m) (height of the batter) of the top of the batter, then some reduction in the design angle will be required.

TABLE 4 SAFE BATTER ANGLES

Material	Short Term	Long Term
Uncontrolled Fill Soils	34° (1V:1.5H)	NR
Natural Clay/Sand Soils	45° (1V:1H)	26° (1V:2H)
XW – HW Rock	45° - 60°	30° (1V: 1.75H)

Note: Batter angles are subject to inspection by experienced geotechnical engineer/engineering geologist.

Structural fill batters should be overconstructed and trimmed back at no steeper than 2(H):1(V) or 26°.

It is essential that batters be suitably protected from erosion and scour. Runoff should not be allowed to discharge directly across the batters.

For excavations of a very short-term nature, and subject to assessment of factors such as the conditions at the time of excavation, length of time excavations are to remain open, working conditions/requirements and most importantly the rock structure in the cut face, etc., steeper excavations could be possible. Pacific Geotech should be contacted to determine an appropriate profile when construction details have been finalised.

10.0 RETENTION CONSIDERATIONS

Where space does not permit the construction of batters as described in Section 9.0 above, excavations will likely require support from temporary support systems.

The following options are generally considered for basement retention (refer Figure 1).

- 1) Batter to safe angle – may not be possible due to geometric considerations
- 2) Sheet piles - not possible due to high rock level.
- 3) Soldier Pile Wall – Appropriately designed cantilevered soldier pile wall may be the most appropriate retention system. In-fill panels may be required to support the soil between the piles, depending on soil parameters, seepage inflows and length of time the excavation will be open for.

- 4) Post and Panel Wall – A post and panel wall system, possibly comprising of bored piles with suitably sized UB installed into the per holes, with either sleepers or precast or panels slotted into the UB's could be considered.
- 5) Contiguous Piers - probably not required unless movement sensitive structures or services are located in footpath.
- 6) Reinforced Shotcrete and Rock Anchors – A temporary shotcrete and passive rock anchor system could be constructed to support the cut faces in the rock until the permanent retaining wall is constructed. May not be suitable to retain the fill material. Approvals and permission from neighbouring landowners will be required if anchors extend beyond the property boundary.

Together with the method of basement retention the method of propping also needs to be determined these include.

- A. Cantilever
- B. Socket and Anchor
- C. Internal Bracing

The method of temporary and permanent support should be considered. If a permanent system is required, then the use of thicker wall sections and increased corrosion protection must be considered.

10.1 Monitoring

It is strongly recommended that several monitoring stations be set up on the walls to check for movement during excavation. A suggested number of locations would be every 5m to 10m along the tops of the walls with additional locations along the base of the walls. A regular monitoring program of these stations should be implemented.

The following comments can be made with respect to support requirements: -

- Where anchoring is used permission will need to be given by adjoining landowners to allow access under their property.
- A detailed survey (including depths) of services along all boundaries will need to be made to assess the effect these services will have on any anchoring system.

10.2 Wall Drainage

In order to control the groundwater level behind the walls, it will be necessary to install drainage behind shotcrete facing, typically comprising full height strips of 'Core Drain' (or equivalent) of 20mm minimum thickness, spaced horizontally at not more than approximately 1.8m centres.

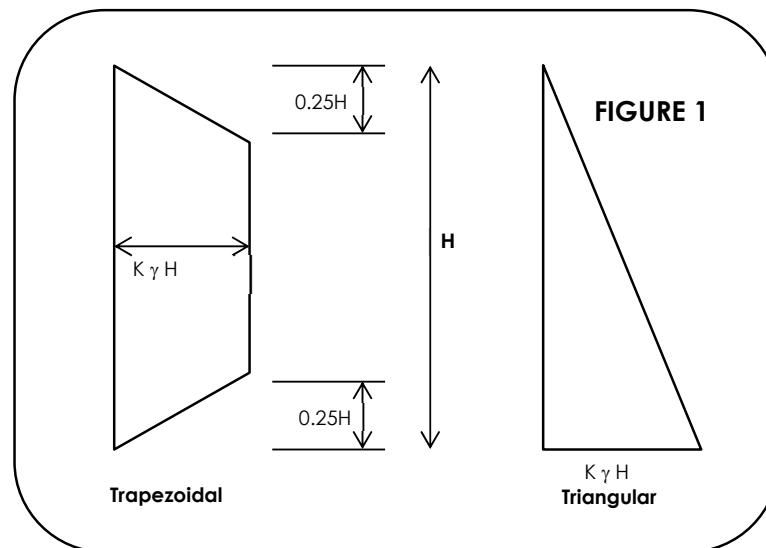
10.3 Construction Inspection

It is recommended that regular inspections be carried out during the excavation by a duly qualified Geotechnical Engineer.

11.0 RETAINING WALLS

Retaining walls should be specifically engineer designed in accordance with AS 4678-2002 (Ref 9).

The design of flexible retaining walls could be undertaken using a triangular pressure distribution and the earth pressure parameters given in Table 5. Flexible walls are those which are free to rotate or tilt (such as cantilevered walls) and should be designed using active (K_a) earth pressure coefficient. Rigid walls are those which are restrained against rotation or tilt (i.e. single anchored/propped walls) and should be designed using the at-rest earth pressure (K_o) and a trapezoidal pressure distribution as per Figure 1.



Passive resistance (K_p) at the toe of the wall should be ignored in the zone where future disturbance (e.g. services trenches) could occur.

The effects of surcharge in the retained zone should be included by multiplying the vertical pressure developed by the surcharge by the appropriate lateral earth pressure coefficient. Allowance should also be made for the surcharge due to sloping crests if applicable.

TABLE 5 EARTH PRESSURE COEFFICIENTS (NON-SLOPING CREST BACKFILL)

Material	Unit Weight (kN/m ³)	Friction Angle (degrees)	Active Ka	At Rest Ko	Passive Kp
Controlled Fill*	19	24	0.45	0.60	2.40
Natural Clay	19	26	0.39	0.56	2.56
Phyllite – XW-HW	20	35	0.27	0.43	3.69

Notes: * Depends on fill material type and level of compaction. Assumes material compacted under 'Level 1' supervision.

Preference should be given to adopting thin soil layers and using small hand-controlled compaction equipment during backfilling against retaining walls. This is in order to limit the stress applied to the walls during construction. Should heavy compaction be required, then wall stresses will be well in excess of Ko and temporary propping should be used.

Clay backfill should not be placed dry of optimum moisture content, as this can lead to increased future swelling with changes to moisture content or inundation from water creating additional load on the back of the wall.

It is recommended that all retaining walls be drained for full height in order to minimise hydrostatic pressure build-up behind the wall. Additional guidelines on wall drainage are provided in Appendix G of AS 4678-2002.

12.0 SITE MANAGEMENT

To maintain the long term performance of the structure, good management of the soil conditions and the development is vital throughout the life of the development.

The following are some specific comments with respect to site management.

- The ground surface around the perimeter of the buildings should slope away from the structure and fall to the stormwater system. Water should not be allowed to pond adjacent to the buildings.
- Founding soils should not be allowed to become saturated.
- Service trenches under the buildings should be kept to a minimum. Saturation of the on-site material will result in an increase in potential ground surface movements.
- Footings should be poured immediately after excavation. If footings cannot be poured on the same day as excavation, a blinding layer of 50mm thickness is recommended.
- Trees, garden beds and other vegetation should be planted at a distance at least equivalent to three quarters of their mature height away from the structures. This will assist in minimising shrinkage movements in the expansive on-soils.

13.0 LIMITATIONS

We have prepared this report for the Proposed Residential Development at 20 Sisley Street, St Lucia . The report is provided for the exclusive use of ANE Properties Pty Ltd, for this project only and for the purposes outlined in the report. It should not be used by, or relied upon, for other projects on the same or different sites or by a third party. In preparing this report, we have relied upon information provided by the client or their agents.

The results are indicative of the subsurface conditions on site only at the specific testing locations. Subsurface conditions can change between test locations and the design and construction should take the spacing of the testing and testing methods adopted and the potential for variation between the test locations.

It is recommended that Pacific Geotech be engaged to provide advice and ensure the development is undertaken in accordance with the assumptions made in writing this report.

This is not to reduce the level of responsibility accepted by Pacific Geotech, but rather to ensure that the parties who may rely on the information contained in this report are aware of the responsibilities they assume in doing so.

Yours faithfully,

C. KOSIEK (RPEQ 24394)

For and on behalf of
PACIFIC GEOTECH PTY LTD

APPENDICES

APPENDIX A
NOTES RELATING TO THIS REPORT

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis.

Every care has been taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical conditions and contains recommendations or suggestions for design and construction. However, unexpected variations in ground conditions will occur. The potential for this will depend partly on testing, spacing and sampling frequency.

If variations are identified, Pacific Geotech would be pleased to assist with additional investigations or advice to resolve the matter.

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Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Description and Classification Methods

The description and classification of soils and rocks used in this report are based on AS 1726.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the percent of

other particles present (e.g. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	less than 0.002mm
Silty	0.002 to 0.06mm
Sand	0.06 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density which can be correlated from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very Loose	less than 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) and can be quantified by the Pocket Penetrometer test, Vane Shear test, laboratory testing or engineering examination. The strength terms are defined as follows:

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 - 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 - 400
Hard	greater than 400
Friable	strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc.

Planarity	
CU	Curved
DIS	Discontinuous
IR	Irregular
PR	Planar
ST	Stepped
UN	Undulose

Roughness	
POL	Polished
RJ	Rough
S	Smooth
SL	Slickened
VR	Very Rough

Defects	Type
BP	Bedding Parting
CL	Cleavage
CO	Contact
CS	Crushed Seam
CZ	Crushed Zone
DB	Drilling Break
DK	Dyke
DL	Drill Lift
DZ	Decomposed Zone
FC	Fracture
FL	Foliation
FZ	Fracture Zone
HB	Handling Break
IS	Infilled Seam
JT	Joint
H	Schistosity
SI	Sill
SM	Seam
SS	Shear Seam
SZ	Shear Zone
VN	Vein
VO	Void

Sampling

Sampling is undertaken during the fieldwork to allow examination of the soil or rock and to allow laboratory testing to be undertaken.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content and minor constituents. Bulk samples are similar but of greater volume required for some test procedures such as CBR testing.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and collecting a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

Investigation Methods

Test Pits: These are typically undertaken with a backhoe or a tracked excavator, allowing examination of the insitu soils. Limitations of test pits are the problems associated with collapse of the pits, disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of typical diameter of between 50mm to 75mm advance manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as fill, gravel, hard clays and collapse of the borehole (typically in non-cohesive soil).

Continuous Spiral flight Augers: The borehole is advanced using 65mm to 100mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. Augers of up to 300mm in diameter are used to recover larger volumes of sample. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights. Samples can be disturbed and layers may become mixed. Augering below the groundwater table can be less reliable than augering above the water table.

A Tungsten Carbide (TC) bit for auger drilling into rock can be used to indicate rock strength and continuity by variation in drilling resistance and from examination of recovered rock fragments but provides only an indication of the likely rock strength. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is advanced by a bit attached to the end of a hollow rod string, with water being pumped down the drill rods and returned up the annulus of the borehole, carrying the drill cuttings. Changes in stratification can be determined from the return, together with information from "feel" and rate of penetration.



The borehole can be stabilised through the use of drilling mud as a circulating fluid. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. This technique provides a reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel is used, which gives a core of about 50mm diameter. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a disturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposed", Test 6.3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer, with a free fall of 760mm. The sample is driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense soils, hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of , say, 4, 6 and 7 blows, as
N = 13
4, 6, 7
- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as
N > 30
15, 30/40mm

Cone Penetrometer Testing (CPT): Cone Penetrometer Testing with or without pore pressure measurement (CPTu) is carried out

using a Cone Penetrometer in general accordance with AS 1289 6.5.1, 1999.

In the tests, a 36mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the fractional resistance on a separate 135mm long sleeve, immediately behind the cone. Pore Pressure is recovered through a pore ring located either within, or more usually immediately behind the cone/tip.

As penetration occurs (at a rate of approximately 20mm per second) and data is recorded every 20mm of penetration, the results are presented graphically.

The information provided on the plot comprises:

- Cone resistance – expressed in mPa
- Sleeve friction – expressed in kPa
- Friction ratio – the ratio of sleeve friction to cone resistance expressed as a percentage.
- Pore pressure in kPa
- Tilt of probe (in degrees).

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and rising to 2% to as high as 8%, and higher in organic soils. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes, etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive.

Dynamic Cone Penetrometers:

Dynamic Cone Penetrometer (DCP) tests are carried out by driving a 16mm diameter rod into the ground with a 9kg sliding hammer dropping 510mm and counting the blows for successive 100mm increments of penetration.



Logs

The borehole or test pit logs are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of the boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

Groundwater

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be flushed from the hole and drilling mud must be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes from which ongoing monitoring can be undertaken.

Fill

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, steel, etc.) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used

for fill, it may be difficult to reliably determine the extent of the fill.

Laboratory Testing

Laboratory testing is carried out in general accordance with Australian Standard 1289 'Methods of Testing Soil for Engineering Purposes'.

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage.

Review of Design

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/constraints are quite complex, it is prudent to have a design review.

Site Inspection

Pacific Geotech would be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related:

Requirements could range from:

- i. a site visit to confirm that conditions exposed are no worse than those interpreted, to
- ii. a visit to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, or
- iii. full time engineering present on site.

APPENDIX B

BOREHOLE RECORD SHEETS

Client: ANE Properties
 Project Name: Proposed Residential Development
 Hole Location: 20 Sisley St, St Lucia QLD 4067, Australia
 Hole Position: 499819.5 m E 6958736.1 m N 56J

Commenced: 04/12/2025
 Logged By: Mathew Waite
 Checked By:

Drill Model and Mounting: Hand Auger
 Hole Diameter: 75 mm

RL Surface: 15.9
 Datum: AHD Operator:

Drilling Information					Soil Description		DCP	Well Diagram			
Method	Casing	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)			Graphic Log	Classification Symbol	Material Description
Hand Auger						0.2		SM	FILL Gravelly Silty SAND (SM) Dense, fine to coarse grained, orange pale orange brown, fine to medium sized gravel, low plasticity fines, moist.	0 5 10 15 20 25	
						0.4		SM	NATURAL Gravelly Silty SAND (SM) Medium dense to dense, fine to coarse grained, brown, fine to medium sized gravel, low plasticity fines, (with trace of clay)		
								CI	NATURAL Sandy CLAY (CI) Stiff to very stiff, medium plasticity, brown, grey, fine to medium grained sand, with fine to medium sized gravel, moist.		
									BH01 Refusal at 0.5 m (Hand Auger Refusal)		

Method	Water	Samples and Tests	Remarks
AS - Auger RR - Rock Roller W - Washbore Support C - Casing	Level (Date) Inflow	U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test B - Bulk Sample Classification Symbols and Soil Descriptions Based on Unified Soil Classification System	

Client: ANE Properties
 Project Name: Proposed Residential Development
 Hole Location: 20 Sisley St, St Lucia QLD 4067, Australia
 Hole Position: 499834.3 m E 6958734.0 m N 56J

Commenced: 04/12/2025
 Logged By: Mathew Waite
 Checked By:

Drill Model and Mounting:
 Hole Diameter: 100 mm

RL Surface: 16.75
 Datum: AHD Operator:

Drilling Information					Soil Description			DCP	Well Diagram		
Method	Casing	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log Classification Symbol			Material Description	
Auger			D 0.05 - 1.2 m		16.75	0.05	PAV	Topsoil/Grass - 50mm	0		
							GC	FILL Clayey Sandy GRAVEL (GC) Medium dense, fine to coarse sized, dark brown, fine to coarse grained sand, medium plasticity clay, moist. (With rubbish, glass, metal, and ceramics)	2	2	
						1.0			6	5	
						1.2			4	3	
			D 1.5 - 2.2 m		15.0	1.5	CI	NATURAL Sandy Silty CLAY (CI) Very stiff, medium plasticity, pale brown, fine to coarse grained sand, trace of fine sized gravel, moist.	3	3	
						1.5			4	3	
					15.0	1.5	PH Y	ROCK PHYLLITE (XW) Extremely weathered, extremely low strength, pale orange brown, dry to moist.	5	5	
					20.0	2.0			13	16	
									20		
			BH02 Refusal at 2.2 m (MAX TC Bit)								

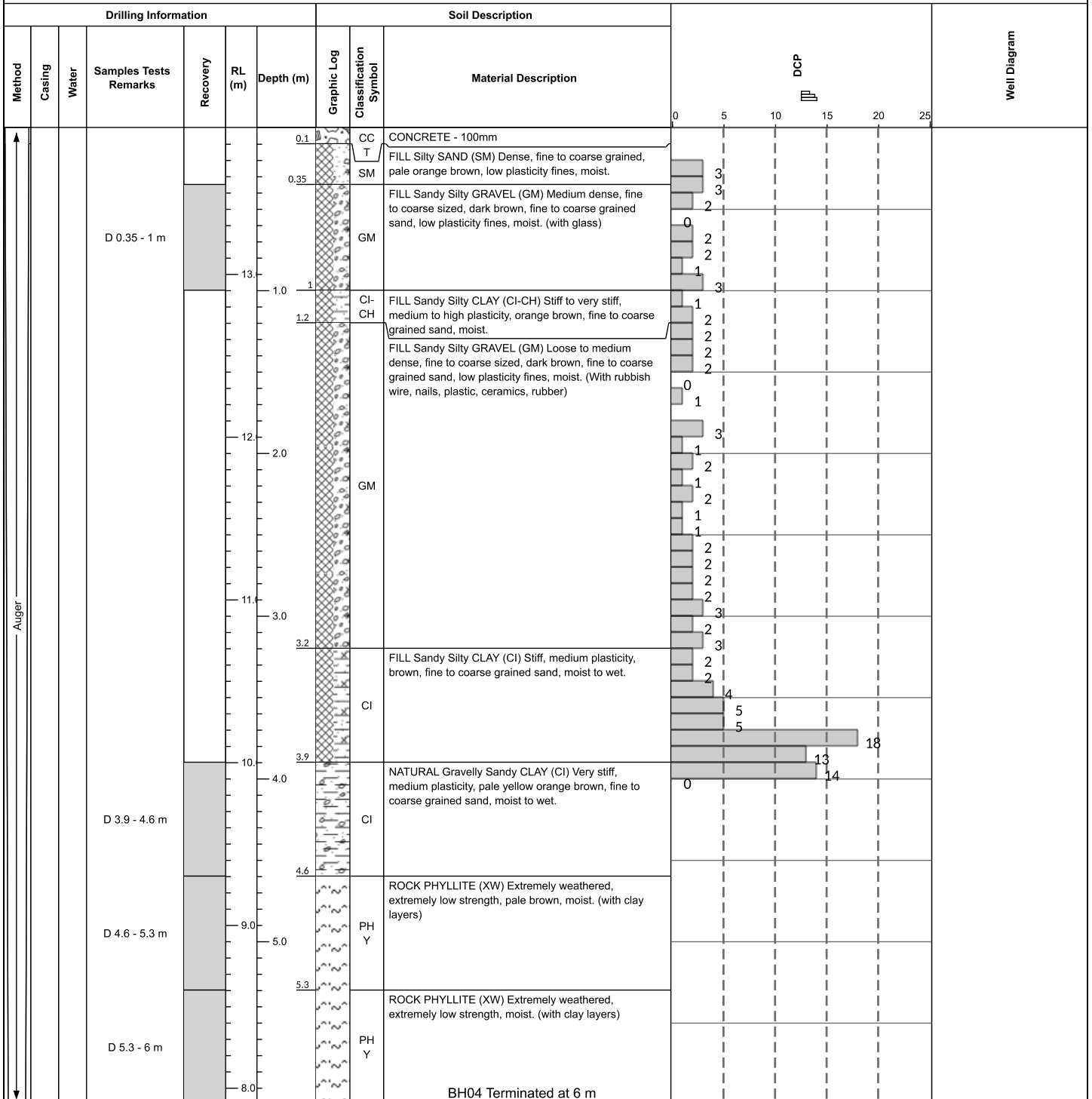
Method AS - Auger RR - Rock Roller W - Washbore	Water Level (Date) Inflow	Samples and Tests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test B - Bulk Sample	Remarks
Support C - Casing	Classification Symbols and Soil Descriptions Based on Unified Soil Classification System		

Client: ANE Properties
 Project Name: Proposed Residential Development
 Hole Location: 20 Sisley St, St Lucia QLD 4067, Australia
 Hole Position: 499837.2 m E 6958754.6 m N 56J

Commenced: 04/12/2025
 Logged By: Mathew Waite
 Checked By:

Drill Model and Mounting:
 Hole Diameter: 100 mm

RL Surface: 13.9
 Datum: AHD Operator:



Method AS - Auger RR - Rock Roller W - Washbore	Water Level (Date) Inflow	Samples and Tests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test B - Bulk Sample	Remarks
Support C - Casing	Classification Symbols and Soil Descriptions Based on Unified Soil Classification System		

Client: ANE Properties
 Project Name: Proposed Residential Development
 Hole Location: 20 Sisley St, St Lucia QLD 4067, Australia
 Hole Position: 499828.2 m E 6958770.1 m N 56J

Commenced: 04/12/2025
 Logged By: Mathew Waite
 Checked By:

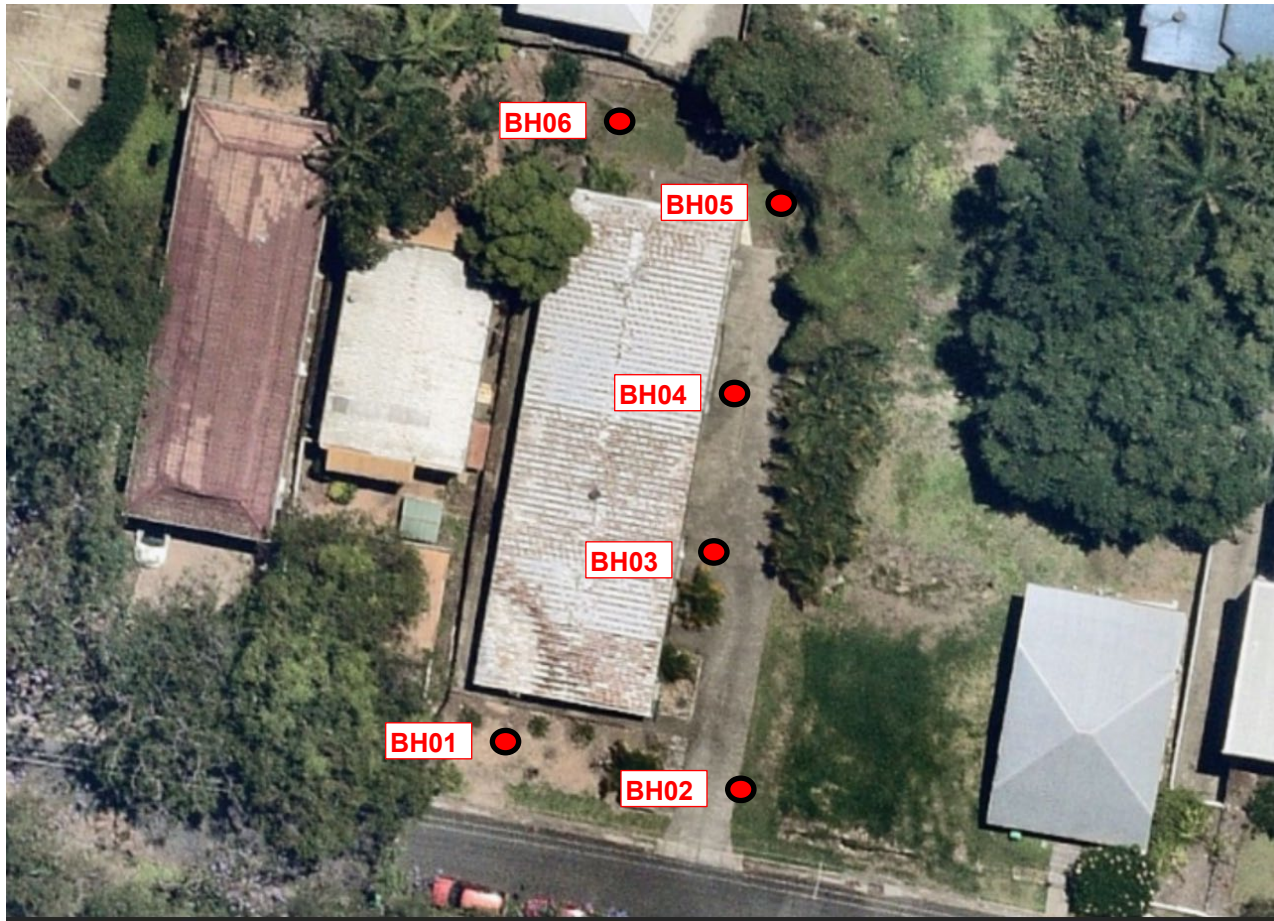
Drill Model and Mounting: Hand Auger
 Hole Diameter: 75 mm

RL Surface: 14.75
 Datum: AHD Operator:

Drilling Information					Soil Description			DCP	Well Diagram		
Method	Casing	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log Classification Symbol			Material Description	
Hand Auger						0.05	PAV	Topsoil/Grass - 50mm	2		
						0.4	GC	FILL Clayey Sandy GRAVEL (GC) Medium dense, fine to coarse sized, dark brown, coarse grained sand, low to medium plasticity clay, moist.	3		
							GC	As above, but: (with glass and ceramics)	2		
							GC		1		
								BH06 Refusal at 0.6 m (Hand Auger Refusal)	2		
									3		
									3		
									3		
									4		
									5		
									4		
									6		
									8		
									15		
									20		

Method AS - Auger RR - Rock Roller W - Washbore	Water Level (Date) Inflow	Samples and Tests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test B - Bulk Sample	Remarks
Support C - Casing	Classification Symbols and Soil Descriptions Based on Unified Soil Classification System		

APPENDIX C
SITE PLAN



Drawn CK	Project:	Proposed Multi-Residential Development	Drawing No. PG-14417	A4
Date 4.12.25	Location:	20 Sisley Street, St Lucia		
Checked	Client:	ANE Properties Pty Ltd		