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GEOTECHNICAL INVESTIGATION REPORT

Proposed Residential Development

381 Wuraga Rd, Bahrs Scrub QLD 4207

Prepared for

Arcoterra Pty Ltd

Project No

2854

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1. INTRODUCTION

At the request of Arcoterra Pty Ltd ('Arcoterra'), ASCT Brisbane South Pty Ltd ('ASCT') has conducted a geotechnical investigation for the proposed residential development works planned at 381 Wuraga Road, Bahrs Scrub QLD 4207 ('site')

Based on the supplied information, we understand that the proposed development includes the subdivision of thirty-eight (38) lots and construction of local roads and services.

The purpose of the proposed investigation, was to obtain geotechnical information on the existing site and subsurface conditions and include the following:

a) A description of the soil profile at the nominated borehole locations.
b) Presence of groundwater, if any encountered at the time of auguring.
c) Dynamic Cone Penetrometer testing adjacent to each borehole location.
d) Atterberg Limits and Particle Size Distribution of the subsurface material.
e) CBR & modulus of subgrade reaction for the design of pavements.
f) Subgrade preparation options & methodology.
g) Preliminary site classification in accordance with AS2870 "Residential Slabs and Footings".
h) Provide advice on bulk earthworks, batter slopes, building footings, sediment/erosion control and excavatability
i) Footing design parameters
j) Retaining Wall design parameters

The assessment comprised of conducted boreholes at six (6) locations, laboratory testing, assessment of laboratory test results and comments on the above items.

This report must be read in conjunction with the attached *"General Notes".*

2. SITE DESCRIPTION

The site is located at 381 Wuraga Road, Bahrs Scrub, along the south/western extents of Wuraga Road and comprises of densely vegetated bushland with residential properties towards the southern extents of the site. The site is fairly irregualar in shape, with significant gradient falling to the west. Drainage appeared to be fair.

Along the western extents of the proposed residential development is an existing residential development accessed through Niles Court.

Refer to the following Plate 1 for the typical site conditions encountered during the fieldwork.

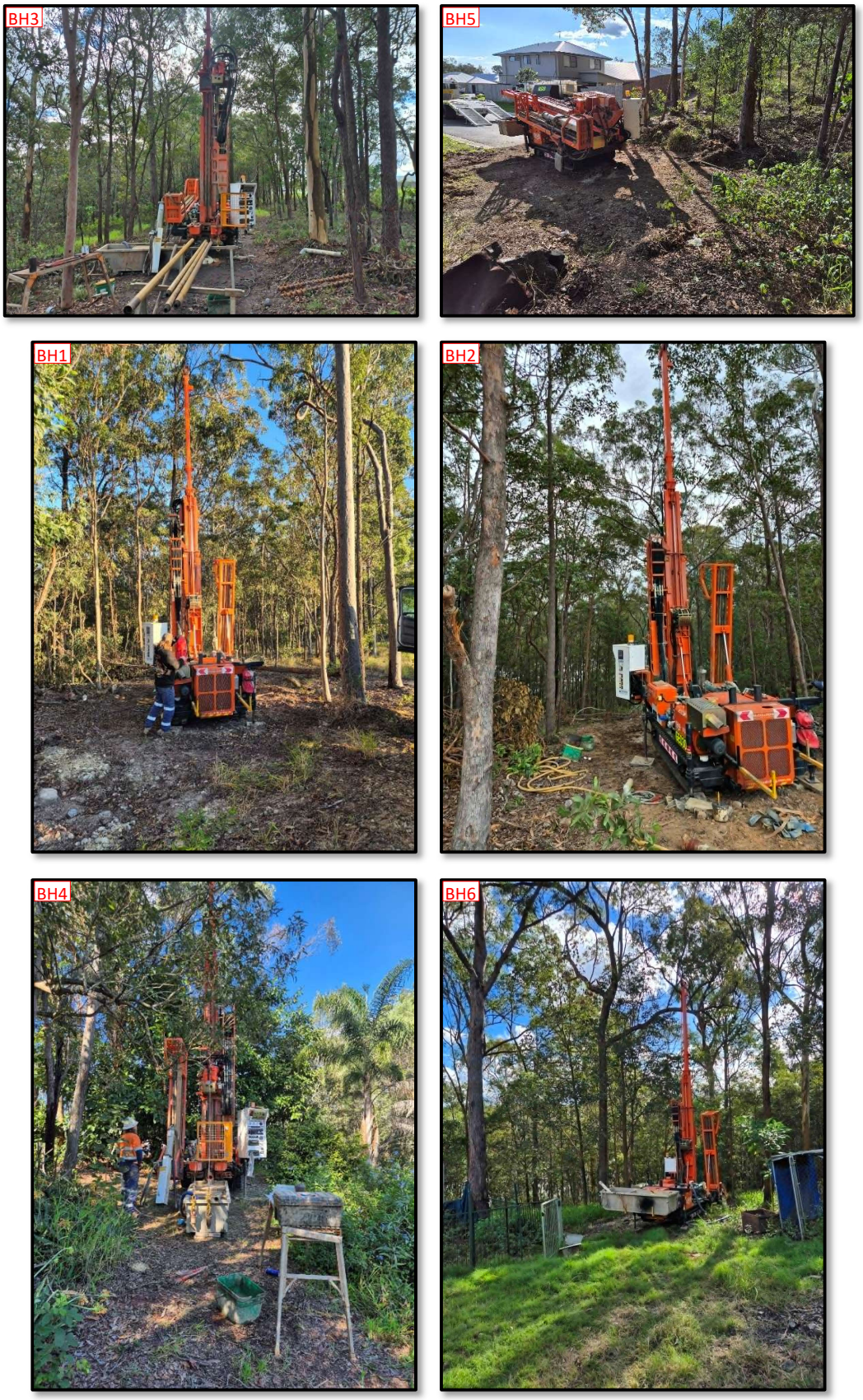


Plate 1: Typical site conditions within the site at the time of investigation.

3. INVESTIGATION WORK

3.1 Fieldwork

Fieldwork for the geotechnical investigation was carried out on 1st to 3rd of July 2026. As part of the investigation, a total of six (6) boreholes (designated as BH1 – BH6) were drilled using a Ute mounted drill rig equipped with 100mm nominal diameter solid flight auger with Tungsten Carbide (TC) bit attachment to the depths nominated by the client or to refusal.

California Bearing Ratio (CBR) material sampling was undertaken with a 300mm auger at select locations.

The approximate locations of boreholes and CBR locations are presented in attached Figure 1.

Standard Penetration Tests were undertaken from a depth of 1.0m and every consecutive 1.5m within the soil profile. SPT samples were collected for laboratory tests. NMLC rock coring was undertaken when encountering highly weathered rock material.

A bulk sample of the subgrade material in the predominant surface soil types were collected for California Bearing Ratio (CBR) testing at select locations. Two (2) samples were collected from underneath the proposed pavement areas for California Bearing Ratio (CBR) testing.

All the fieldwork was undertaken by experienced geotechnical personnel who logged the boreholes and collected the samples for visual and tactile assessment and further laboratory testing.

Groundwater water levels were noted, if encountered, during and shortly after completion of drilling at individual boreholes. Long-term groundwater monitoring was not carried out.

The material encountered at each investigation location is described on the borehole log sheets attached. Fieldwork was carried out in accordance with Australian Standard AS 1726 – 2017 '*Geotechnical Site Investigations*'.

Borehole coordinates were recorded using a handheld GPS device with accuracy consistency with such devices to approximately 5m and plotted in Figure 1.

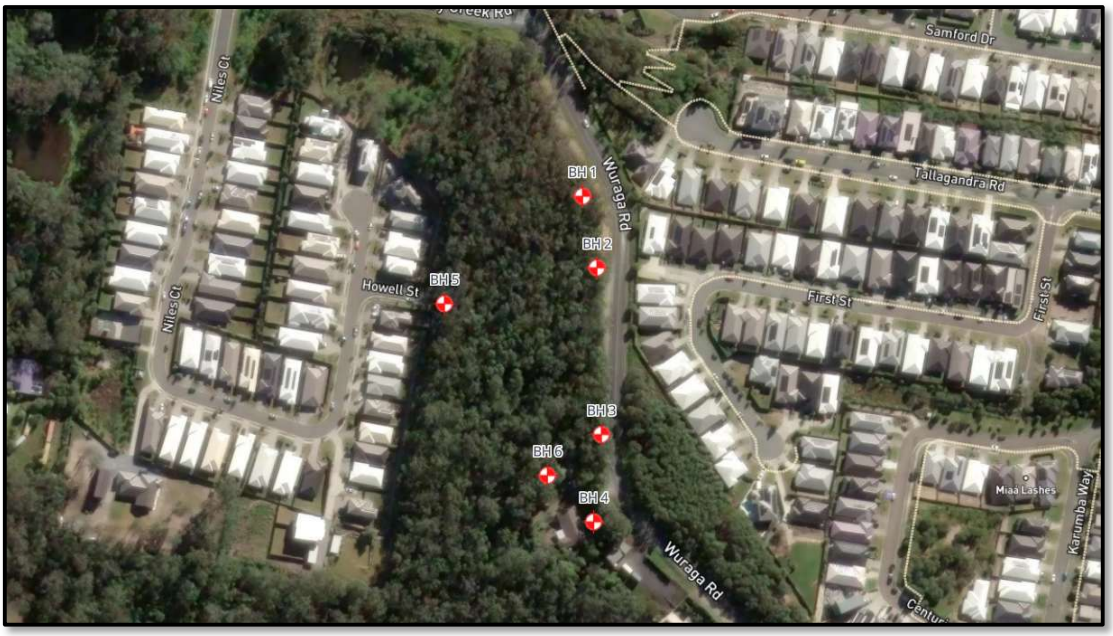


Figure 1: Borehole locations (generated on tablogs.com)

3.2 Laboratory Testing

Selected samples of representative strata were recovered from test locations and sent to our NATA accredited soils laboratory to determine the following.

i. Particle Size Distribution – (as per AS1289.3.6.1)
ii. Atterberg Limits
    a. Liquid Limit – (as per AS1289.3.1.2)
    b. Plastic Limit – (as per AS1289.3.2.1)
    c. Plasticity Index – (as per AS1289.3.3.1)
    d. Linear Shrinkage – (as per AS1289.3.4.1)
iii. Soaked CBR – (as per AS1289.6.1.1)
iv. Point Load Index – (as per AS4133.4.1)
v. Uniaxial Compressive Strength – (as per AS4133.4.2.2)
vi. Emerson Class Number – (as per AS1289.3.8.1)

The laboratory test results are included in the attachment.

4. SUBSURFACE CONDITIONS

4.1 Regional Geology

Based on the information from the University of Queensland's, *Queensland Geotechnical Database*, which utilises the 1:500k and 1:100k series of the Moreton Geological Map, the site is located within **Neranleigh-Fernvale beds (DCf)** typically comprising of low-grade metamorphic rocks such as mudstones, shale, chert and conglomerates. Originally sediments that towards the end of the carboniferous period, were compressed and uplifted into mountainous terrain.



Figure 2: Geology map (extracted from Queensland Geotechnical Database, University of Queensland ©)

4.2 Subsurface Conditions

The investigation work indicated that relatively consistent subsurface conditions existed at the investigated locations.

In general, the subsurface conditions encountered in the investigation mostly comprise of up to 2.3m thick of residual Clayey SANDS, medium dense to dense or stiff to very stiff CLAYs underlain by an Extremely Weathered (XW) interbedded metamorphic rocks trending towards Moderately Weathered (MW) with depth. The weathered rock typically comprised of interbedded. Phyllite, Chert and metasedimentary rocks.

The attached borehole logs should be referred to for the detailed description of the material encountered at each investigation location.

A summary is detailed in Table 1 below.

If the subsurface conditions substantially different from those encountered in the investigation are encountered during the proposed construction works, ASCT should be contacted for further assessment.

Table 1: Summary of Subsurface Strata in Boreholes

Soil / Rock Descriptions – Depth (m)									
BH No	NATURAL – COHESIONLESS			NATURAL – COHESIVE		WEATHERED ROCK			TD (m)
	Loose	Medium Dense	Dense	Stiff	Very Stiff to Hard	XW	HW	MW	
BH1	-	0.0–0.5	-	-	-	0.5-2.5	2.5–7.0	-	7.0
BH2	-	0.0–0.2	-	-	0.2-2.3	2.3-4.0	4.0–10.0	10.0–13.5	13.5
BH3	-	0.0–1.5	-	-	-	-	1.5–6.7	-	6.7[3]
BH4	-	0.0–2.0	-	-	-	-	2.0 – 8.5	-	8.5
BH5	0.0–0.2	-	-	0.2–1.6	-	-	1.6 – 4.0	-	4.0
BH6	-	0.0–1.0	1.6–4.3	-	1.0–1.6	-	-	-	4.3

Notes:

1. XW - Extremely Weathered; HW - Highly Weathered; MW - Moderately Weathered
2. BH1 and BH2 weathered rock comprises interbedded METASANDSTONE and PHYLLITE
3. BH3, BH4 and BH5: weathered rock comprises interbedded CHERT and SILTSTONE
4. BH3 terminated on TC bit refusal

4.3 Groundwater

No groundwater was encountered at the borehole locations at the time of the investigation. However, seepage could be expected in the soils along the soil / rock and sand / clay interfaces during and following periods of wet weather.

4.4 Laboratory Test Results

The following Tables 2 and 6 detail the samples tested, and results obtained.

Table 2: Particle Size Distribution and Atterberg Limits Test Results Summary

Sample Location	Sample Number	Sample Depth (m)	Liquid Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	% passing AS Sieve		
						2.36	0.425	0.075
BH2	165396	1.0	44	18	9.0	75	63	55
BH5	165335	0.6 - 0.8	40	20	10.0	90	76	63
BH5	165397	2.5	27	8	3.5	100	61	40
BH6	165398	1.0	47	22	11.0	71	59	49

Table 3: CBR Test Results Summary

Sample Location	Sample Number	Sample Depth (m)	Moisture -Density Relationship (Standard)		Soaked CBR value (%)	CBR Swell (%)
			Maximum Dry Density (t/m^3)	Optimum Moisture Content (%)		
BH5	165335	0.6 - 0.8	1.61	21.5	3.0	2.5
BH6	165334	0.7 - 1.0	1.57	23.0	8	1.0

Table 4: Summary of Point Load Index Test Results

Sample Location	Sample Number	Sample Depth (m)	Test Type	Uncorrected Point Load Strength, I_s (MPa)	Estimated Point Load Strength, $I_{s(50)}$ (MPa)	Uniaxial Compressive Strength (AS1726 Table 19) (MPa)
BH1	52373	3.18 - 3.28	Diametral	**0.29**	**0.29**	**2 - 6**
			Axial	**0.13**	**0.12**	**2 - 6**
BH1	52374	4.16 - 4.25	Diametral	0.16	**0.16**	**2 – 6**
			Axial	0.43	**0.42**	**6 - 20**
BH1	52375	5.76 - 5.86	Diametral	0.20	**0.19**	**2 - 6**
			Axial	0.53	**0.51**	**6 - 20**
BH1	52376	6.62 - 6.70	Diametral	0.49	**0.48**	**6 - 20**
			Axial	0.61	**0.57**	**6 - 20**
BH2	52377	6.36 - 6.44	Diametral	0.32	**0.32**	**6 - 20**
			Axial	0.88	**0.83**	**6 - 20**
BH2	52378	7.88 - 7.96	Diametral	0.23	**0.22**	**2 - 6**
			Axial	0.67	**0.70**	**6 - 20**
BH2	52379	9.42 - 9.81	Diametral	0.82	**0.79**	**6 - 20**
			Axial	0.17	**0.18**	**2 - 6**
BH2	52380	11.25 - 11.34	Diametral	0.17	**0.16**	**2 – 6**
			Axial	0.30	**0.31**	**6 - 20**
BH3	52381	6.13 - 6.20	Diametral	4.7	**4.5**	**60 - 200**
			Axial	5.7	**5.8**	**60 - 200**

Table 5: Summary of Uniaxial Compressive Strength Test Results

Sample Location	Sample Number	Sample Depth (m)	Failure Mode	Uniaxial Compressive Strength (MPa)	Strength Term
BH5	165335	**0.6 – 0.8m**	Single Shear	**4.6**	**Low**

Table 6: Emerson Class Number Test Results Summary

BH number	Lab sample number	Sample depth (m)	Emerson Class number
BH2	165399	2.5	5
BH3	165400	1.0	5
BH5	165401	1.0	6
BH6	165402	2.5	5

5. GEOTECHNICAL ASSESSMENT

5.1 Earthworks

5.1.1 Site Preparation and Structural Fill

Any additional site earthworks, if required, should be carried out in accordance with AS3798-2007 '*Guidelines on Earthworks for Commercial and Residential Developments.'*

5.1.2 Stripping

Prior to the placement of any further structural fill across the site (if required), any topsoil or loose stockpiles should be stripped to depths exposing competent ground.

ASCT should be engaged to confirm the suitability of the stripping depth and confirm the adequacy of the stripped surface prior to any further fill placement.

5.1.3 Compaction Requirements

If any further earthworks are planned, they should be carried out in a responsible manner in accordance with the relevant parts of AS3798 – 2007. It is recommended that all earthworks be carried out under Level 1 inspection and testing arrangements as detailed in clause 8.2 of AS3798-2007.

The stripped surface prior to filling should be tyned, moisture conditioned and re-compacted to the minimum density ratios detailed in AS 3798-2007.

All bulk fill materials should be placed in layers of approximately 200mm loose and be moisture conditioned within the range of ±2% of Optimum Moisture Content (OMC). Then compacted to the minimum density ratios detailed in AS 3798-2007.

Estimated long-term self-weight creep settlement of 0.5% to 1% the fill height could be expected for uniformly well compacted controlled fill.

Along the proposed roads, fill compaction and compaction of the natural soils should be to 100% Standard compaction (or as detailed in the Local council specifications or relevant project specifications).

5.1.4 Excavatability

To provide an assessment for the rippability / excavatability of the rock encountered during the geotechnical investigation, the work by Pettifer and Fookes (1994) was used as reference. The primary characteristic parameters of the material utilised for the assessment are the point load index test results and defect / fracture spacing of the rock mass.

Near surface residual soils and extremely low to very low strength rock are expected to easily removed in bulk and confined excavation using large hydraulic excavators (say 30 tonne) fitted with toothed buckets.

Excavations extended into the underlying low to medium strength rock mass are expected to be possible using conventional excavation plant consist of excavation say up to 30-60 tonne operating toothed bucket. Bulk excavations with tooth bucket with the assistance of ripping is generally achievable where digging / ripping is possible in a number of directions and rock can be "broken out" along bedding planes within the rock mass.

In confined areas (where it may not be possible to excavate in a number of directions), excavation may be difficult even with relatively large machines, and hydraulic rock breaking, ripping, trenching or blasting may be required to aid removal. Regardless of the methods adopted, excavation production is expected to be slow and result in plant wear.

There is potential for material strengths to vary spatially across the site and with depth owing to the varying degrees of metamorphism and weathering. Therefore, stronger ground conditions may be encountered intermediate to the borehole investigation locations. This potential variability should be allowed for when considering excavation methodology and project scheduling.

A graphical representation of the summarised excavatability based on point load strength indices and discontinuity spacing as suggested by Pettifer and Fookes (1994) is presented in Figure 5 below.

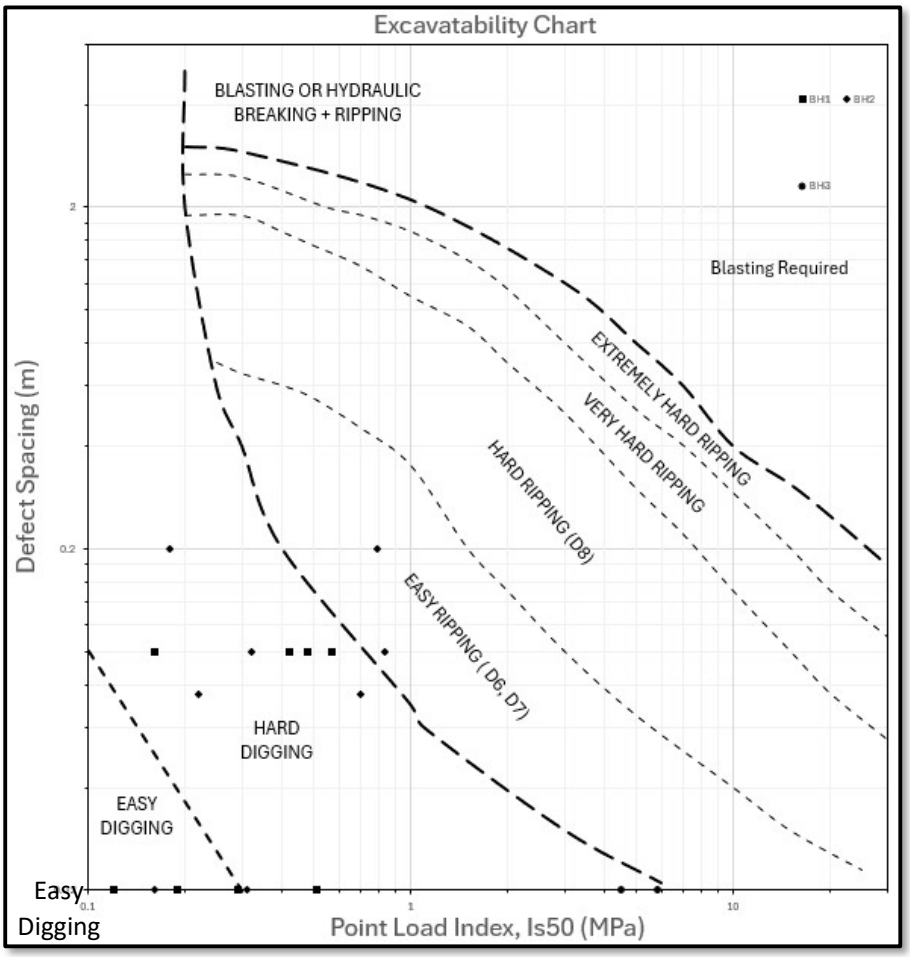


Figure 5: Markup of summarised excavatability chart with test samples (Pettifer and Fookes, 1994)

5.1.5 Reuse of Excavated Materials

Excluding any organic and deleterious materials, it is considered that the majority of materials won from excavation on site will generally be suitable for reuse as bulk filling provided that moisture content of the soils on placement approximates to the Optimum Moisture Content (OMC).

Where medium to high plasticity clays is proposed to be re-used as new structural filling materials in building or pavement areas, it is recommended that the cohesive material be placed at depth and

granular material be placed close to the subgrade level. This will reduce the effects of seasonal moisture changes and foundations soil reactivity and improve surface trafficability.

The selection and success of the above options will be dependent upon factors such as construction schedule, weather conditions at the time of placement, the size of area to be stabilised, site constraints like sloping terrain with any associated drainage issues or batters and limited area for moisture conditioning.

5.2 Preliminary Site Classification

Site classification in accordance with AS2870 "*Residential Slabs and Footings*" is determined based on the calculated ground surface movement due to normal seasonal moisture variations and physical properties of the reactive clay in association with environmental factors such as climate, vegetation and watering that affect the soils.

This applies to structures compliant to AS2870-2011 and typically includes up to 2 storey residential buildings or type structures for the design of foundations such as footings and slab. While the proposed residential development is outside the scope of the standard, it is generally a common, convenient, and generally widely used method of site reactivity assessment. It should be the responsibility of the designer to ensure that this methodology and the derived parameters are applicable for this site and proposed structures.

The above assessment is entirely based on the ground conditions and levels at the time of investigation and any alteration in these conditions by way of cut and fill operations may result in a change in soil reactivity and site classification.

5.2.1 Preliminary Site Classification

Based on the site conditions at the time of the investigation, proposed earthworks levels and local governing council landslide hazard overlay, it is considered that the site in the condition at the time of the investigation is classified as "P" in accordance with AS2870-2011. "P" Class sites do not inherently mean that the proposed works cannot be constructed but indicates that the site presents unique challenges that should be adequately addressed within the design. This report should be read in its entirety to ensure that the recommendations and comments involving the potential risks are understood. Upon completion of the proposed bulk earthworks, it is reasonably expected that the Characteristic Surface Movement (Ys), without abnormal moisture movements, of the site is to be in the order between 0 to 40mm range according to AS2870-2011 on FILL sites, whilst lots located primarily on rock cut sections are expected to have up to 20mm in range.

The above should be considered 'indicative' only and further detailed site classification should be carried out within the footprint of the proposed buildings. The predicted surface movement excludes any tree effects and FILL settlement.

5.2.2 Conditions / Limitations

The classification presented above is contingent up on the following conditions/ limitations and client/owner responsibilities:

i. All footings and structural elements of proposed structures and other additional works regardless of the site classification should be founded on strata of similar stiffness and reactivity to minimise the risk of differential settlements.

ii. The performance expectations set out in Appendix B of AS2870-2011 are acceptable, and that site foundation maintenance is undertaken to avoid extremes of wetting and drying, because any excessive moisture build-up from poor drainage due to potential flooding events can create subsurface soil weakening leading to ongoing related building and construction problems on reactive clays.

iii. Footings are to be founded outside of or below all zones of influence resulting from existing or future service trenches.

iv. The constructional and architectural requirements for reactive clay sites set out in AS2870-2011 are followed.

v. Adherence to the detailing requirements outlined in Section 5 of AS2870-2011 '*Residential Slabs and Footings'* is essential, in particular Section 5.6, '*Additional requirements for Classes M, H1, H2 and E sites*' including architectural restrictions, plumbing and drainage requirements.

vi. Site maintenance complies with the provisions of CSIRO Sheet BTF 18, "*Foundation Maintenance and Footing Performance: A Homeowner's Guide*". A copy of this document should be read and understood by the designer, builder and particularly the building owner and can be purchased by visiting https://www.publish.csiro.au/BuiltEnvironment/Building. The BTF-18 document is considered part of this report.

vii. More extensive discussion related to landscape planning and foundation maintenance including summary of house owner responsibilities is also available in "*A guide to preventing structural damage*" by Queensland Building and Construction Commission (QBCC). A copy of this document can be obtained by visiting QBCC website and considered part of this report.

viii. Any isolated and localised depressions formed due to removal of any previous vegetation and clearance activities should have all disturbed soil cleaned out and backfilled with compacted select fill material in accordance with AS3798-2007 "*Guidelines on Earthworks for Commercial and Residential Developments*" under Level 1 supervision and testing.

5.2.3 Tree Effects

As mentioned, the recommendations contained in this report may not accommodate the possible foundation movements induced by any new trees and shrubs. Trees and shrubs that can grow in the vicinity of footings can cause soil movements. Roots that grow under footings may increase in cross sectional size, exerting upwards pressure on footings. In addition, damage of structures can occur due to drying of reactive soils by tree root system.

Trees can be assumed to exert a drying effect over a radius 1.5X the **mature height** of the trees and 2.0X for a group or row of trees. As such, should the owners wish to incorporate trees and shrubs in the landscaping they must accept the risk of some distress to the foundations and buildings or increase the strength and stiffness of the footings in an attempt to limit potential future distress. It is important that the designer satisfy themselves as to the mature heights of the existing and proposed trees and hence the extent of potential wetting and drying related influence on the proposed construction envelope.

5.3 Retaining Wall Design Parameters

The parameters presented in Table 7 were inferred from the result of the sampling / testing, visual tactile assessments, published research and local experience.

Table 7: Summary of inferred characteristic retaining wall design parameters

Material Type	Consistency / Relative Density / Weathering	Unit Weight, γ (kN/m^3)	Effective Cohesion, c' (kPa)	Effective Friction Angle, ϕ' (degrees)
Cohesive – Controlled FILL		18	2	26
Cohesive	Stiff	17	2	26
	Very Stiff	18	4	26
	Hard	19	5	28
Cohesionless	Loose	17	-	28
	Medium Dense	18	-	30
	Dense	19	-	33
Weathered Rock	Low Strength	22	10	35
	Medium Strength	22	25	40

Allowance should be made for hydrostatic pressure build-up behind the temporary shoring. Also allowance for surcharge loads, and sloping crest should be made appropriate.

5.4 Foundation Options

Depending on the proposed structural loads and tolerance of the structures to the movement (such as load induced settlement and shrink-swell movements) and the anticipated subsurface conditions, it is considered that either high level footings or deep level footings may be adopted for the proposed structures.

The allowable bearing capacities shown in Table 8 may be used to assess the footing pressures that may be applied to the various strata by strip/pad footings without causing bearing capacity failure. Parameters below are considered indicative, natural ground conditions were not encountered during investigation. Further assessment is required to verify ground conditions at foundation level for any structures

Table 8: Allowable Bearing Capacities Strip/Pad footings

Material Type			Allowable Bearing Capacity (kPa)
Controlled FILL			100
NATURAL	Cohesive Soils	Stiff	100
		Very Stiff	150
		Hard	250
	Cohesionless Soils	Very Loose to Loose	Not Recommended
		Medium Dense	100
		Dense	300
	Weathered Rock	Low Strength	750
		Medium Strength	1500

It is recommended that all footing excavations should be inspected by an experienced geotechnical engineer to confirm bearing pressures prior to casting of concrete to confirm the suitability of the founding strata.

Where footings are founded in different compressibility materials (partly over controlled FILL and/or weathered rock and partly over stiff clay) there is potential for differential settlements across the structure which must be accounted for in the design through careful articulation and choice of construction materials for use in the structure.

For high level footings (loaded as above) within natural materials, it is considered that settlements under such applied loads will be less than 1-2% of footings width.

5.5 Safe Batter Slopes

Based on the materials encountered within the site, battered slopes may be adopted provided that the geometry, and the proximity of services and/or structures permit.

For initial design purposes, the following maximum batter slopes provided in Table 9 may be adopted for the cut and fill batters of the site with a relatively low risk of instability for un-surcharged batters up to 3.0m in vertical height if the batters are protected from groundwater and surface water effects. Batters higher than 3m should be assessed by a suitably qualified geotechnical engineer on an individual basis.

Table 9: Safe Batter Angles

Material Type	Short term (Maximum)	Long term (Maximum)
Existing 'Uncontrolled' FILL or firm natural CLAYS	1V:2H	See Note 1
Controlled FILL	1V:1.5H	1V:2H[(3)]
Stiff (or better) CLAYs	1V:1H	1V:2H[(3)]
Low strength rock	0.75V:1H	1V:1H[(4)]
Medium Strength (or better) rock	Near Vertical	0.25V:1H[(4)]

Notes:

1. Not Recommended, further assessment required
2. Assuming controlled fill is undertaken in accordance with recommendation in this report and AS3798
3. Surface / erosion protection is required in slopes with fine grained soils to reduce potential instability.
4. Long term cuts in weathered rock are heavily dependent on defect spacing and joint orientation within the rock matrix. These values are conditional with further geotechnical inspections required to assess no unfavourable joints are present. Unfavourable joint sets may lead to rock failure mechanisms such as toppling, wedge or plane failure. Berms may be required at 6m high vertical intervals.

The above temporary batter slopes are suggested with respect to stability of the slope only and do not account for soil stress relaxation which may result in movement of adjacent services or shallow footings. Settlement sensitive structures within the zone of influence of the batters may require further assessment and support. If steeper than recommended batters are proposed, then it is recommended to engage a suitably qualified geotechnical engineer.

It is recommended that geotechnical inspection of cut faces be included during the batter excavation to identify any weaker zones or potential wedge failures, which may require the use of shotcrete and mesh and rock bolts or anchors. Where large slopes are adopted in soils or very low strength rock, the use of mesh reinforced concrete with dowel support is recommended to protect the slopes from erosion. Adequate drainage measures are required through and behind the shotcrete.

For both soil and rock batters, it is recommended that intermediate benches be graded to divert surface runoff away from the crests, thus allowing benches to drain sideways, and reduce the risk of small rock falls being caused by erosion. These intermediate bench drains are in addition to the use of crest drains and toe drains to remove surface water from the batters. Leading runoff into concrete lined longitudinal drains is commonly used in significant cut slopes to reduce the risk of the erosion of the batters.

It is recommended that crest and toe drainage and surface protection be incorporated in all permanent batters to assist in removal of surface water from the batters.

5.6 Pavement Subgrade

A total of two (2) bulk subgrade samples were selected and tested from the overlying soil types encountered at the proposed roadways. The CBR tests were performed on samples compacted to the target density ratio of 100% of standard maximum dry density at about standard optimum moisture content.

The 4-day-soaked California Bearing Ratio (CBR) tests indicated values of between 3.0% and 8.0%.

Based on the laboratory results, and potential for human-induced variation throughout the proposed development area and to allow for natural variations for the design of either flexible sealed, unsealed granular or rigid concrete pavements subjected to vehicular trafficking, it is recommended that a CBR values of 15 - 60% may be adopted as a preliminary basis for pavement design. Additional CBR sampling and testing may be required if ground conditions are observed to differ.

Based on Austroad's Publication '*Guide To Pavement Technology, Part 2: Pavement Structural Design*',

Section 5.6 specifies a modulus of subgrade can be estimated as:

Modulus of Subgrade (MPa) = 10 x CBR

It is noted in this document that this relationship is an approximation, and the modulus values have been found to vary between 5 x CBR to 20 x CBR. For the design of pavement areas, the following design parameters can be considered.

Table 10: Pavement Design Parameters

Subgrade Material	Design CBR (%)	Modulus of Subgrade Reaction (MPa)
Sandy Gravelly CLAY	3	30

Proper drainage measures should be adopted to ensure that the subgrade and pavement do not become saturated in service. Upon closer inspection of the exposed subgrade, should a weaker subgrade material than the anticipated is encountered consideration should be given to removing and replacing the weak strata with a higher quality material or reassessing the pavement design.

5.7 Fill settlement and differential settlement

No matter how well any FILL is compacted, all FILLs undergo settlement over long term. As the fill depths vary across the proposed structure footprint even within small distances, the potential risk for differential settlement in the new filling, particularly in the deeper fill areas will need to be considered when designing slabs and foundations for the proposed structures.

As a rule of thumb, long term settlement (i.e., over 20 years) in a controlled FILL is estimated to be approximately 1% of the fill thickness and occurs over a logarithmic time scale. The level of settlement for uncontrolled FILL cannot be easily quantified, and it is recommended that it is not relied upon as a founding material.

If the differential settlements cannot be accommodated in the slab design, then the slab in the deeper fill areas need to be fully suspended, founding on piles into stronger relative density / consistency materials below the filling. ASCT should be contacted if further detailed settlement modelling to further quantify likely settlement is required.

5.8 Soil Dispersion Risk

An Emerson Class number of 1 indicates a strongly dispersive soil, an Emerson Class number of 2 indicates a high risk of significant soil dispersion; an Emerson number of 3 indicates a moderate risk of significant soil dispersion; whilst an Emerson number ranging between 4 and 8 indicates a soil with low to negligible dispersion tendencies.

Emerson class testing undertaken on four (4) samples collected at the borehole locations result in Emerson Class numbers between 5 – 6, indicating a low risk of soil dispersion at the test locations.

6. LIMITATIONS

The geotechnical investigation report is based on the results of the site investigation at random locations at the captioned location.

The discussion and recommendations outlined within this report are typically based on assessment of the site conditions through discrete borehole and laboratory test result information. The generalised subsurface information within this report is based on extrapolation / interpretation of the information available which must be considered as a guide only.

As the subsurface layers are inherently heterogeneous and could have been formed by various geological, environmental, and physio-chemical processes including human induced changes (during the ongoing bulk earthworks), there is potential for soil properties to exhibit spatial variability both in vertical and horizontal directions. As such, if the site conditions encountered during proposed construction works vary from the inferred conditions, it is necessary to re-evaluate the recommendations of this report. This office should be contacted for further assessment, if required.

Should you have any further queries in relation to this report, please do not hesitate to contact the undersigned on 0424 760 584.

For and on behalf of ASCT Brisbane South.

Prepared by	Reviewed by	Approved by
Ryan Hay	**Nicholas Brunott**	**Jason Mckenna**
Undergraduate Engineer	Senior Engineer	Director
	RPEQ #36854	ASCT – Brisbane South

ATTACHMENTS

i. General Notes
ii. Soil Description
iii. Borehole Logs
iv. Laboratory Test Results

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GENERAL NOTES

- ***GENERAL***

This report includes the results of an investigation undertaken for particular objectives and client as specified in the introduction section (s) of the document. This report should not be used by other parties or for other objectives as it may not include the adequate or relevant information.

- ***SOIL PROFILE LOGGING***

The information provided on the field work logs (such as test pits, boreholes, exposures etc.,) has been based on visual and tactile assessment of the soils encountered at the time of investigation except at the specific locations where relevant test information is available (field or laboratory test results)

Our standard sheets for the definition of our logging procedures (Soil and Rock Descriptions) should be referred in conjunction with field work logs for information.

- ***GROUNDWATER LEVELS***

If not specifically provided, the water levels shown on the field work logs are the levels of free water or seepage in the test hole recoded at the given time of measuring. Depending on the soil permeabilties, the actual groundwater level may differ from this recorded level. In addition, with time, further variation could also occur due to the effects of seasonal or tidal fluctuations or construction activities. As such, final confirmation of water level can only be made by suitable instrumentation techniques and programmes, if specifically required.

- ***RESULTS INTERPRETATION***

The discussion, recommendations and conclusions provided in this report are generally based on a site specific assessment from discrete test hole data. Generalised or idealised subsurface conditions (including any cross-sections contained in the report) have been assumed or prepared by interpolation/extrapolation of this specific data. As such, these conditions are an interpretation and must be considered as a guide only.

- ***CHANGE IN CONDITIONS***

Local dissimilarities or anomalies can occur in the generalised ground conditions used for this report, particularly between discreet test hole locations. Furthermore, certain design or construction procedures may have been assumed in assessing the soil structure interaction behaviour of the site.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed in this report should be referred to this company for appropriate assessment and comment.

- ***FOUNDATION DEPTH***

Where referred to in this report, the recommended depth of any foundation (footings, piles etc.,) is an engineering estimate of the depth to which they should be constructed. The estimate is influenced and perhaps limited by the field work method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The depth remains, however, an estimate only and therefore liable to variation. Footing drawings, designs and specifications based upon this report should provide for variations in the final depth depending upon the ground conditions at each point of support.

- ***LABORATORY TESTING***

Samples extracted during the fieldwork stage of a site investigation may be “disturbed” or “undisturbed” (as generally indicated on the borehole or test pit logs) depending upon the nature and purpose of the sample and method of extraction. Normally “undisturbed” samples may suffer a varying degree of disturbance during the extraction, transportation, extrusion and testing. This aspect should be taken into account when assessing test results which must be of necessity reflect the effects of such disturbance.

All soil properties (as measured by laboratory testing) exhibit inherent variability and thus a certain statistical number of tests is required in order to predict the average property with any degree of confidence. The site variability of soil strata, future changes in moisture and other conditions, and the discreet sampling positions must also be considered when assessing the representative nature of the laboratory programme.

Certain laboratory test results provide interpreted soil properties as derived by conventional mathematical procedures. The applicability of such properties to engineering design must be assessed with due regard to the site, sample condition, procedure and project in hand.

- ***REPRODUCTION OF REPORTS***

Where it is desired to reproduce the information contained in this report for the inclusion in the contract documents or engineering specification of the subject development, such reproduction should include at least all the relevant test hole and test data, together with the appropriate standard description sheets and remarks made in written report of a factual or descriptive nature.

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SOIL DESCRIPTION

This procedure involves the description of a soil in terms of its visual and tactile properties, and relates to both laboratory samples and field exposures as applicable. A detailed soil profile description, in association with local geology and experience, will facilitate the initial (and often complete) site assessment for engineering purposes.

The method involves an evaluation of each of the items listed below and is in general agreement with the Australian Standard *AS1726 – 2017 Geotechnical Site Investigations*.

- ***SOIL TYPE***

The soil is described on the basis of the grain size composition of the constituent particles, and plasticity of the fraction of material passing the 425µm sieve. Furthermore, as most natural soils are part combinations of various constituents, the primary soil is described and modified by minor components. In brief, the system is as follows

Silt or clay as minor component (Fine grained soils)		Sand or Gravel as minor component (Coarse grained soils)	
% Fines	Modifier	% Coarse	Modifier
≤ 5	Omit or use 'trace'	≤ 15	omit or use 'trace'
> 5 ≤ 12	Describe as 'with clay/silt', as applicable	> 15 ≤ 30	Describe as 'with sand / gravel' as applicable
> 12	Prefix soil as 'silty/clayey' as applicable	> 30	Prefix soil as 'sandy / gravelly' as applicable

Note: for soils containing both sand/gravels, the minor coarse fraction is omitted if less than 15%, or described as 'with sand/gravel' as applicable if greater than 15%.

The appropriate classification group symbol for soil classification is also given before the soil type description in accordance with AS 1726-1993, Table A1.

For granular soils, an assessment of grading (well, uniform, gap or poor), particle size (fine, medium etc.,), angularity, shape and particle composition may also be given.

- ***COLOUR***

Colour is important for correlation of data between test holes and for subsequent excavation operations. The prominent colour is noted, followed by (spotted, mottled or streaked etc.,) secondary colour as applicable. Colour should be described in the 'moist' condition, though both wet and dry colours may also be appropriate.

- ***MOISTURE CONDITION***

The moisture condition of the soil is described by the appearance and feel of the soil using one of the following items.
Dry: Cohesive soils – hard, friable or powdery; Granular soils – cohesionless, free funning
Moist: soil cool, darkened colour. Cohesive soils – can be moulded; Granular soils – tend to cohere
Wet: soil cool, darkened colour. Cohesive soils – usually weakened, free water on hands when handling; Granular soils – tend to cohere

- ***CONSISTENCY / RELATIVE DENSITY***

Granular soils are generally described in terms of relative density (density index) as listed in Table A5 of AS1726. These soils are inherently difficult to assess and normally a penetration test procedure (SPT, DCP or CPT) is used in conjunction with published correlation tables. Alternatively, insitu density tests can be conducted in association with minimum and maximum densities performed in the laboratory.

Cohesive soils can be assessed by direct measurement (shear vane), or estimated approximately by tactile means and/or the aid of geological pick as given on the following table. It is emphasised that a 'design shear strength' must take cognisance of the insitu moisture content and the possible variations of the moisture with time.

Term	Tactile Properties	Undrained Shear Strength (kPa)
Very soft	Exudes between fingers when squeezed in the hand	≤ 12
Soft	Easily penetrated by thumb about 30-40mm. Pick head can be pushed up to shaft. Moulded by light finger pressure	12 - 25kPa
Firm	Penetrated by thumb 20-30mm with moderate effort. Sharp end of pick can be pushed in some 30-40mm. Moulded by strong finger pressure.	25 - 50kPa
Stiff	Indented by thumb about 4mm with moderate effort. Pick pushed in up to 10mm. cannot be moulded by fingers.	50 - 100kPa
Very Stiff	Readily indented by thumb nail. Slight indentation produced y pushing pick into soil	100 - 200kPa
Hard	Difficult to indent with thumb nail. Requires power tools for excavation.	>200kPa

Term	Density Index	SPT "N"	CPT Cone Resistance
Very loose	<15%	0 - 5	0 - 2MPa
Loose	15 - 35%	5 -10	2 - 5MPa
Medium Dense	35 - 65%	10 - 30	5 - 15MPa
Dense	65 - 85%	30 - 50	15 - 25MPa
Very Dense	>85%	>50	>25MPa

- ***STRUCTURE / OTHER FEATURES***

The structure of the soil may be described with reference to: zoning, where soils consist of separate zones differing in colour, grain size or other properties; defects, including fissures, cracks, root holes and the like; cementing with the strength and nature of cementing agents.

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Geotechnical Log - Borehole

BH 1

Easting	: 515729.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933630.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 7 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			0.20		NATURAL Sandy GRAVEL (GW): fine to coarse sized, sub-rounded to sub-angular, medium dense, brown mottled grey, fine to medium grained sand, moist.	
			0.50		NATURAL Clayey Sandy GRAVEL (GC): fine to medium sized, sub-angular, medium dense to dense, pale brown, fine to medium grained sand, medium plasticity clay, moist.	
			1.00		Interbedded METASANDSTONE and PHYLLITE (XW) - recovered as Gravelly Sandy CLAY - low plasticity, very stiff to hard, mottled pale brown and pale grey, fine to medium grained gravel, fine to coarse grained sand, moist	SPT 1.0-1.1m, 30/100 N=30
Washbore			2.00			
			2.50		Interbedded METASANDSTONE and PHYLLITE (HW-MW): highly to moderately weathered, fine grained METASANDSTONE interlaminated to thinly interbedded with PHYLLITE; pale grey to red brown, mottled orange brown and dark red;	SPT 2.5-2.55m, 30/50 N=30
					Commenced Coring at 3 m	

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Geotechnical Log - Borehole

BH 1

Easting	: 515729.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933630.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 7 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	RQD	Estimated Strength	Defect Spacing	Defect Description
	1.0							● - Axial ○ - Diametral Very Low 0.03 Low 0.1 Medium 3 High 1 Very High Extremely High	30 100 300 1000 3000	
	2.0									
	3.0				**Commenced Coring at 3 m**					
NMLC Coring					Interbedded METASANDSTONE and PHYLLITE (HW-MW): highly to moderately weathered, fine grained METASANDSTONE interlaminated to thinly interbedded with PHYLLITE; pale grey to red brown, mottled orange brown and dark red;	XW DW HW MW SW F	RQD = 0% TCR = 100%	● ○		FZ, I P, 45°, PL, SO, CL, OP
	4.0						RQD = 11.11% TCR = 100%	● ○		FZ, I JT, 40°, IR, RO, CT, I P, 45°, PL, SO, CL, OP JS, 25°, IR, RO, CL, OP XWS P, PL, SO, CL, OP P, 45°, PL, SO, CL, OP CS, 45°, IR, VR, CT, I P, 45°, PL, SO, CL, OP FZ
	5.0						RQD = 0% TCR = 100%			P, 50°, PL, SO, CL, OP CS, 45° CS, 45° P, 45°, PL, SO, CL, OP JT, 45°, PL, SO, CL, OP IS, fine gravel P, 45°, PL, SO, CL, OP P, 35°, PL, SO, CL, OP P, 45°, PL, SO, CL, OP FZ JT, 20°, IR, RO, CL, OP
	6.0						RQD = 0% TCR = 100%	○ ●		P, 50°, PL, SO, CL, OP JT, 20°, IR, VR, CL, OP JT, 50°, PL, RO, CL, OP JT, 40°, PL, SO, I, clay P, 40°, UN, SO, STN, OP P, 45°, PL, SO, CT, I FZ
							RQD = 0% TCR = 100%	○		JT, 20°, IR, SO, CL, OP JT, 30°, PL, RO, CL, OP JT, 80°, IR, RO, STN, OP P, 45°, PL, SO, CL, OP P, 45°, PL, SO, CL, OP
					BH 1 Terminated - Target depth at 7.0 m					

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Geotechnical Log - Borehole

BH 2

Easting	: 515737.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933590.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 13.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			0.20		NATURAL Sandy GRAVEL (GW): fine to coarse sized, sub-rounded to sub-angular, medium dense, brown mottled grey, fine to medium grained sand, moist.	
			1.00		NATURAL Gravelly Sandy CLAY (CI): medium plasticity, very stiff, orange brown mottled pale grey, fine to medium grained sand, w = pl.	SPT 1.0-1.45m, 7, 11, 12 N=23
			2.00			
			2.30		Interbedded METASANDSTONE and PHYLLITE (XW-HW): extremely to highly weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite.	SPT 2.5-2.63m, 30/130 N=30

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Geotechnical Log - Borehole

BH 2

Easting	: 515737.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933590.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 13.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Washbore					Interbedded METASANDSTONE and PHYLLITE (XW-HW): extremely to highly weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite. (continued)	
			4.00		Interbedded METASANDSTONE and PHYLLITE (HW): highly weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite.	SPT 4.0-4.1m, 30/100 N=30
			5.00			SPT 5.5-5.57m, 30/70 N=30
			5.60		**Commenced Coring at 5.6 m**	

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Geotechnical Log - Borehole

BH 2

Easting	: 515737.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933590.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 13.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering (KW, DW, HW, MW, SW, F)	RQD	Estimated Strength (● Axial, ○ Diametral; Very Low, Low, Medium, High, Very High, Extremely High)	Defect Spacing (30, 100, 300, 1000, 3000)	Defect Description
	1.0									
	2.0									
	3.0									
	4.0									
	5.0				**Commenced Coring at 5.6 m**					
NMLC Coring	6.0	ROCK		PHY	Interbedded METASANDSTONE and PHYLLITE (HW): highly weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite.		RQD = 17.14% TCR = 85.71%	○ ●		FZ CS, 35°, IR, RO, CL, OP JT, 45°, IR, PL, RO, CL, OP JT, 15°, IR, RO, CL, OP JT, 15°, IR, RO, CL, OP JT, 20°, IR, RO, STN, OP JT, 50°, PL, RO, CL, OP JT, 50°, PL, RO, CL, OP FZ

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Geotechnical Log - Borehole

BH 2

Easting	: 515737.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933590.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 13.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering	RQD	Estimated Strength	Defect Spacing	Defect Description
NMLC Coring	8.0	ROCK		PHY	Interbedded METASANDSTONE and PHYLLITE (HW): highly weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite. (continued)	KW DW HW MW SW F	RQD = 23.2% TCR = 100%	● Axial ○ Diametral; Very Low 0.1 Low 0.3 Medium 1 High 3 Very High 10 Extremely High	30 100 300 1000 3000	JT, 20°, IR, RO, CL, OP JS, 40°, UN, RO, STN, OP JT, 65°, PL, SO, STN, OP
	9.0									JT, 20°, PL, SO, CL, OP JT, 5°, PL, SO, CL, OP FZ JT, 45°, IR, RO, CL, OP P, 5°, PL, RO, VR, CL, OP P, 15°, PL, SO, STN, OP FZ
	10.0	ROCK		PHY	Interbedded METASANDSTONE and PHYLLITE (MW): moderately weathered, fine grained METASANDSTONE, grey with orange brown iron staining, thinly interbedded with dark grey to black phyllite.		RQD = 0% TCR = 100%			P, 25°, PL, SO, STN, OP IS, PL, SO, STN, I, clay infill JT, 45°, PL, SO, CL, OP FZ, 0-50mm spacing, 0-45 degrees
	11.0						RQD = 0% TCR = 100%			P, 60°, UN, RO, CL, OP CS, 10°, I JS, 15°, PL, UN, SO, CL, OP JS, 30°, PL, RO, CT, OP FZ
	12.0						RQD = 0% TCR = 100%			P, 30°, PL, SO, CL, OP P, 45°, UN, SO, CL, OP JT, 50°, PL, RO, CL, OP P, 25°, PL, SO, STN, OP
	13.0									JT, 0°, IR, RO, CL, OP P, 35°, PL, SO, CL, OP FZ, 50°, IR, SO, RO, CL, OP CS, 25°, PL, SO, CT, I CS, 25°, PL, SO, CT, I FZ, 30°, PL, SO, CL, OP CS, 20°, IR, RO, CT, I P, 15°, PL, SO, CL, OP
					BH 2 Terminated - Target depth at 13.5 m					

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Geotechnical Log - Borehole

BH 3

Easting	: 515739.44	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933496.75	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 6.65 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger					NATURAL Gravelly SAND (SW): fine to medium grained, medium dense to dense, pale brown mottled pale grey, fine sized gravel, moist.	
			1.00		NATURAL Gravelly SAND (SW): fine to medium grained, medium dense to dense, pale brown mottled pale grey, fine sized gravel, with low plasticity clay, moist.	SPT 1.0-1.45m, 3, 6, 14 N=20
			1.50		Interbedded CHERT and SILTSTONE (HW) - recovered as Clayey Sandy GRAVEL: fine to coarse sized, sub-angular to angular, dense, mottled pale grey and pale brown, fine grained sand, low to medium plasticity clay, moist.	
Washbore			2.00			SPT 2.5-2.75m, 15, 30/100 N=30

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Geotechnical Log - Borehole

BH 3

Easting	: 515739.44	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933496.75	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 6.65 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Washbore			4.00		Interbedded CHERT and SILTSTONE (HW) - recovered as Clayey Sandy GRAVEL: fine to coarse sized, sub-angular to angular, dense, mottled pale grey and pale brown, fine grained sand, low to medium plasticity clay, moist. (continued)	SPT 4.0-4.2m, 23, 30/50 N=30
			5.00			
			5.50		Interbedded CHERT and SILTSTONE (DW): distinctly weathered, very fine grained, medium to high strength, mottled dark to pale grey and pale brown.	SPT 5.5-5.63m, 30/130 N=30
					Commenced Coring at 6 m	

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Geotechnical Log - Borehole

BH 3

Easting	: 515739.44	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933496.75	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 6.65 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Weathering (XW, DW, HW, MW, SW, F)	RQD	Estimated Strength (Very Low 0.03, Low 0.1, Medium 3, High 1, Very High, Extremely High; ● Axial, ○ Diametral)	Defect Spacing (30, 100, 300, 1000, 3000)	Defect Description
	1.0									
	2.0									
	3.0									
	4.0									
	5.0									
	6.0				**Commenced Coring at 6 m**					
NMLC Coring					Interbedded CHERT and SILTSTONE (DW): distinctly weathered, very fine grained, medium to high strength, mottled dark to pale grey and pale brown.		RQD = 0% TCR = 100%	○		FZ FZ FZ
							RQD = 0%			
					BH 3 TC bit refusal at 6.7 m					

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Geotechnical Log - Borehole

BH 4

Easting	: 515735.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933448.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 8.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			0.20		NATURAL Silty SAND (SM): fine to medium grained, medium dense, dark brown, trace fine to medium gravel, moist.	
			0.50		NATURAL Sandy GRAVEL (GW): fine to medium sized, sub-angular, medium dense, grey brown, fine to medium grained sand, moist.	
			1.00		NATURAL Clayey SAND (SC): fine to medium grained, medium dense, pale brown, low plasticity clay, trace fine gravel, moist.	SPT 1.0-1.45m, 7, 14, 15 N=29
Washbore			2.00 2.00		Interbedded CHERT and SILTSTONE (HW): highly weathered, very fine grained, medium strength, mottled dark to pale grey and pale brown.	SPT 2.5-2.61m, 30/110 N=30

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Phone: (07) 3800 7314

Geotechnical Log - Borehole

BH 4

Easting	: 515735.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933448.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 8.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Washbore			4.00		Interbedded CHERT and SILTSTONE (HW): highly weathered, very fine grained, medium strength, mottled dark to pale grey and pale brown. (continued)	SPT 4.0-4.15m, 30/150 N=30
			5.00			SPT 5.5-5.63m, 30/130 N=30

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Geotechnical Log - Borehole

BH 4

Easting	: 515735.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933448.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 8.5 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Washbore					Interbedded CHERT and SILTSTONE (HW): highly weathered, very fine grained, medium strength, mottled dark to pale grey and pale brown. (continued)	
			7.00			SPT 7.0-7.11m, 30/110 N=30
			8.00			SPT 8.5-8.59m, 30/90 N=30
					BH 4 Terminated - Target depth at 8.5 m	

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Geotechnical Log - Borehole

BH 5

Easting	: 515651.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933570.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 4 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			0.20		NATURAL Silty SAND (SM): fine to medium grained, loose, brown, moist.	
			1.00		NATURAL Silty CLAY (CH): high plasticity, stiff, mottled brown and grey, with fine to medium sand, w > pl.	SPT 1.0-1.45m, 3, 4, 19 N=23
			1.60		Interbedded CHERT and SILTSTONE (HW): highly weathered, very fine grained, low to medium strength, mottled dark to pale grey and pale brown.	
			2.00			SPT 2.5-2.9m, 18, 21, 30 N=51

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Geotechnical Log - Borehole

BH 5

Easting	: 515651.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933570.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 4 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger					Interbedded CHERT and SILTSTONE (HW): highly weathered, very fine grained, low to medium strength, mottled dark to pale grey and pale brown. (continued)	SPT 4.0-4.38m, 21,28,30/80 N=58
					BH 5 Terminated - Target depth at 4.0 m	

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Geotechnical Log - Borehole

BH 6

Easting	: 515709.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933474.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 4.27 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			0.50		NATURAL Sandy GRAVEL (GW): fine to coarse sized, sub-angular, medium dense, brown mottled grey, fine to medium grained sand, moist.	
			1.00		NATURAL Clayey Gravelly SAND (SC): fine to medium grained, medium dense, orange brown, fine to medium sized gravel, low plasticity clay, moist.	
			1.00		NATURAL Gravelly Sandy CLAY (CI): medium plasticity, very stiff to hard, mottled pale brown and pale grey, fine to medium grained sand, w = pl.	SPT 1.0-1.45m, 5, 6, 6 N=12
			1.60		Interbedded METASANDSTONE and PHYLLITE (XW) - recovered as Gravelly SAND (SW): fine to medium grained, dense, orange brown, fine to medium sized gravel, with low plasticity clay, moist.	SPT 2.5-2.9m, 20, 22, 30/100 N=52
			2.00			

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Geotechnical Log - Borehole

BH 6

Easting	: 515709.00	Location	: 381 Wuraga Rd, Bahrs Scrub QLD 4207	Job Number	: 2854
Northing	: 6933474.00	Logged By	: TE	Client	: Arcoterra Pty Ltd
Total Depth	: 4.27 m	Date	: 08/07/2026	Project	: Geotechnical Investigation

Drilling Method	DCP (2 4 6 8 10 12 14 16 18 20)	Water	Depth (m)	Graphic Log	Material Description	Samples
Auger			4.00		Interbedded METASANDSTONE and PHYLLITE (XW) - recovered as Gravelly SAND (SW): fine to medium grained, dense, orange brown, fine to medium sized gravel, with low plasticity clay, moist. (continued)	SPT 4.0-4.27m, 24, 30/120 N=30
					BH 6 Terminated - Target depth at 4.3 m	

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WB080 - Rev 43,15/06/2026

Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**1**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 10/07/2026 to 14/07/2026	Control Line:	

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165335	**9/07/2026**	**BH5**	**-**	**0.6-0.8m**	**200**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

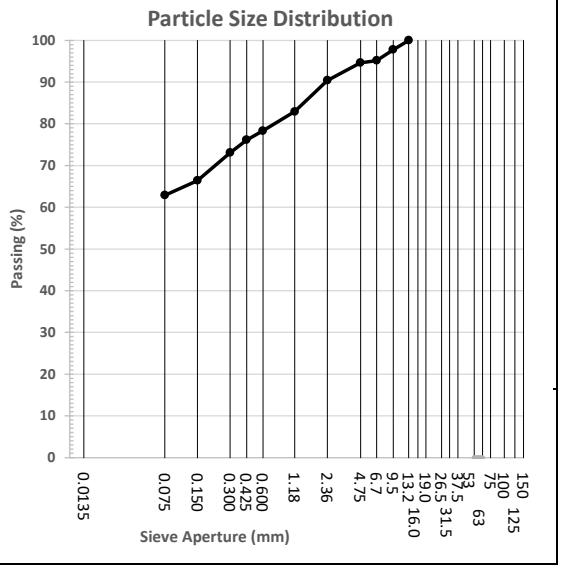
AS 1289.1.2.1, Cl 6.5.3: (1998)Disturbed Soil Sampling - Powered - Auger
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.1.2: (2009)Determination of Liquid Limit (1 point Casagrande)
AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
PSD: Ratios, Co-efficients & Weighted Indices **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.2.1: (2009) Determination of the Plastic Limit
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil

Report Remarks & Endorsement

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NATA Accreditation number: 19902

Issued By: A.Lenkeit
Approved Signatory

Specification Name				
Particle Size Distribution	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%			
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**100**		
Passing 9.5mm Sieve	%	**98**		
Passing 6.7mm Sieve	%	**95**		
Passing 4.75mm Sieve	%	**95**		
Passing 2.36mm Sieve	%	**90**		
Passing 1.18mm Sieve	%	**83**		
Passing 0.600mm Sieve	%	**78**		
Passing 0.425mm Sieve	%	**76**		
Passing 0.300mm Sieve	%	**73**		
Passing 0.150mm Sieve	%	**66**		
Passing 0.075mm Sieve	%	**63**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 43,15/06/2026

Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**1**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 2 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 10/07/2026 to 14/07/2026	Control Line:	

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165335	**9/07/2026**	**BH5**	**-**	**0.6-0.8m**	**200**

Moisture, Ratios, Coefficients & Indices	Units	**Result**	**Specification Limits**	**Remarks**
Weighted Plasticity Index (WPI)	--	**1523**		Passing 0.425mm * Plasticity Index
Weighted Linear Shrinkage (WLS)	--	**761**		Passing 0.425mm * Linear Shrinkage
Fines Ratio (FR)	--	**0.83**		Passing 0.075mm / Passing 0.425mm
Plasticity	Units	**Result**	**Specification Limits**	**Remarks**
Liquid Limit	%	**40**		Oven Dried & Dry Sieved
Plastic Limit	%	**20**		Oven Dried & Dry Sieved
Plastic Index	%	**20**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**10.0**		Mould length: 249.8 mm Condition of dry specimen: Single/Straight Bar

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Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**2**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 03/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165396	**2/07/2026**	**BH2**	**-**	**1.0m**	**-**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

3rd Party: Determined Sampling Locations **	AS 1289.1.2.1, Cl 6.7: (1998)Disturbed Soil Sampling - OpenDrive Sampler
AS 1289.1.1: (2001)Preparation of disturbed soil samples	AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil	AS 1289.3.1.2: (2009)Determination of Liquid Limit (1 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit	AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil	PSD: Ratios, Co-efficients & Weighted Indices **

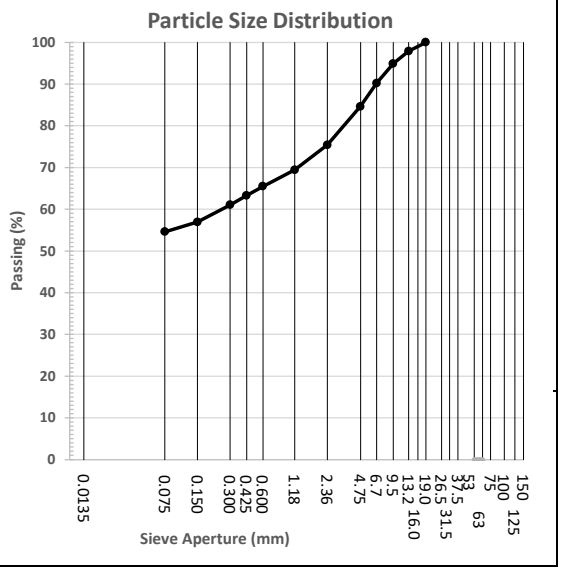
Report Remarks & Endorsement

NATA

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NATA Accreditation number: 19902

Issued By: A.Lenkeit
Approved Signatory

Specification Name				
Particle Size Distribution	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%	**100**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**98**		
Passing 9.5mm Sieve	%	**95**		
Passing 6.7mm Sieve	%	**90**		
Passing 4.75mm Sieve	%	**85**		
Passing 2.36mm Sieve	%	**75**		
Passing 1.18mm Sieve	%	**69**		
Passing 0.600mm Sieve	%	**65**		
Passing 0.425mm Sieve	%	**63**		
Passing 0.300mm Sieve	%	**61**		
Passing 0.150mm Sieve	%	**57**		
Passing 0.075mm Sieve	%	**55**		
Passing 0.0135mm Sieve	%			



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Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**2**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 2 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 03/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165396	**2/07/2026**	**BH2**	**-**	**1.0m**	**-**

Moisture, Ratios, Coefficients & Indices	Units	**Result**	**Specification Limits**	**Remarks**
Weighted Plasticity Index (WPI)	--	**1139**		Passing 0.425mm * Plasticity Index
Weighted Linear Shrinkage (WLS)	--	**569**		Passing 0.425mm * Linear Shrinkage
Fines Ratio (FR)	--	**0.86**		Passing 0.075mm / Passing 0.425mm
Plasticity	Units	**Result**	**Specification Limits**	**Remarks**
Liquid Limit	%	**44**		Oven Dried & Dry Sieved
Plastic Limit	%	**26**		Oven Dried & Dry Sieved
Plastic Index	%	**18**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**9.0**		Mould length: 249.9 mm Condition of dry specimen: Cracked/Broken Bar

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Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	3
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 06/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165397	3/07/2026	BH5	-	2.5m	-

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

3rd Party: Determined Sampling Locations **	AS 1289.1.2.1, Cl 6.7: (1998)Disturbed Soil Sampling - OpenDrive Sampler
AS 1289.1.1: (2001)Preparation of disturbed soil samples	AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil	AS 1289.3.1.2: (2009)Determination of Liquid Limit (1 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit	AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil	PSD: Ratios, Co-efficients & Weighted Indices **

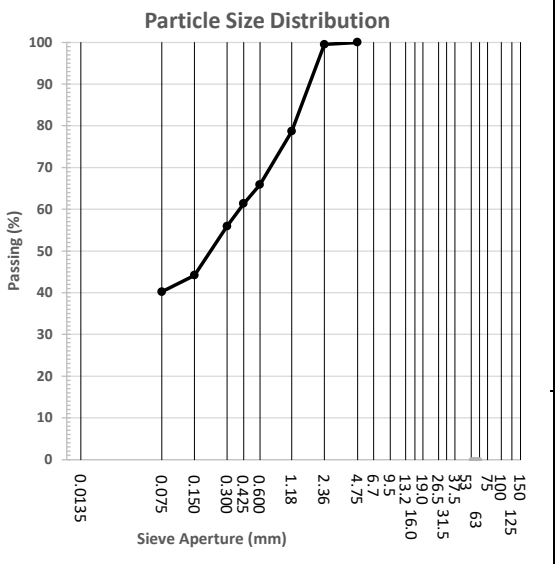
Report Remarks & Endorsement

NATA

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NATA Accreditation number: 19902

Issued By: A.Lenkeit
Approved Signatory

Specification Name				
Particle Size Distribution	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%			
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%			
Passing 9.5mm Sieve	%			
Passing 6.7mm Sieve	%			
Passing 4.75mm Sieve	%	**100**		
Passing 2.36mm Sieve	%	**100**		
Passing 1.18mm Sieve	%	**79**		
Passing 0.600mm Sieve	%	**66**		
Passing 0.425mm Sieve	%	**61**		
Passing 0.300mm Sieve	%	**56**		
Passing 0.150mm Sieve	%	**44**		
Passing 0.075mm Sieve	%	**40**		
Passing 0.0135mm Sieve	%			



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Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**3**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 2 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 06/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165397	**3/07/2026**	**BH5**	**-**	**2.5m**	**-**

Moisture, Ratios, Coefficients & Indices	Units	**Result**	**Specification Limits**	**Remarks**
Weighted Plasticity Index (WPI)	--	**491**		Passing 0.425mm * Plasticity Index
Weighted Linear Shrinkage (WLS)	--	**215**		Passing 0.425mm * Linear Shrinkage
Fines Ratio (FR)	--	**0.66**		Passing 0.075mm / Passing 0.425mm
Plasticity	Units	**Result**	**Specification Limits**	**Remarks**
Liquid Limit	%	**27**		Oven Dried & Dry Sieved
Plastic Limit	%	**19**		Oven Dried & Dry Sieved
Plastic Index	%	**8**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**3.5**		Mould length: 249.8 mm Condition of dry specimen: Cracked/Broken Bar

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WB080 - Rev 43,15/06/2026

Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**4**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 03/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165398	**1/07/2026**	**BH6**	**-**	**1.0m**	**-**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

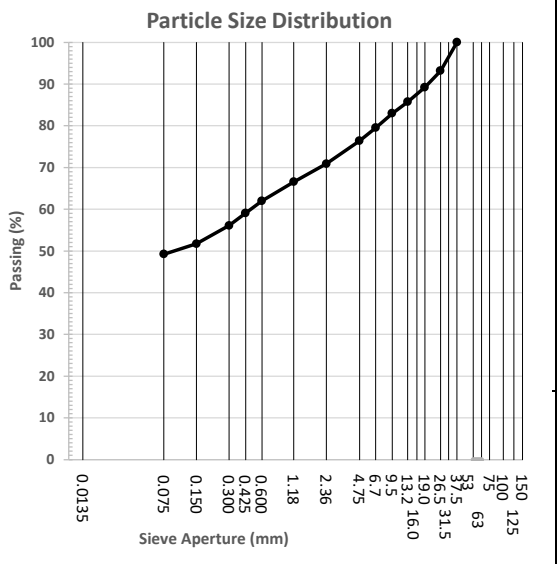
3rd Party: Determined Sampling Locations **	AS 1289.1.2.1, Cl 6.7: (1998)Disturbed Soil Sampling - OpenDrive Sampler
AS 1289.1.1: (2001)Preparation of disturbed soil samples	AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil	AS 1289.3.1.2: (2009)Determination of Liquid Limit (1 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit	AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil	PSD: Ratios, Co-efficients & Weighted Indices **

Report Remarks & Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 19902

Issued By: A.Lenkeit
Approved Signatory

Specification Name				
Particle Size Distribution (Washed 2.36mm)	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%	**100**		
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%	**93**		
Passing 19.0mm Sieve	%	**89**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**86**		
Passing 9.5mm Sieve	%	**83**		
Passing 6.7mm Sieve	%	**80**		
Passing 4.75mm Sieve	%	**76**		
Passing 2.36mm Sieve	%	**71**		
Passing 1.18mm Sieve	%	**67**		
Passing 0.600mm Sieve	%	**62**		
Passing 0.425mm Sieve	%	**59**		
Passing 0.300mm Sieve	%	**56**		
Passing 0.150mm Sieve	%	**52**		
Passing 0.075mm Sieve	%	**49**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 43,15/06/2026

Report on Material Quality

Client:	Arco Terra Pty Ltd	Report No:	**4**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 2 of 2
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 03/07/2026 to 14/07/2026	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165398	**1/07/2026**	**BH6**	**-**	**1.0m**	**-**

Moisture, Ratios, Coefficients & Indices	Units	**Result**	**Specification Limits**	**Remarks**
Weighted Plasticity Index (WPI)	--	**1300**		Passing 0.425mm * Plasticity Index
Weighted Linear Shrinkage (WLS)	--	**650**		Passing 0.425mm * Linear Shrinkage
Fines Ratio (FR)	--	**0.83**		Passing 0.075mm / Passing 0.425mm
Plasticity	Units	**Result**	**Specification Limits**	**Remarks**
Liquid Limit	%	**47**		Oven Dried & Dry Sieved
Plastic Limit	%	**25**		Oven Dried & Dry Sieved
Plastic Index	%	**22**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**11.0**		Mould length: 250 mm Condition of dry specimen: Cracked/Broken Bar

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Report on Moisture Content, Emerson Class, Soil pH, EC, PASS/AASS and Foreign Material

Client:	Arco Terra Pty Ltd	Report No:	**5**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	14/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 1
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used:	Insitu	Test Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 14/07/2026	Control Line:	-

Sample Number:		**165399**	**165400**	**165401**	**165402**	**-**
Field Sample/Test Date:		2/07/2026	3/07/2026	3/07/2026	1/07/2026	-
Chainage / Location:	(m)	BH2	BH3	BH5	BH6	-
Offset from control line:	(m)	-	-	-	-	-
Level of Test:	(m)	2.5m	1.0m	1.0m	2.5m	-
Test Depth:	(mm)	-	-	-	-	-

Lab Test Date (Moisture):		-	-	-	-	-
Moisture Content:	**(%)**	-	-	-	-	-

Test Water Used:		Distilled	Distilled	Distilled	Distilled	-
Temperature of Water:	(°C)	14	14	14	14	-
Soil Description:		Sandy Clay, Light Brown	Sandy Clay, Brown/Red Mottled	Sandy/Gravel, Grey/White/Brown Mottled	Sandy Gravel, Grey	-
Emerson Class Number:		**CLASS 5**	**CLASS 5**	**CLASS 6**	**CLASS 5**	**-**

Soil Moisture Condition:		-	-	-	-	-
Distilled Water:	**(pH)**	-	-	-	-	-
Soil Suspension Ratio (Soil:Water)		-	-	-	-	-
Test Temperature:	(°C)	-	-	-	-	-
pH Value of Soil-suspension:	**(pH)**	-	-	-	-	-

Electrical Conductivity:	**0**	-	-	-	-	-

Field pH:	**(pH_F)**	-	-	-	-	-
Field pH Oxidised:	**(pH_{FOX})**	-	-	-	-	-
Acid Sulfate Soil Indication:		-	-	-	-	-

Foreign Material - Type III	**(%)**	-	-	-	-	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

AS 1289.1.2.1, Cl 6.7: (1998)Disturbed Soil Sampling - OpenDrive Sampler
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.8.1: (2017)Emerson Class number of a soil

(NATA accreditation does not cover the performance of this service)**

Report Remarks & Endorsement

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 19902

Issued By:
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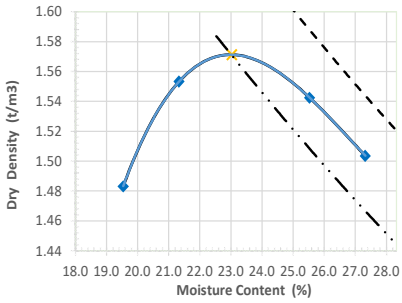
Report on AS CBR and MDD

Client:	Arco Terra Pty Ltd	Report No:	**6**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	16/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 1
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used(Source):	Insitu	Test Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 09/07/2026 to 16/07/2026	Control Line:	-

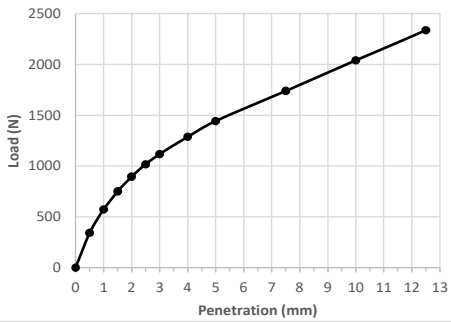
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165334	**9/07/2026**	**BH6**	**-**	**0.7-1.0m**	**300**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	1% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	Low (Less than 35%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 25 hrs	CBR = 50 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.57		Standard compactive effort
Optimum Moisture Content (OMC)	%	23.0		
Field/Prep Moisture Content	%	Field %	Prep 21.8 %	Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 23.3 %	LMR = 101.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.57 t/m3	LDR = 100.0%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.56 t/m3.
Specimen Swell	%	1.0		
Moisture Content - Top 30mm	%	24.8		After Penetration
Moisture Content - Remaining	%	24.4		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

8

The CBR value was determined at a penetration of 2.5mm.
Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

AS 1289.1.2.1, Cl 6.5.4: (1998)Disturbed Soil Sampling - Powered - Pit or trench
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

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Report Remarks & Endorsement

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
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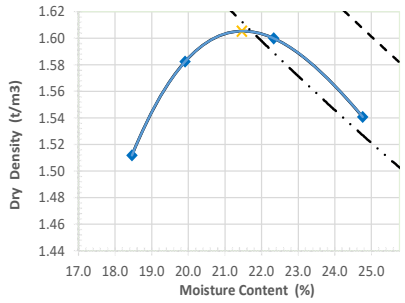
Report on AS CBR and MDD

Client:	Arco Terra Pty Ltd	Report No:	**7**
Client Address:	4 Dabchick Dr, Burleigh Waters QLD 4220	Report Date:	16/07/2026
Project:	381 Wuraga Road, Bahrs Scrub QLD	Report Page:	Page 1 of 1
Works Component:	Geotechnical Investigation	Project No:	2854
Material Used(Source):	Insitu	Test Request/Order:	-
Material Description:	Existing	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 09/07/2026 to 16/07/2026	Control Line:	-

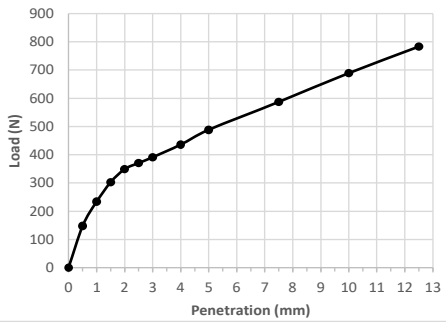
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
165335	**9/07/2026**	**BH5**	**-**	**0.6-0.8m**	**200**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	1% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	Low (Less than 35%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 24 hrs	CBR = 50 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.61		Standard compactive effort
Optimum Moisture Content (OMC)	%	21.5		
Field/Prep Moisture Content	%	Field %	Prep 19.4 %	Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 21 %	LMR = 98.0%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.61 t/m3	LDR = 100.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.58 t/m3.
Specimen Swell	%	2.5		
Moisture Content - Top 30mm	%	24.8		After Penetration
Moisture Content - Remaining	%	23.4		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

3.0

The CBR value was determined at a penetration of 2.5mm.
Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

AS 1289.1.2.1, Cl 6.5.4: (1998)Disturbed Soil Sampling - Powered - Pit or trench
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

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Report Remarks & Endorsement

NATA

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ASCT Document: WB062 - Rev 11, 13/03/2026

Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-186-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH01
Sample Date:	3/07/2026	**Sample Number:**	**52373**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH01**	**BH01**								
Depth (m)	**3.18-3.28m**	**3.18-3.28m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.29	0.13								
Point Load Strength Index (Mpa)	**0.29**	**0.12**								
Descriptive Strength (AS1726, Table 19)	Low	Low								
UCS [AS1726, Table 19] (MPa)	2 to 6	2 to 6								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 20656

Issued By: P.Baltoski
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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-187-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH01
Sample Date:	3/07/2026	**Sample Number:**	**52374**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH01**	**BH01**								
Depth (m)	**4.16-4.25m**	**4.16-4.25m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.16	0.43								
Point Load Strength Index (Mpa)	**0.16**	**0.42**								
Descriptive Strength (AS1726, Table 19)	Low	Medium								
UCS [AS1726, Table 19] (MPa)	2 to 6	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 20656

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-188-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH01
Sample Date:	3/07/2026	**Sample Number:**	**52375**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH01**	**BH01**								
Depth (m)	**5.76-5.86m**	**5.76-5.86m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.20	0.53								
Point Load Strength Index (Mpa)	**0.19**	**0.51**								
Descriptive Strength (AS1726, Table 19)	Low	Medium								
UCS [AS1726, Table 19] (MPa)	2 to 6	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-189-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH01
Sample Date:	3/07/2026	**Sample Number:**	**52376**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH01**	**BH01**								
Depth (m)	**6.62-6.70m**	**6.62-6.70m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.49	0.61								
Point Load Strength Index (Mpa)	**0.48**	**0.57**								
Descriptive Strength (AS1726, Table 19)	Medium	Medium								
UCS [AS1726, Table 19] (MPa)	6 to 20	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 20656

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-190-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH02
Sample Date:	2/07/2026	**Sample Number:**	**52377**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH02**	**BH02**								
Depth (m)	**6.36-6.44m**	**6.36-6.44m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.32	0.88								
Point Load Strength Index (Mpa)	**0.32**	**0.83**								
Descriptive Strength (AS1726, Table 19)	Medium	Medium								
UCS [AS1726, Table 19] (MPa)	6 to 20	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accreditation number: 20656

Issued By: P.Baltoski
Approved Signatory

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ASCT Document: WB062 - Rev 11, 13/03/2026

Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-191-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH02
Sample Date:	2/07/2026	**Sample Number:**	**52378**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH02**	**BH02**								
Depth (m)	**7.88-7.96m**	**7.88-7.96m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.23	0.67								
Point Load Strength Index (Mpa)	**0.22**	**0.70**								
Descriptive Strength (AS1726, Table 19)	Low	Medium								
UCS [AS1726, Table 19] (MPa)	2 to 6	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
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4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-192-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH02
Sample Date:	2/07/2026	**Sample Number:**	**52379**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH02**	**BH02**								
Depth (m)	**9.42-9.81m**	**9.42-9.81m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.82	0.17								
Point Load Strength Index (Mpa)	**0.79**	**0.18**								
Descriptive Strength (AS1726, Table 19)	Medium	Low								
UCS [AS1726, Table 19] (MPa)	6 to 20	2 to 6								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-193-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH02
Sample Date:	2/07/2026	**Sample Number:**	**52380**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH02**	**BH02**								
Depth (m)	**11.25-11.34m**	**11.25-11.34m**								
Lithological Description	Sedimentary	Sedimentary								
Moisture Condition	Moist	Moist								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	0.17	0.30								
Point Load Strength Index (Mpa)	**0.16**	**0.31**								
Descriptive Strength (AS1726, Table 19)	Low	Medium								
UCS [AS1726, Table 19] (MPa)	2 to 6	6 to 20								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

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Report on Rock Core Testing

Client:	ASCT Brisbane South	Report No:	**115-194-Rock Core**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	Geotechnical Testing	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH03
Sample Date:	3/07/2026	**Sample Number:**	**52381**

Point Load Strength Index	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	Specimen 9	Specimen 10
Client ID Number										
Borehole	**BH03**	**BH03**								
Depth (m)	**6.13-6.20m**	**6.13-6.20m**								
Lithological Description	Igneous	Igneous								
Moisture Condition	Dry	Dry								
Test Type	Diametral	Axial								
Anisotropic Direction										
Failure Mode	2	1								
Failure Sketch										
Uncorrected Strength (Mpa)	4.7	5.7								
Point Load Strength Index (Mpa)	**4.5**	**5.8**								
Descriptive Strength (AS1726, Table 19)	Very High	Very High								
UCS [AS1726, Table 19] (MPa)	60 to 200	60 to 200								
Comments										

MEAN VALUE - Point Load Strength Index (Mpa):	**Normal Direction**	-	**Parallel Direction**	-	**Strength Anisotropy Index [Ia(50)] (Mpa)**	-

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. ** **
As Received: Samples stored & Tested in as received condition.
AS4133.4.1: (2007) Determination of Point Load Index

(** NATA accreditation does not cover the performance of this service)

Point Load - Failure Mode Descriptions

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by Joint Plane.
4M	Fracture influenced by Micro-fracture.
4F	Fracture influenced by Foliation.
4V	Fracture influenced by Vein.
5	Invalid Result (Partial fracture, or chip).

Report Endorsement

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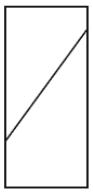
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Report on Uniaxial Compressive Strength (UCS)

Client:	**ASCT Brisbane South**	Report No:	**195**
Client Address:	15-19 Elliott Ct, Hillcrest QLD 4118	Report Date:	17/07/2026
Project:	**Geotechnical Testing**	Report Page:	Page 1 of 1
Works Component:	Arco Yerra Pty Ltd - 381 Wuraga Rd, Bahrs Scrub QLD	Project No:	115
Material Used:	Core	Test Request:	-
Material Description:	-	Lot Number:	-
Lot Comments:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 16/07/2026	Control Line:	BH02
Sample Date:	2/07/2026	**Sample Number:**	**52382**

Uniaxial Compressive Strength

Client ID Number		Failure Mode	(a) Single Shear
Borehole	**BH02**	Failure Sketch	
Depth	**6.44-6.68m**		
Lithological Description	Sedimentary		
Type of Testing Machine	ILLACON02		
Date of Test	16/07/2026		
Height (mm)	106.6		
Diameter (mm)	51.9		
Test Duration (mins)	4.00	Rate Displacement (mm/min)	0.05
UCS (Mpa)	**4.6**	Moisture Content (%)	3.7

Specimen - Before Testing



Specimen - After Testing



Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Client: Results apply to the sample/s as received. **
As Received: Samples stored & Tested in as received condition.
AS4133.4.2.2: (2013) Determination of Uniaxial Compressive Strength (<50MPa)
AS4133.1.1.1: (2005) Determination of moisture content of rock, oven drying.
Length to Diameter Ratio less than 2.5

(NATA accreditation does not cover the performance of this service)**

Report Endorsement

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