Nowra Build to Rent

Geotechnical Investigation Report
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1.0 INTRODUCTION

1.1 **PROJECT DESCRIPTION**

Landcom have engaged Stantec Australia Pty Ltd (Stantec) to undertake a geotechnical investigation for a proposed building site on the corner of Beinda Street and Bolong Road, Bomaderry NSW. The current proposed development comprises two buildings, each with an on-grade, undercroft carpark and between 2 and 3 storeys of residential apartments above the carpark between two (2) and three (3) stories with options for undercroft parking.

This report has been carried out in accordance with Stantec variation proposal 989265 "Additional Geotechnical Testing and Design Support" dated 14th June 2023 [Prop. Ref 989265], and variation 001 "Additional Geotechnical Investigation Nowra BTR" dated 10th January 2024 [VAR001].

Original study area for proposed site is provided in Figure 1-1. The current site development layout has been modified since the initial investigation plan and is presented in Figure 1-2.



Figure 1-1: Site location



Figure 1-2: Current site development layout

1.2 OBJECTIVES

A geotechnical investigation was to be undertaken to access the geotechnical conditions for proposed residential developments for the Build To Rent pilot projects with the following objectives:

- Introduction, overview, and background of the investigation.
- Review of published information regarding the site including site geology, topography, acid sulfate soils and soil landscape maps.
- Site investigation and fieldwork summary
- Investigation results including fieldwork results, borehole plans, in situ tests, subsurface conditions and groundwater conditions.
- Laboratory testing results.
- Recommendation of parameters for permanent retaining walls and shallow foundation design, excavatability and site preparation. Parameters inclusive of the following:
 - Site classification to AS2870.
 - Site sub-soil classification to AS1170.4.
 - Soil density.
 - Friction angle and Earth pressure coefficients.

1.3 **REGIONAL GEOLOGY**

Review of the 1:100,000 Shoalhaven Coastal Quaternary Geology Map indicates that within the tributary west of the site the following alluvial units are present:

- Qavf Quaternary alluvial and colluvial fan: fluvial sand, silt, gravel, clay
- Qhas Holocene backswamp: organic mud, peat, silt clay.
- Qhal Alluvial levee/overbank deposits: fluvially deposited fine to medium grained lithic to quartz rich sand, silt and clay.

Reference to the MinView spatial geology website (NSW Department of Planning, Industry and Environment, 2023) indicates the site is underlain by:

 Pshn – Nowra Sandstone from the parent unit Shoalhaven Group consisting of Fine- to very coarsegrained quartzose sandstone, with a three-fold subdivision: a very coarse-grained base with minor pebbly lenses, a central siltstone zone and a cross-bedded medium-grained quartz sandstone upsequence.

The regional geology plan is presented in Attachement A.

1.4 SITE OBSERVATIONS

A site walkover was carried out on 22nd June 2023 with the following preliminary site observations provided:

- General site location is to the east of a local tributary which flows south and joins Bomaderry Creek.
- From the crest of the site, the slope grades at ~5 degrees towards Belinda Street to the east.
- Rock outcrop comprising highly to moderately weathered sandstone of medium to high strength was observed throughout the site becoming less visible towards Bolong Road to the east.
- Experience locally with the rock unit indicates a more weathered cap of up to 3m of highly to moderately weathered sandstone becoming slightly weathered and high strength (dark grey) with depth. The rock can contain concentrations of fossils.

Selected photos from the site walkover are presented in the Appendix B.

1.5 GEOTECHNICAL SITE CONSTRAINTS

Based on the site walkover, the following geotechnical site constraints were identified prior to the site investigation:

- Shallow bedrock inferred to be covering most of the site comprising highly to moderately weathered sandstone of medium to high strength. In terms of excavatability, based on previous road cutting experience sandstone is likely to require breaking to hard ripping with blasting not expected to be approved given proximity to residential areas.
- Western boundary with banks sloping down to the backswamp with building to consider appropriate set back to satisfy slope stability and any inferred future bank regression.
- Potential fill profile in the southwestern corner of the site.
- Perched water tables on top of horizontally bedded rock and potential for localised peat and hanging swamps.



2.0 GEOTECHNICAL INVESTIGATION

2.1 FIELD INVESTIGATION

2.1.1 Environmental and Heritage

A heritage consultant was engaged by Landcom and undertook a site visit on 25th July 2023 to confirm that site investigation works would not disturb any significant sites.

2.1.2 Service Location

Underground utility location was undertaken on 25th July 2023 and 29th January 2024 by an accredited contractor and comprised clearing of borehole and test pit locations using Cable Avoidance Tool (CAT) prior to drilling commencing. A service location clearance report was presented on-site to Stantec's site representative.

2.1.3 Intrusive Investigation

An intrusive investigation was undertaken from 26th to 28th July 2023, and on 29th January 2024, comprising the following:

- Drilling of three (3) deep boreholes, BH01 to BH03 to retrieve a minimum core length of 10.0m bgl. These boreholes were developed into wells, with 50mm casings and a 3m screen inserted from the base of each borehole.
- Drilling of three (3) additional deep boreholes, BH201 to BH203 to a maximum depth of 6.54m bgl.
- Boreholes were drilled with a track mounted drill rig and solid flight auger techniques. Upon auger refusal, the borehole was advanced using NMLC coring techniques through sandstone rock until target depth was achieved.
- Excavation of six (6) test pits, TP101 to TP106 to a maximum depth of 2.6m upon bucket refusal.
- Dynamic Cone Penetration test (DCP) were conducted at each test pit location prior to excavation.
- The borehole and test pit locations were selected based on the previous site mapping and risk assessment undertaken by Stantec to provide data at the most critical point for assessment of slope remediation.
- Engineering assessment of the subsurface profiles encountered in accordance with AS1726 2017 (Standards Australia Limited, 2017) by a geotechnical engineer from Stantec.
- The test pits were backfilled with material retrieved from excavation and compacted using excavator bucket and returned to existing surface level. Grass was replaced over the surface of the test pits.
- The test pit locations were recorded by a hand-held GPS device with a ±5 m accuracy. The borehole locations were recorded by a licensed surveyor.

A site plan with borehole locations is provided in Appendix A. Engineering logs of the boreholes are presented in Appendix C together with explanatory notes.



2.2 LABORATORY TESTING

Laboratory testing conducted on strategically selected samples recovered during the fieldwork comprised the following:

• Five (5) Uniaxial Compressive Strength (UCS) tests.

Testing was conducted at NATA accredited laboratories, ASCT Illawarra. Laboratory test certificates are included in Appendix D.

3.0 **RESULTS OF INVESTIGATION**

3.1 SUBSURFACE CONDITIONS

Materials encountered in the boreholes were consistent with the geological map. In summary, subsurface conditions encountered in the boreholes are provided Table 3-1 and Table 3-2 below.

Unit	Material Type	Description of Layer
т	TOPSOIL	Sandy SILT; low plasticity, brown, dark brown, fine to coarse sand, with medium rounded to sub-rounded gravel
F	Fill	Silty SAND; fine to coarse grained, brown, low plasticity fines with fine to coarse sub- rounded to sub-angular gravel, trace glass, bricks, plastic, fabric, timber, sand lens, rubber, metal, ceramic.
R	RESIDUAL	Silty SAND; fine to coarse grained, brown, low plasticity fines
S	SANDSTONE ROCK	SANDSTONE; medium to coarse grained, highly weathered to fresh, medium to high strength

	Table 3-1	Summary	/ of	subsurface	units
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Unit	Deep Borehole – Depth mbgl (m)							
Unit	BH01	BH02	BH03	BH201	BH202	BH203		
Unit T	-	0.00	0.00	0.00	0.00	0.00		
Unit F	0.00	-	-	-	-	-		
Unit R	-	-	-	-	-	-		
Unit S	0.50	0.22	0.10	0.10	0.15	0.10		
Termination Depth (mbgl)	11.55	11.93	11.52	6.40	6.54	6.45		
Reason for Termination	Target depth	Target depth	Target depth	Target depth	Target depth	Target depth		

Notes:

mbgl: Meters below ground level



11-14	Shallow boreholes – Depth mbgl (m)							
Unit	TP101	TP102	TP103	TP104	TP105	TP106		
Unit T	-	0.00	0.00	0.00	0.00	0.00		
Unit F	0.00	-	-	0.10	0.10	0.40		
Unit R	2.20	-	-	-	-	-		
Unit S	2.40	0.20	0.25	0.35	0.40	0.70		
Termination Depth (mbgl)	2.40	0.20	0.25	0.35	0.40	0.70		

Table 3-3 Depth to top of Subsurface Units – Test Pits

Notes:

mbgl: Meters below ground level

For details of the subsurface conditions encountered, reference should be made to the engineering logs presented in Appendix C, together with Explanatory Notes.

3.2 CLASSIFICATION OF ROCK

The sedimentary rocks at Nowra which are Permian Age deposits of the Shoalhaven Group largely resemble the sandstones and shales of the Triassic Age Hawkesbury Sandstone and shales.

Consequently, the sedimentary rocks encountered in the project area within Unit 5 have been categorised adopting the classification system documented in (Pells, et al., 1998) which is summarised in Table 3-4 below.

Rock class	Unconfined Compressive Strength (MPa)	Defect spacing (mm)	Allowable seams (%)	Characteristic UCS value for design (MPa)
SANDSTONE CLASS V	>1	-	-	1
SANDSTONE CLASS IV	>2	>60	<10	3
SANDSTONE CLASS III	>7	>200	<5	7
SANDSTONE CLASS II	>12	>600	<3	20
SANDSTONE CLASS I	>24	>600	<1.5	40

Table 3-4: Sandstone classification

Based on review of the borehole logs, the following boundaries between the rock units has been designated which includes three (3) boreholes (BH01, BH02 and BH03.) An equivalent percentage of seams has been adopted to account for the presence of fossil voids within the highly and moderately weathered rock. Corresponding rock class horizons are provided in Table **3-5**.

Unit	Depth at top of rock class (m)								
Onit	BH01	BH02	BH03	BH201	BH202	BH203			
TOP OF UNIT S	0.5	0.22	0.1	0.1	0.15	0.1			
SS CLASS V	0.5	-	0.1	0.1	0.15	0.1			
SS CLASS IV	-	-	-	-	0.6	0.35			
SS CLASS III	0.74	0.22	1.24	0.4	4.74	2.18			
SS CLASS II	3.95	4.39	4.2	4.22	-	-			
SS CLASS I	8.12	9.25	9.5	-	-	-			
Termination RL(m)	11.55	11.93	11.52	6.4	6.54	6.45			

Table 3-5 Depth to top of rock class (m)

3.3 GROUNDWATER OBSERVATIONS

Groundwater was measured in BH01, BH02 and BH03 between 8:00 and 11:00am on 1st August 2023 after well had been purged at least 24 hours earlier. The proximity to Bomaderry Creek which is a tidally influenced body of water may cause the groundwater levels to fluctuate tidally. It should be noted that groundwater levels are also likely to fluctuate with variations in climatic and site conditions.

Ground water was not encountered prior to adopting core drill methods in BH201, BH202 and BH203, and the introduction of drilling fluid precludes identification of standing water levels in these three (3) boreholes. It is also noted that boreholes were immediately backfilled following drilling which precluded longer term monitoring of groundwater levels.

Ground water levels are presented in Table 3-6 below.

Table 3-6 Ground Water depth

Groundwater depth (mbgl)							
BH01	BH02	BH03	BH201	BH202	BH203		
3.20	2.70	7.00	NO	NO	NO		

Notes:

NO: not observed

3.4 LABORATORY TESTING

Selected samples from the boreholes were tested at NATA accredited laboratories for testing. Rock strength testing was undertaken and is summarized in Table 3-7 below. Laboratory test certificates are attached in Appendix E.

Table 3-7 Rock testing

Borehole	Depth (m)	Uniaxial compressive strength (MPa)	Moisture content (%)	Failure Mode
BH01	3.10-3.30	31.0	2.9	Double Shear
BH01	5.10-5.30	54.1	3.8	Double Shear
BH201	0.40-0.70	34.0	2.9	Tensile Dominated
BH202	0.75-1.00	20.0	4.0	Mixed Mode
BH203	1.85-2.00	42.0	3.7	Tensile Dominated

4.0 **RECOMMENDATIONS**

4.1 EARTHQUAKE SITE CLASSIFICATION

Based on the classification system presented in AS 1170.4-2007 "Structural Design Actions Part 4: Earthquake Actions in Australia" and the encountered shallow bedrock, the site is deemed to have the following site subsoil classification:

• Class Ae – Strong Rock. The Hazard Design Factor (Z) of 0.09 is recommended.

4.2 SITE CLASSIFICATION

Based on our experience of the shallow rock in this area, it is recommended that residential slabs and footings are designed in accordance with recommendations in AS2870-2011 for a Class A site provided that footings are founded in the natural ground.

4.3 FOUNDATION DESIGN

4.3.1 Shallow foundations

Allowable and ultimate bearing capacities for mass concrete pad footing are presented in Table 4-1 below.

Rock Class	γ _b (kN/m ³)	Allowable bearing capacity (MPa) ¹	Ultimate bearing capacity (MPa)	Design Young's Modulus (MPa)
SANDSTONE CLASS V	21	0.8	3.5	50
SANDSTONE CLASS IV	22	1.5	5	100
SANDSTONE CLASS III	23	3.5	20	350
SANDSTONE CLASS II	24	5.0	60	900
SANDSTONE CLASS I	24	8.0	120	2000

Table 4-1: Ultimate bearing capacity for rock units

Notes:

1. Bearing pressure to limit settlement to <1% of minimum footing dimension.

Footing construction methods should be "flexible" in that footing excavations can be readily deepened or widened to target more competent materials should lower bearing capacity materials be present. Bearing pressures nominated above are based on footing bases founding a minimum of 0.50m into the founding material.

The nominated bearing pressures assume that all loose, disturbed or softened materials will be removed from footing excavations prior to casting concrete. If the material at the base of the excavation is allowed to wet and soften, it must be over-excavated until competent material is encountered and replaced with lean mix concrete or compacted granular fill. Footing excavation should be inspected by a suitably experienced geotechnical engineer or engineering geologist prior to installing reinforcing and casting concrete to confirm that founding conditions are consistent with the design values.

4.3.2 Deep foundations

Geotechnical design parameters for the encountered rock within the project site have been developed based on the results of in-situ and laboratory testing of selected samples undertaken during previous geotechnical investigations, values documented in the literature (e.g Pells, et al, 1998) for Sydney Sandstone and Shale and previous experience in similar geology. The parameters developed are shown in Table 4-2 and are unfactored and are suitable for use either in limit state or global factor of safety design.

Rock Class	γ₀ (kN/m³)	Ultimate end bearing (MPa)	Allowable bearing capacity (MPa) ¹	Ultimate shaft adhesion in compression (kPa)	Design Young's Modulus (MPa)
SANDSTONE CLASS V	21	3.5	0.8	150	50
SANDSTONE CLASS IV	22	5	1.5	250	100
SANDSTONE CLASS III	23	30	3.5	800	350
SANDSTONE CLASS II	24	60	5.0	1500	900
SANDSTONE CLASS I	24	120	8.0	3000	2000

Table 4-2: Ultimate end bearing/shaft adhesion values for rock units

Notes:

1. Skin friction (fs) and base resistance (fb) as defined in AS2159-2009.

2. Ignore bored pile shaft within 1.5m of ground surface to account for potential site disturbance and moisture change effects

3. Ultimate shaft adhesion based on a clean rock socket with roughness category R2 or better (Pells 1998)

4. Bearing pressure to limit settlement to <1% of minimum footing dimension.

Piles should be designed for both ultimate and serviceability conditions. Ultimate end bearing and shaft adhesion values are to be used with appropriate load factors and geotechnical strength reduction factors to assess ultimate capacity. The rock mass modulus values provided is to be used to calculate settlements to assess serviceability.

The geotechnical strength reduction factor will depend on various influences such as the level of information available for the rock and the level of construction control. Based on the above influence factors applicable for the site and uncertainty with construction method and quality control etc., an average risk rating, ARR and geotechnical strength reduction factor, Φ gb should be calculated. For limit state strength design, a geotechnical strength reduction factor (Φ gb) of 0.45 can be applied to the ultimate capacity presented in. Pile testing requirements will be dependent on AS2159-2009. For piles subject to uplift loads, the



geotechnical strength should be multiplied by a factor of 0.7 in addition to the geotechnical strength reduction factor.

The design values require good construction practices which includes socket cleaning and concreting in a continuous process without delay. It is recommended that an experienced geotechnical engineer or engineering geologist observes pile drilling as well as shaft and mechanical base cleaning to confirm the adequacy of founding strata. Such observations would be undertaken from the piling platform level and would include observation of returned cuttings and drill rig performance, as well as the effectiveness of shaft roughening (if required) and down-hole cleaning.

4.4 **RETAINING WALLS**

Geotechnical parameters to be used for retaining wall design is provided in Table 4-3 below.

Description	γ (kN/m³)	с _и (kPa)	c' (kPa)	¢ (deg)	Active earth pressure coefficient (Ka)	Passive earth pressure coefficient (Kp)	E (MPa)	ν
TOPSOIL	-	-	-	-	-	-	-	-
FILL (Imported Engineered Fill)	20	-	2	32	-	-	35	0.35
RESIDUAL – medium dense (Silty SAND)	19	-	0	30	-	-	25	0.3
SANDSTONE CLASS V	21	-	20	35	0.22	15.73	100	0.3

Table 4-3: Geotechnical Design Parameters for Retaining Wall Design

NOTES:

NE: Not Encountered NA: Not Available c_u :Undrained shear strength c' :Drained shear strength ϕ : Internal Friction Angle γ : Unit Weight

E: Elasticity Modulus

4.5 EROSION

Provision of suitable vegetation protection and adequate drainage would be required as a minimum erosion protection measure. Appropriate surface drainage should be installed to intercept and reduce the velocity of up-slope overland surface flows and to restrict overland surface flows from flowing onto adjacent areas where practical.

All collected stormwater should be appropriately detained in on-site storage or detention basins and discharged in a controlled manner where required. This should be conducted in accordance with the relevant council requirements.

In general, the dispersion potential can be ameliorated by regimented compaction and moisture control during fill placement. A suitable thickness of topsoil (preferably >150 mm) should also be provided to promote vegetation growth for longer-term erosion control.



4.6 EARTHWORKS

4.6.1 Site Preparation

Prior to bulk earthworks, any fill, pavement or structure footings areas shall be cleared of any foreign matter or unsuitable material which includes but is not limited to the following:

- Vegetation or organic matter;
- Topsoil or soil significantly affected by roots or root fibres;
- Any scattered waste or dumped materials;
- Uncontrolled filling which would be subject to further assessment; and
- Loose or low strength (soft) soils or otherwise 'unsuitable' soils.

Given the shallow rock encountered across the site and likelihood for silty organic deposits accumulating in hollows in the horizontally bedded rock, it is recommended that all overburden is removed and the rock is exposed across the site.

Deleterious materials that cannot be reused on site shall be disposed of at a licenced waste facility and classified in accordance with the NSW EPA Waste Classification Guidelines. Stripped topsoils may be stockpiled for re-use where suitable. Topsoil stockpiles shall not exceed 2.5m and the maximum batter shall not exceed 2H:1V. Stockpiles of topsoil should be in accordance with Shoalhaven Development Construction Specifications – C213 Earthworks.

If proposed development extends to areas of uncontrolled fill, the fill should be removed and replaced with engineered fill material. This is due to unknown conditions of fill and potential for instability or differential settlement due to lack of compaction. Appropriate drainage system (sub soil drainage) should also be provided.

4.6.2 Drainage

Prior to earthworks, appropriate site surface drainage and other run off control measures should be implemented to prevent ponding and scouring during the construction, and to minimise the risk of trafficability issues on site clays during and after inclement weather conditions. These measures may include temporary drains, surface grading along with erosion and sediment control and should be appropriately reinstated following the construction.

Care should be exercised in constructing up-slope overland surface flows particularly in times of inclement weather. Depending on the conditions encountered, subsurface drainage may be required at the base of existing gullies or drainage lines prior to filling.

Given the shallow rock encountered across the site, pavements will either require perimeter subsoil drains or drainage rock to prevent saturation of pavement layers around pavements.

4.6.3 Excavation and Trench Stability

Subject to further geotechnical assessment, temporary excavations or trenches in the weathered rock profile would be expected to stand close to vertical in the short-term (i.e. less than construction period). Unsupported short-term excavations or trenches may undergo some local slumping into the excavation in Residual/Alluvial stratum or where seepage occurs. Temporary excavations in the slightly weathered rock profile would stand vertical but care would be required to remove any large rock masses or loose material.

Excavations in the vicinity of existing road embankments or structures should be fully supported in accordance with the design to ensure no inadvertent instability affecting adjacent infrastructure.

Where personnel are to enter excavations, options for short-term excavations include benching or battering back of the excavations to 1 Vertical to 1 Horizontal (1H:1V) within the very stiff or better residual soil and extremely weathered rock profile, or the support of excavations. Short-term excavations within the more competent rock may be battered at steeper than 1V:1H and may not require support, however this would be subject to specific geotechnical assessment. Unsupported excavations should be limited to 1m.

It is recommended that long-term excavations in the soil profile or weathered rock shall be either battered at 1V:3H or flatter and protected against erosion or be supported by engineered and suitably constructed retaining walls.

Seepage or inflow may be encountered during construction and allowance should be made for control such as sump and pump.

4.6.4 Filling

Following site preparation works, fill should be placed and compacted in accordance with the following guidelines and specifications;

- AS 3798-2007 Earthworks for Commercial and Residential Development;
- Shoalhaven Development Construction Specifications C213 Earthworks, dated July 1997.

It is expected that construction of temporary and permanent fill platforms during the bulk earthworks, to support structural loads associated with the commercial development and carpark, would include the following;

- Removal of any existing uncontrolled fill and topsoil or otherwise unsuitable soils from areas where controlled fill is to be placed.
- Locations where controlled fill is not required, e.g. under piled structures or not under any development areas such as the pad sites or carpark may have uncontrolled fill left in place.
- Terracing of the exposed subgrade slope in the area where fill is to be placed if slopes are steeper than 1V:4H at the start of filling level.
- Where rock is not encountered, the exposed subgrade should be scarified and compacted using a heavy vibrating pad foot roller to achieve a dry density ratio of at least 100% Standard compaction



and within \pm 2% of Standard Optimum Moisture Content (SOMC) in accordance with AS1289.5.1.1, 5.4.1 or 5.7.1.

- Any soft or weak areas identified during the subgrade compaction process or proof rolling, that do not respond to further compaction, should be removed and replaced with select fill in layers not exceeding 200mm loose thickness and each layer compacted to achieve a Dry Density Ratio of at least 100% Standard and within ± 2% of SOMC in accordance with AS1289 5.1.1, 5.4.1 or 5.7.1.
- Excavations to remove any soft or weak areas should have side slopes battered not steeper than 2H:1V unless geotechnical assessment is undertaken. Should extensive soft or weak areas be encountered, further geotechnical advice should be sought.
- Engineered fill should be placed in uniform horizontal layers with maximum thickness of 200mm after compaction. Each layer should be compacted to a minimum dry density ratio of 98% Standard Compaction at moisture contents in the order of 60% to 90% of the Optimum Moisture Content beneath pad sides and buildings. Layers beneath pavement areas should be compacted to a minimum dry density ratio of 100% Standard Compaction at ± 2% of SOMC. Over compaction and/or placement of clays significantly dry of OMC should be avoided.
- The top layer of embankment within 200mm of the design subgrade level should be compacted to a minimum dry density ratio of 100% Standard Compaction at moisture contents in the order of 60% to 90% of the Optimum Moisture Content.
- Exposed subgrade and all fill layers should be test-rolled immediately following completion of compaction. If further test polling is required at later date, the surface should be moisture conditions as required, and given not less than four coverages of the testing roller prior to test rolling.

4.7 PAVEMENT DESIGN

4.7.1 Pavement subgrade conditions

Given the shallow sandstone across the site, a subgrade CBR of 15% is recommended for pavement design. It should however be noted that ripping/scratching of the rock surface to ensure adequate drainage and no pooling of water is recommended to increase pavement longevity.

4.7.2 Pavement Thickness Design

Landcom have provided Stantec with a design traffic loading for the internal pavements of the site of 1x10⁵, this value has been utilised for calculation of the thickness for both flexible and rigid pavement designs required for the project. Pavement design has been undertaken in accordance with (Austroads Ltd, 2017) and locally utilised AUS-SPEC standards (AUS-SPEC 0042).

A project reliability of 90% has been assessed for the site design based on AUS-SPEC 0042.

4.7.2.1 Flexible Pavement Design

Based on the design inputs discussed, the recommended pavement thickness design is given in **Table 4-4** below



NOWRA BUILD TO RENT

Location	Minimum Design Subgrade CBR Value (%)	Suggested Pavement Thickness (mm)	Pavement Composition
Internal Pavements	15	270	14/7 double coat spray seal plus primer100mm thickness of CRB20-2 base material.150mm thickness of CRS40 subbase material.

Table 4-4 Flexible Pavement Thickness Design

It is noted that the design thickness proposed is the minimum requirement in accordance with AUS-SPEC 0042.

A 14/7 double spray has been proposed due to the high rainfall average annual rainfall of the region and existing drainage issues at the site. The seal should be in accordance with AUS-SPEC 1143 Sprayed bituminous surfacing.

Pavement material should be placed and compacted in layers not exceeding 200mm compacted thickness. Placement should be in accordance with AUS-SPEC 1112 Earthworks and AUS-SPEC 1141 Pavement Base and Subbase.

Inspection of subgrade following stripping by a suitably qualified geotechnical engineer at the time of construction is recommended to confirm subsurface conditions.

Layer	Minimum Compaction Ratio	Moisture Variation from Optimum Moisture Content
Pavement Material (Base and Subbase)	98% Modified Maximum Dry Density	± 2%
Subgrade	100% Standard Maximum Dry Density	± 2%

Table 4-6 Pavement Compaction Requirements

4.7.2.2 Rigid Pavement Design

It is acknowledged that AUS-SPEC 0042 nominates a 35 year design life for flexible pavements as opposed to a 40 year design life for rigid pavements, it has been assumed that the supplied DESA value of 1×10^5 represents the 35 year period, as such a new N_{DT} (cumulative number of heavy vehicle axle groups) has been back calculated for 40 years based on the following assumptions:

- AADT of 100
- 3% Heavy Vehicles
- ESA/HVAG = 1.039 (in accordance with TLD used for the pavement design)

Based on the back calculation the N_{DT} appropriate for rigid pavement design is 5.8x10⁵. Based on a design subgrade CBR of 15% and a 100mm thick lean-mic concrete subbase, an effective CBR for design of 75% has been assessed. The design has been undertaken for an undowelled plain concrete pavement (PCP. It is noted that lean mix concrete has been selected as (Austroads Ltd, 2017) nominates good performance pairs with plain concrete pavements. Based on a project reliability, a Load Safety Factor of 1.3 has been utilised.

Location	Minimum Design Subgrade CBR Value (%)	Suggested Pavement Thickness (mm)	Pavement Composition
Internal Pavements	15	280	180mm thickness of concrete base 100mm thickness of lean mix concrete subbase.

Table 4-7: Rigid Pavement thickness design

Subbase material (lean-mix concrete) is to be cement bound material with a minimum 28 unconfined compressive strength of 5MPa (blended with fly ash) or 7MPa (without fly ash). Construction of subbase is to me in accordance with AUS-SPEC 1132.

Base concrete is to have a minimum 28-day flexural strength 4.5MPa and a minimum 28-day compressive strength of 32MPa. Slabs are to be maximum 4.3m long with undowelled skewed joints. Construction of concrete base to be in accordance with AUS-SPEC 1133

4.8 EXCAVATABILITY

Fill was observed throughout the site which comprised silty sands and sandy silts, underlain by highly to slightly weathered sandstone.

Targeted rock strength testing of select units within the recovered core has been carried out using the Point Load Strength Index Apparatus. Subsequent data reduction of average rock defect spacing versus point load strength index Is(50), has allowed for these units to be accurately categorised into a Rock Strength and Excavatability Classification. Rock strength and defect spacing has been correlated to a maximum depth of 11.5m below existing ground. The excavatability graph determined by Pettifer and Hookes (1994) is presented in Figure 4-1. The Pettifer and Hookes graph is an empirical determination based on the point load strength and fracture spacings of encountered rock. Typically, the smaller the spacing (more fractures) and the lower the strength, the 'easier' the rock excavation.

The following comments are provided:

• The results of the investigations indicate that excavations and stripping could be readily undertaken in the surficial soil and fill to depths of between 1.4m and 2.00m bgl at the area surrounding BH01 only.



- Hard ripping to breaking bordering on blasting is expected at surface surrounding BH01 to BH03, and BH201 to BH203.
- As controlled blasting/pre-blasting is not likely to be feasible given close proximity to residential areas, alternative options such as cross ripping, hydraulic hammering, rock sawing or grinding methods should be considered. In addition, pre-split holes along the desired basement profile should be considered at approximate 0.5m spacing which should be confirmed by earthworks contractor.

The costs associated with either option should be carefully considered, particularly in relation to the feasibility of establishing such large capacity dozers and the costs associated with the low production rate expected. It is recommended that the earthworks contractor conduct a site-specific assessment including an inspection of the site.



Figure 4-1: Excavatability Assessment (Pettifer & Fookes 1994)

4.9 CONSTRUCTABILITY

The presence of shallow rock on the site is expected to present the following constructability challenges:

- Excavation for a basement level car parking will likely be a time consuming and expensive exercise with potential impact on the community from noise levels.
- Excavation for services will likely be problematic as indicated in the excavatability assessment (section 4.7).
- Pavement profiles will need to carefully detail drainage and may require the use of free draining rock layers prior to placement of pavement layers.



5.0 CLOSURE

We appreciate the opportunity to work collaboratively with you on this project. Our team looks forward to bringing our high level of expertise to deliver successful outcomes in your future projects.

Your attention is drawn to the appended document titled "*Important Information about this Geotechnical Report*" found in Appendix E. This document is intended to clarify to the reader what the realistic expectations of this report should be, and what is the correct use of the document. Misinterpretation of geotechnical information presents significant risk to projects: The document includes a discussion on general limitations of geotechnical services, which by nature, are based extensively on opinion and judgement.

The statements included in this document are not intended to be exculpatory clauses or to reduce the general responsibility accepted by Stantec, but rather to identify where Stantec and our Client's responsibilities lie. The statements ensure that all parties that may rely on the report are aware of their respective responsibilities.

For further enquiries, please do not hesitate to contact Stantec on the information supplied.

6.0 **REFERENCES**

Austroads Ltd, 2017. Guide to Pavement Technology Part 2: Pavement Structural Design. 4th ed. Sydney : Austroads Ltd. Fookes, G. S. P. &. P. G., 1994. A Revision of the Graphical Method for Assessing the Excavatability of Rock. The Geological Society, pp. 145-164. NSW Department of Planning, Industry and Environment, 2023. MinView. [Online] Available at: https://minview.geoscience.nsw.gov.au/ [Accessed 1 February 2023]. NSW Department of Planning, Industry and Environment, 2023. MinView. [Online] Available at: https://minview.geoscience.nsw.gov.au/ [Accessed 1 February 2023]. Pells, P., Mostyn, G. & Walker, B., 1998. Foundations on Sandstone and Shale in the Sydney Region. s.l.:Australian Geomechanics. Shellharbour City Council, 2004. Development Construction Specification - C213, s.l.: SCC. Standards Australia Limited, 2009. AS2159-2009 Piling - Design and Installation, s.l.: s.n. Standards Australia Limited, 2017. AS1726-2017 Geotechnical Site Investigations. s.l.:s.n.

Appendix A SITE PLAN







This document has been prepared based on information provided by others as cited in the data sources. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.



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Appendix B PHOTO REPORT





PHOTO P1 - WESTERN SLOPE BANK SLOPING AT ~20 DEGREES



PHOTO P2 - IRREGULAR HUMMOCKY SURFACE INDICATING PRESENCE OF FILL



Client:	LANDCOM
Project:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
Cardno Reference	304001019
Title:	Photo Report
Size:	A4



PHOTO P3 - WESTERN BOUNDARY LOOKING NORTH WITH ROCK OUTCROP



PHOTO P4 - WESTERN BOUNDARY BANK SLOPING AT ~10 DEGREES



Client:	LANDCOM
Project:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
Cardno Reference	304001019
Title:	Photo Report
Size:	A4



PHOTO P5 - LOOKING WEST TOWARDS SWAMP CROSSING ON BEINDA STREET



PHOTO P6 - LOOKING NORTH WITH ROCK OUTCROP



Client:	LANDCOM
Project:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
Cardno Reference	304001019
Title:	Photo Report
Size:	A4



PHOTO P7 - ROCK OUTCROP ALONG NORTHERN BOUNDARY ADJACENT TO BEINDA STREET ENTRANCE



PHOTO P8 - ROCK FILL FLOATER OF HIGHLY TO MODERATLY WEATHERED SANDSTONE MEDIUM TO HIGH STRENGTH



Client:	LANDCOM
Project:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
Cardno Reference	304001019
Title:	Photo Report
Size:	A4



PHOTO P9 - ALONG INTERNAL BOUNDARY LOOKING EAST TOWARDS BELINDA WITH ROCK OUTCROP



PHOTO P10 - ROCK OUTCROP IN NATURE STRIP ADJACENT TO CORNER INTERSECTION WITH BELINDA STREET



lient:	LANDCOM
roject:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
ardno Reference	304001019
itle:	Photo Report
iize:	A4



PHOTO P11 - LOOKING TOWARDS INTERNAL BOUNDARY FROM BELINDA STREET WITH INFERRED ROCK OUTCROP



Client:	LANDCOM
Project:	NOWRA BUILD TO RENT - GEOTECH INSPECTION
Cardno Reference	304001019
Title:	Photo Report
Size:	A4

Appendix C SUBSURFACE LOGS AND EXPLANATORY NOTES







Explanatory Notes

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. Material descriptions are deduced from field observation or engineering examination, and may be appended or confirmed by in situ or laboratory testing. The information is dependent on the scope of investigation, the extent of sampling and testing, and the inherent variability of the conditions encountered.

Subsurface investigation may be conducted by one or a combination of the following methods.

Method	
Test Pitting: ex	kcavation/trench
BH	Backhoe bucket
EX	Excavator bucket
R	Ripper
Н	Hydraulic Hammer
Х	Existing excavation
Ν	Natural exposure
Manual drilling	: hand operated tools
HA	Hand Auger
Continuous sa	mple drilling
PT	Push tube
PS	Percussion sampling
SON	Sonic drilling
Hammer drillin	ıg
AH	Air hammer
AT	Air track
Spiral flight au	ger drilling
AS	Auger screwing
AD/V	Continuous flight auger: V-bit
AD/T	Continuous spiral flight auger: TC-Bit
HFA	Continuous hollow flight auger
Rotary non-co	re drilling
WB	Washbore drilling
RR	Rock roller
Rotary core dr	illing
PQ	85mm core (wire line core barrel)
HQ	63.5mm core (wire line core barrel)
NMLC	51.94mm core (conventional core barrel)
NQ	47.6mm core (wire line core barrel)
DT	Diatube (concrete coring)

Sampling is conducted to facilitate further assessment of selected materials encountered.

Sampling method		
Soil sampling		
В	Bulk disturbed sample	
D	Disturbed sample	
С	Core sample	
ES	Environmental soil sample	
SPT	Standard Penetration Test sample	
U	Thin wall tube 'undisturbed' sample	
Water sampling		
WS	Environmental water sample	

Field testing may be conducted as a means of assessment of the in situ conditions of materials.

Field testing	
---------------	--

SPT	Standard	Penetration Test
HP/PP	Hand/Pocket Penetrometer	
Dynamic P	enetrome	ters (blows per noted increment)
	DCP	Dynamic Cone Penetrometer
	PSP	Perth Sand Penetrometer
MC	Moisture	Content
VS	Vane She	ear
PBT	Plate Bea	aring Test
IMP	Borehole Impression Test	
PID	Photo Ionization Detector	

If encountered, refusal (R), virtual refusal (VR) or hammer bouncing (HB) of penetrometers may be noted.

The quality of the rock can be assessed by the degree of natural defects/fractures and the following.

Rock quality description		
TCR	Total Core Recovery (%)	
	(length of core recovered divided by the length of core run)	
RQD	Rock Quality Designation (%)	
	(sum of axial lengths of core greater than 100mm long divided by the length of core run)	

Notes on groundwater conditions encountered may include.

Groundwater	
Not Encountered	Excavation is dry in the short term
Not Observed	Water level observation not possible
Seepage	Water seeping into hole
Inflow	Water flowing/flooding into hole

Perched groundwater may result in a misleading indication of the depth to the true water table. Groundwater levels are also likely to fluctuate with variations in climatic and site conditions.

Notes on the stability of excavations may include.

Excavation conditions		
Stable	No obvious/gross short term instability noted	
Spalling	Material falling into excavation (minor/major)	
Unstable	Collapse of the majority, or one or more face of the excavation	



Explanatory Notes: General Soil Description

The methods of description and classification of soils used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, a material is described as a soil if it can be remoulded by hand in its field condition or in water. The dominant component is shown in upper case, with secondary components in lower case. In general descriptions cover: soil type, plasticity or particle size/shape, colour, strength or density, moisture and inclusions.

In general, soil types are classified according to the dominant particle on the basis of the following particle sizes.

Soil Classification		Particle Size (mm)	
CLAY		< 0.002	
SILT		0.002 0.075	
SAND	fine	0.075 to 0.21	
	medium	0.21 to 0.6	
	coarse	0.6 to 2.36	
GRAVEL	fine	2.36 to 6.7	
	medium	6.7 to 19	
	coarse	19 to 63	
COBBLES		63 to 200	
BOULDERS		> 200	

Soil types may be qualified by the presence of minor components on the basis of field examination methods and/or the soil grading.

Terminology	In coarse	In fine soils	
reminology	% fines	% coarse	% coarse
Trace	≤5	≤15	≤15
With	>5, ≤12	>15, ≤30	>15, ≤30

The strength of cohesive soils is classified by engineering assessment or field/lab testing as follows.

Strength	Symbol	Undrained shear strength
Very Soft	VS	≤12kPa
Soft	S	12kPa to ≤25kPa
Firm	F	25kPa to ≤50kPa
Stiff	St	50kPa to ≤100kPa
Very Stiff	VSt	100kPa to ≤200kPa
Hard	Н	>200kPa

Cohesionless soils are classified on the basis of relative density as follows.

Relative Density	Symbol	Density Index	
Very Loose	VL	<15%	
Loose	L	15% to ≤35%	
Medium Dense	MD	35% to ≤65%	
Dense	D	65% to ≤85%	
Very Dense	VD	>85%	

The plasticity of cohesive soils is defined by the Liquid Limit (LL) as follows.

Plasticity	Silt LL	Clay LL
Low plasticity	≤ 35%	≤ 35%
Medium plasticity	N/A	> 35% ≤ 50%
High plasticity	> 50%	> 50%

The moisture condition of soil (*w*) is described by appearance and feel and may be described in relation to the Plastic Limit (PL), Liquid Limit (LL) or Optimum Moisture Content (OMC).

Moisture condition and description		
Dry	Cohesive soils: hard, friable, dry of plastic limit. Granular soils: cohesionless and free-running	
Moist	Cool feel and darkened colour: Cohesive soils can be moulded. Granular soils tend to cohere	
Wet	Cool feel and darkened colour: Cohesive soils usually weakened and free water forms when handling. Granular soils tend to cohere	

The structure of the soil may be described as follows.

Zoning	Description
Layer	Continuous across exposure or sample
Lens	Discontinuous layer (lenticular shape)
Pocket	Irregular inclusion of different material

The structure of soil layers may include: defects such as softened zones, fissures, cracks, joints and root-holes; and coarse grained soils may be described as strongly or weakly cemented.

The soil origin may also be noted if possible to deduce.

Soil origin a	Soil origin and description		
Fill	Anthropogenic deposits or disturbed material		
Topsoil	Zone of soil affected by roots and root fibres		
Peat	Significantly organic soils		
Colluvial	Transported down slopes by gravity/water		
Aeolian	Transported and deposited by wind		
Alluvial	Deposited by rivers		
Estuarine	Deposited in coastal estuaries		
Lacustrine	Deposited in freshwater lakes		
Marine	Deposits in marine environments		
Residual soil	Soil formed by in situ weathering of rock, with no structure/fabric of parent rock evident		
Extremely weathered material	Formed by in situ weathering of geological formations, with the structure/fabric of parent rock intact but with soil strength properties		

The origin of the soil generally cannot be deduced solely on the appearance of the material and the inference may be supplemented by further geological evidence or other field observation. Where there is doubt, the terms 'possibly' or 'probably' may be used



Explanatory Notes: General Rock Description

The methods of description and classification of rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, if a material cannot be remoulded by hand in its field condition or in water, it is described as a rock. In general, descriptions cover: rock type, grain size, structure, colour, degree of weathering, strength, minor components or inclusions, and where applicable, the defect types, shape, roughness and coating/infill.

Rock types are generally described according to the predominant grain or crystal size, and in groups for each rock type as follows.

Rock type	Groups
Sedimentary	Deposited, carbonate (porous or non), volcanic ejection
Igneous	Felsic (much quartz, pale), Intermediate, or mafic (little quartz, dark)
Metamorphic	Foliated or non-foliated
Duricrust	Cementing minerology (iron oxides or hydroxides, silica, calcium carbonate, gypsum)

Reference should be made to AS1726 for details of the rock types and methods of classification.

The classification of rock weathering is described based on definitions in AS1726 and summarised as follows.

Term and symbol		Definition
Residual Soil	RS	Soil developed on rock with the mass structure and substance of the parent rock no longer evident
Extremely weathered	XW	Weathered to such an extent that the rock has 'soil-like' properties. Mass structure and substance still evident
Distinctly weathered	DW	The strength is usually changed and may be highly discoloured. Porosity may be increased by leaching, or decreased due to deposition in pores. May be distinguished into MW (Moderately Weathered) and HW (Highly Weathered).
weathered	SW	Slightly discoloured; little or no change of strength from fresh rock
Fresh Rock	FR	The rock shows no sign of decomposition or staining

The rock material strength can be defined based on the point load index as follows.

Term and symbol		Point Load Index I₅50 (MPa)
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	Μ	0.3 to 1.0
High	Н	1.0 to 3
Very High	VH	3 to 10
Extremely High	EH	> 10

It is important to note that the rock material strength as above is distinct from the rock mass strength which can be significantly weaker due to the effect of defects. A preliminary assessment of rock strength may be made using the field guide detailed in AS1726, and this is conducted in the absence of point load testing.

The defect spacing measured normal to defects of the same set or bedding, is described as follows.

Definition	Defect Spacing (mm)	
Thinly laminated	< 6	
Laminated	6 to 20	
Very thinly bedded	20 to 60	
Thinly bedded	60 to 200	
Medium bedded	200 to 600	
Thickly bedded	600 to 2000	
Very thickly bedded	> 2000	

Terms for describing rock and defects are as follows.

Defect Terms			
Joint	JT	Sheared zone	SZ
Bedding Parting	BP	Seam	SM
Foliation	FL	Vein	VN
Cleavage	CL	Drill Lift	DL
Crushed Seam	CS	Handling Break	HB
Fracture Zone	FZ	Drilling Break	DB

The shape and roughness of defects in the rock mass are described using the following terms.

Planarity		Roughness	
Planar	PR	Very Rough	VR
Curved	CU	Rough	RF
Undulose	UN	Smooth	S
Irregular	IR	Slickensided	SL
Stepped	ST	Polished	POL
Discontinuous	DIS		

The coating or infill associated with defects in the rock mass are described as follows.

Infill and Coating		
Clean	CN	
Stained	SN	
Carbonaceous	Х	
Minerals	MU	Unidentified mineral
	MS	Secondary mineral
	KT	Chlorite
	CA	Calcite
	Fe	Iron Oxide
	Qz	Quartz
Veneer	VNR	Thin or patchy coating
Coating	СТ	Infill up to 1mm


Graphic Symbols Index



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Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYP characteris & mi ROCK NAN colour, inclusions	E, plasticity or parti tic, colour, second nor components IE, grain size and t fabric and texture, & minor componer	cle ary ype, nts	Weathering	Es Si Is ₍ -Axia	timated trength (50) MPa al O-Diametral S ← ∞ ♀ ≥ ェ > ʉ	Ave Nat De Spa (m ≈ ⊗ §	rage ural fect cing m) ⁰⁰ ⁰⁰ ⁰⁰ ⁰⁰	Visual	DEFE shape or coa	Additional Data CT TYPE, orienta e, roughness, infil tting, thickness, o	tion, ing ther	Monitoring Well Details
				9-	- - - - - -		0.74m START CORI SANDSTONE grey with oran	NG AT 0.74m ;, medium to coarse grair ge-brown iron staining	ned, pale	HW						— 1.18 r	m: BP, 5°, IR, RF, CN	-	
	0% Water LOSS	97	97	8-	- - - - - -		1.74m fossil v 1.82m fossil v 2.07m fossil v 2.45m 2.13m fossil v	oid closed oid - 5mm, open oid - 2mm, open oid - 2mm, open								2.17 r CLAY 2.34 r	m: BP, 3°, IR, RF, CT , pale grey n: HB		
	01-23			7 -	- - 3 -	<u> </u>	CORE LOSS SANDSTONE grey with oran	0.05m (2.45-2.50) ;, medium to coarse grair ge-brown iron staining	ned, pale	HW						2.93 r 3.04 r	n: HB n: HB		
	0% Water LOSS8	100	100	6-	- - 4 -		3.54-3.57m fo 3.95m 2.16m fossil v 3.74m fossil v 3.95m Grey	ssil void, 30mm, open oid - 5mm, open oid - 10mm open	/	sw							n: BP n: BP, 3°, IR, RF, CT black n: HB n: DB n: BP, 5°, IR, RF, CN n: HB	-	
				5 -													m: BP, 5°, IR, RF, CN m: BP, 10°, IR, RF, C m: BP, 5°, IR, RF, CN m: BP, 10°, IR, RF, SILT, black	N -	
	% Water LOSS	100	100	3-	- - - - - 7		6.73m void, 1()mm open									n: HB n: BP, 10°, IR, RF, SILT, black m: HB n: BP, 5°, IR, RF, OUT, black, RF,		
	0			2-	- - - 												n: BP, 10°, IR, RF, SILT, black - 8.13 m: SM, 3°, SIL ⁻	- - - -	
	0% Water LOSS	100	100	1 -	+ + + - 9 + - -												n: HB n: BP, 5°, IR, RF, CN n: HB		
	ILLING V So /T So A Ho B R R R R R R R R R R R R R	Golid fligh olid fligh ollow flig /ashbor ock rolk otary cc otary	t auger t auger ght aug e drillin er ore (85 ore (63 ore (51 concret e on sam ling ier	: V-Bit : TC-Bit er g mm) 5mm) 94mm) e coring pling		ATER Water water water OCK QU/ ESCRIPT QD Ro De CR Tor Re	R R late shown VI late shown H er inflow H er outflow L L R IONS FF ck Quality SV signation (%) DD hal Core H covery (%) X	OCK STRENGTH 1 Extremly High High High High Medium Low Dev Very Low OCK WEATHERING R Fresh % Slightly Weathered Moderately Weathered W Moderately Weathered W Highly Weathered W Highly Weathered Extremly Weathered	l ed	DEFEC JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TY Joint Shea Bedd Sean Folia Vein Cleav Crusl Fract Drift I Hand Drillir	PE red zone ling Parting n tion vage hed Seam ure Zone Lift ling Break mg Break	PL CL DI: DI: DI: ST UN RC RF SS SL PC	ANARI J Cun S Disc Irreg R Plar Step J Und DUGHNI Rou Smo Sloc DL Poli	/ ved continu- gular pped ulose ESS / Roug gh coth ckensid shed	luous Ih ded	COATING CN Clean SN Stained VNR Veneer (ti CT Coating (r INFILL MATERIA X Carbonac MU Unidentifi MS Secondar KT Chlorite CA Calcite Fe Iron Oxide Qz Quartz	hin or p ip to 1i _S eus ed min y mine	teral ral

(D	Sta	int	ec											С	ORE L	.OG S	HEET
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Pos	ition	: E28	0876	.982	N6140	040.77	73 56 MGA2020	Angle fi	rom H	orizo	ntal: 9	0°		Su	rface E	levation:	9.981 m	AHD
Rig	Туре іпа Г	e: Ha	njin		8D	Dit '		Mountir Bit Con	ng: Tr	ack	nd .			Dri	iller: TN	/ r: Total	Drilling	
Dat	ing L a Sta	rted:	7-27	-23		Date	Completed: 7-27-23		Bv: A	: god \C	50			Co	ecked I	r: rotar Bv: DR	Drilling	
Dut	Co	ring					Materia	al Description	<u> </u>					De	fect Des	scription		
Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE, plastic characteristic, colo & minor com ROCK NAME, grain colour, fabric ar inclusions & minor	ity or particle ur, secondary ponents size and type, id texture, components	Weathering	Est St Is _{(t} • Axia	timated rength ₅₀₎ MPa		verage atural Defect Dacing (mm)	Visual	A DEFEC shape or coat	Additional [CT TYPE, c , roughnes ing, thickn	Data rientation, s, infilling ess, other	Monitoring Well Details
NMLC	0% Water LOSS	100	100	- - -1- -	- - - - - - - - -		SANDSTONE, medium to grey with orange-brown in	o coarse grained, pale on staining <i>(continued)</i>	SW						10.38	m: BP, 5°, IR m: BP, 5°, IR	RF, CN RF, CN -	
				-2 - -2 - -	- 		TERMINATED AT 11.55 Target depth. Groundwa	m ter standpipe installed									-	
				-3 - - - -4 -	- 13 - - - - - - - 14												-	-
				-5 -5 -	- - 												-	- - - - - -
				-6- - - -	- 16 												-	
				-7- - - -8-	- 17 - - - - 18												-	-
				-9 - -	- - - - - - - -												-	
DR AD AD HF WR PQ HC DT PT PS SO AH	ILLING V So T So A Ho S W Ro Ro Ro LC Ro Di Pu Pe N So Air	blid fligh blid fligh blow flig 'ashbor ock rolk otary cc otary cc otar otar otar otar otar otar otar otar otar otar otar otar otar otar	t auger t auger ght auge e drilling er ore (85i ore (51, oncrete on sam ling er	: V-Bit : TC-Bit er 9 mm) 5mm) 94mm) 94mm) 9 coring pling pling	R D R	ATER Wait on c wat wat OCK QU/ ESCRIPT QD Ro De CR To Re	er Level late shown er onflow er outflow ck Quality signation (%) tal Core tal Core tal Core tal Core tal Core tal Core tal Core tal Core	NGTH by High gh THERING Weathered by Weathered by Weathered Weathered by Weathered by Weathered by Weathered by Weathered by Weathered by Weathered by Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TY Joint Shear Beddi Sear Foliat Vein Cleav Crush Fractu Drift L Handi Drillin	PE red zone ing Parting ion age ned Seam ure Zone ift ing Break g Break		PLANARI CU Cun DIS Disc R Irreg PR Plar ST Step PR Plar ST Step NR Veny RF Rou S Smo SL Sloc POL Politi	Y ved oontinuu ular oped ulose ESS Roug gh ooth kensic shed	ious h Jed	COATING CN Cle SN Sta VNR Vei CT Co: INFILL MA X Cai MU Uni MS See KT Chi CA Cai Fe Iror Qz Qu	an ined heer (thin or ating (up to TERIALS bonaceus dentified mi condary min orite cite o Oxide artz	patchy) 1mm) nteral eral

	TITLE	BORE	HOLE CORE PHOTOGRAPH	
Stantec	PROJECT NUMBER 304001019	TEST DATE 27/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 1 OF 3 0.74-5.00m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDCOM PROJECT: NOWRA BUILD LOCATION: BEINDA STR JOB NUMBER: 30400101	BHID: BH C TO RENT DEPTH 0.7 EET, SOMADEREY CORE TRAY NO Q DATE: 27/:	21 4-5.00m 1 of 3 2/23	LOGGED BY: AC
304001014 LAN NOWEA BUILD TO RI BUO1 27/2/23	Nom by		Start Core 0.74m	
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4.0	2 phase	The	and the second second	

Ctouton	TITLE	BORE	HOLE CORE PHOTOGRAPH vra Build to Rent – BH01	
Stantec	PROJECT NUMBER 304001019	TEST DATE 27/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 2 OF 3 5.00-10.00m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDCOM PROJECT: NOWRA BUIL LOCATION: BEINDA STR JOB NUMBER: 3040010	BH ID: BH O DEPTH: S.O. CORE TRAY NO: DATE: 27/7	n 2 of 3 2/23	OGGED BY: AC
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9.0				

Chambar	TITLE	BORE	HOLE CORE PHOTOGRAPH vra Build to Rent – BH01	
Stantec	PROJECT NUMBER 304001019	TEST DATE 27/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 3 OF 3 10.00-11.55m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDCOM PROJECT: NOWRA BUILT LOCATION: BEILDA STR JOB NUMBER: 3040010	BHID: B DTO RENT DEPTH: IN REET, SOMADEREY DATE: 2	H OI 0.00 - 11.55 Y NO: 30+ 3 7/7/23	LOGGED BY: AC
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		CORPORE S		

	.	<i></i>	11 FU	ec								В	ORE	HOLE LOG	SHEE
Clien Proje	it: ect:	L	and lowr	com a Build t	o Rent								F	lole No:	BH0
Locat	tion	: E		la Street	, Bomaderry		020			Job No: 304001019	00°		f a a	Showeticzy 6.00	eet: 1 of
Rig T	vpe	: Ha	njin	D&B 8D	40000.940 30	WGAZ	020			Mounting: Track	90		Driller:	TM	
Casir	ng D	lame	eter:	N/A						J		(Contra	ctor: Total Drilli	ng
Data	Sta	rted:	7-28	-23	Date Com	pletec	1: 7-2	8-23		Logged By: AC		(Checke	ed By: DR	
Dr	rilling			Samp	ling & Testing		_			N	Material Des	cription			
Method	Resistance	Casing	Water	S	Sample or Field Test	RL (m AHC	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle ch colour, secondary and minor co ROCK TYPE, grain size and typ fabric & texture, strength, wea defects and structure	naracteristic, mponents e, colour, thering,	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observat	ions W
ND	Е	N/A				-	_	لىر غاير غاير غلير غاير غ	ML	0.22m Sandy SILT: low plasticity, brow	n, fine sand	M (<pl)< td=""><td></td><td>TOPSOIL</td><td></td></pl)<>		TOPSOIL	
4						-	-			Continued as Cored Drill Hole					-
							1 2 2 3 3 3 4 5 7 -7 -7 -7								
					DE1:	-3-	-								-
METH EX R HA PT SON AH PS AS AD/V AD/T HFA WB RFA	FUD Exc Rip Hai Pu: Soi Air Pei Soi Soi Hoi Wa Roi to exp	cavator per nd aug sh tube nic dril hamm rcussic ort spir id fligh low flig shbord ck rolle	bucke er er on sam al auge thauge thauge drillin er	pler er er: V-Bit r: TC-Bit ger ug or details of	VENE IRATION VE Very Easy (Ne E Easy F Firm H Hard VH Very Hard (Re WATER WATER Water L Shown water o	o Resistand efusal) _evel on hflow utflow	ce) Date	FIE SP HP DC PSI MC PB IMF PID VS		Standard Penetration Test Hand/Pocket Penetrometer Dynamic Cone Penetrometer Perth Sand Penetrometer Moisture Content Plate Bearing Test Borehole Impression Test Photoionisation Detector Vane Shear; P=Peak, R=Resdual (uncorrected kPa)	SAMPLES B - Built D - Buist ES - Env U - Thir MOISTURE D - Dry M - Dry M M - Mois Wet PL - Plas LL w - Mois Mois	k disturbe urbed sa ironment n wall tub st stic limit id limit sture con	ed sampl mple al sampl e 'undist tent	Soil CON S - S e F - F turbed' St - S VSt - V H - F RELATIVE VL - V L - L MD - N D - C VD - V	Very Soft Soft Very Soft Stiff Very Stiff Aard E DENSITY Very Loose Oose Oense Very Dense

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roje .oca	ct: tion	N: _E	Nowra	a Bui la Str	ld to eet, E	Rent Bomade	erry	Job No:	30 <u>4</u> 0	01019			Sheet:	2 of 3
osit	ion	: E28	1018	.675	N614	0086.94	46 56 MGA2020	Angle fro	om Ho	orizontal: 90)°	Su	rface Elevation: 6.906 m	AHD
lig ı Yasi	<u>'уре</u> ~~ Г	: Ha	njin	D&B	8D	Rit -		Mounting Bit Cond	g: Tra	ack		Dr Co	iller: TM	
)ata	ny - Sta	rted:	פו ני ו. 7-28	-23		Date	Completed: 7-28-23	R Logged	Bv: A	good C		Ch	ecked Bv: DR	
· •••	Cor	ring	-				Mater	ial Description	-,			De	fect Description	
Methoa	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE, plast characteristic, col & minor con ROCK NAME, grai colour, fabric a inclusions & mino	icity or particle our, secondary nponents n size and type, and texture, or components	Weathering	Estimated Strength Is ₍₅₀₎ MPa • Axial o - Diametral	Average Natural Defect Spacing (mm) R & R & R & R & R & R & R & R & R & R &	Visual	Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other	Monitoring Well Detail:
\mathbf{A}^{+}				-			0.22m START CORING AT 0. SANDSTONE, medium	22m to coarse grained, pale	MW					k
	3% Water LOSS	100	95	6	- - - - - - - - - - - - - - - - - - -		grey with orange-brown	iron staining					0.72 m: BP, 0°, IR, RF, CN 0.76 m: BP, 0°, IR, RF, VNR, SILT; black, organics 1.20 m: BP, 3°, IR, RF, SN, Fe 1.44 - 1.45 m: SM, 0°, IR, RF, VNR, CLAY; pale grey 1.81 m: BP, 0°, IR, RF, 1.41 m: BP, 0°, IR, RF,	
-	18-01-281			5 - - - 4	-2		2.49m fossil void, 10mr 2.58m 2 n.o. fossil void 3.10m 3.10m 2.79 fossil void, 3mn, c	n, open J, 5mm open , 10mm, open	sw				VNR, CLAT, pare groy 2.09 m: HB 2.30 - 2.31 m: SM, 0°, IR, RF, VNR, CLAY; pale grey 2.37 - 2.39 m: SM, 0°, IR, RF, FILLED, Sandy CLAY; low plasticity, pale grey, coarse, rounded sand	
	iter LOSS 0	100	95	- - 3 - -	- - - - - - - - - - - - - - - - - - -		2.12 IOSN VOID, CONN, CARL 2.82m fossil void, 5mm, 3.55m grey 3.70m pale grey 3.11m fossil void, 5mm, grey 4.28m grey	, open	MW SW SW					
	0% Wa			- 2			4.35m fossil void, 2mm, grey	, open	SW				 VNR, SILT, black 4.30 m: BP, 3°, IR, RF, CN 4.73 m: BP, 0°, IR, RF, CN 4.73 m: BP, 5°, IR, RF, CN 5.05 m: HB 5.18 - 5.19 m: SM, 3°, IR, RF, VNR, SILT, black 5.36 m: BP, 3°, IR, RF, VNR, SILT, black 	
				- 1= - -	- - - - - - - -								 5.54 m: BP, 5°, IR, RF, VNR, SILT, black 5.67 m: BP, 3°, IR, RF, CT, SAND, medium grained, round 5.70 m: BP, 3°, IR, RF, CT, SAND, medium grained, round round S.88 m: BP, 5°, IR, RF, CN 	
	0% Water LOSS	100	100	- 0 - - -	- - - - - - - - - - - - - - - - - - -								L 6.04 m: BP, 3', IR, RF, CN 6.60 m: BP, 3', IR, RF, CN 6.60 m: BP, 3', IR, RF, CN 6.61 m: BP, 3', IR, RF, CN 6.80 m: BP, 3', IR, RF, CN 7.21 m: BP, 5', IR, RF, VNR, SILT, black 7.49 m: HB	
				-1-	- 8									
	0% Water LOSS	100	100	-2 - - - -3 -	9								9.19 - 9.21 m: SM, 3°, — SAND; grey, fine to medium grained 9.24 m: BP, 3°, IR, RF, CN — 9.86 m: HB	
AD/V AD/T HFA WB RR PQ HQ NML DT PT PS SON AH	LING So Ho Wi Ro Ro C Ro C Di Pu Pu So Ai	blid fligh blid fligh blow flig ashbor ock rolk otary cc otary cc otary cc atube c ush tube ercussic pnic dril r hamm	t auger t auger ght auge er ore (85r ore (63. ore (51. concrete on sam ling ler	: V-Bit : TC-Bit er g mm) 5mm) 94mm) e coring pling	R D R	VATER Wate on c wate wate CCK QUA CCK QUA CCR Tol Re	ter Level EH Extrem late shown er inflow H High er inflow H High er outflow L Low VL Very I ALITY ROCK WE IONS FR Fresh ck Quality signation (%) MW Mode tal Core HW High) X W Strete	RENGTH mly High High Low ATHERING 1 Weathered toty Weathered rately Weathered rately Weathered rately Weathered	DEFEC JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TYPE Joint Sheared zone Bedding Parting Seam Foliation Vein Cleavage Crushed Seam Fracture Zone Drift Lift Handing Break Drilling Break	CU CUN DIS Disc IR Irreg PR Plar ST Step UN Und ROUGHNI VR Very RF Rou S Smo SL Sloc	Y ved continu ular ar ulose ESS Roug gh coth ckensid	bous COATING CN Clean SN Stained VNR Veneer (thin or CT Coating (up to INFILL MATERIALS X Carbonaceus MU Unidentified mi MS Secondary min KT Chlorite CA Calcite ded Fe Iron Oxide	patchy) 1mm) nteral eral

	N	Sta	int	ec													CC	ORE	LOG	SHE	ΕT
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Loc	atior	n: E	Beind	la Str	eet, B	omade	erry		Job No:	3040	010	19							Shee	t: 3	of 3
Pos	ition	: E28	1018 niin	.675	N6140	086.94	6 56 MGA	2020	Angle fi Mountir	rom He	oriz	ontal: 9	0°			Su	rface El	evatior	n: 6.906	m AF	ID
Cas	ing [Diam	eter:	N/A	50	Bit	Type: impr	eg	Bit Con	dition:	: go	od				Co	ntractor	: Tota	I Drilling	J	
Data	a Sta	rted:	7-28	-23	i	Date	e Complete	d: 7-28-23	Logged	By: A	AC					Ch	ecked B	y: DR			
	Co	ring		Ô				Material De	scription		-					Det	fect Des	cription		_	o slin
Method	Fluid	TCR (%)	RQD (%)	RL (m AHI	Depth (m	Graphic Log	SOIL charac ROCK col inclus	I YPE, plasticity or steristic, colour, se & minor componer NAME, grain size lour, fabric and tex ions & minor com	r particle econdary nts and type, xture, ponents	Weathering	VL 0.1 ⊕ SG SG SG SG SG	Stimated Strength (50) MPa ial O-Diametra \tilde{c} \tilde{c} \tilde{c} \tilde{c} \tilde{c} \tilde{c} \tilde{c} \tilde{c}	20 -	Average Natural Defect Spacing (mm) 8 8 8	2000	Visual	A DEFEC shape, or coati	dditional T TYPE, roughne ng, thick	Data orientatior ess, infilling ness, othe	n, J	Well Deta
■ NMLC	0% Water LOSS	100	100	-4 -4 - - 	- 11 		SANDS1 grey with 11.93m TERMIN Target d	TONE, medium to coar orange-brown iron sta ATED AT 11.93 m epth. Groundwater sta	se grained, pale ining (continued) ndpipe installed	SW							— 10.05 m 10.40 m — 11.17 m — 11.32 m	:: HB :: BP, 3°, I :: HB :: HB	R, RF, CN		
				6 7 	- - - - - - - - - - - - - - - - - - -																
				8 - - -9 - - - -	- 15 																
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AD AD HF. WE RR PQ HQ HQ DT PT PS SO AH	ILLING // So // So A Hi B Ri R Ri Ri Ri Ri Ri Ri Ri Ri Ri Ri Ri R	bild fligh bild fligh bild fligh billow flig 'ashbor ock rolk otary cc otary cc otar	t auger t auger ght auge e drilling er ore (85i ore (63. ore (51. oncrete on sam ling er	: V-Bit : TC-Bit er g mm) 5mm) 94mm) e coring pling or details	R T O of	ATER Wate wate CR CK QU/ ESCRIPT QD Ro De CR Tol Re	er Level late shown er inflow er outflow ALITY IONS ck Quality signation (%) ial Core covery (%)	ROCK STRENGTH EH Extremly High VH Very High M Medium L Low VL Very Low ROCK WEATHER FR Fresh SW Silghtly Weati DW Distinctly We MW Moderately W HW Highly Weati XW Extremly Wea	H ING hered athered /eathered ered athered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT T Join Shea Bedd Seau Folia Vein Clea Crus Frac Drift Han	YPE t ared zone ding Partir m ation wage whed Seam ture Zone Lift ding Break ng Break	g	PLANA CU CU DIS CU IR II PR F ST S UN L ROUG VR \ RF F S SL S POL F	ARITY Curved Discorregul Planar Steppo Jnduk HNES Very F Smoot Shock Polish	d ar ed ose S Rough th ensid ed	ous h led	COATINC CN C SN S VNR V CT C INFILL M X C MU U MS S KT C CA C Fe Irr Qz Q	G lean tained eneer (thin oating (up t ATERIALS arbonaceus nidentified econdary m hlorite alcite on Oxide uartz	or patc o 1mm mintera	hy) i) al

Ctonton	TITLE	BOF	EHOLE CORE PHOTOGRAPH owra Build to Rent – BH02	
y Stantec	PROJECT NUMBER	TEST DATE	INCLINATION:	CORE LENGTH: BOX 1 OF 3
	DRILL RIG: Haniin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY:	CHECKED BY: DR
Stante	C CLIENT NAME: LAN PROJECT: NOW RA LOCATION: BEIND JOB NUMBER: 304	BUILD TO REMT DE A STREET, BOMADEREY CO GOIDIQ DA	HID: BHOZ SPTH: DRE TRAY NO: 1 of 3 HTE: 28/7/23	LOGGED BY: AC
304001019 LAND COM 28 NOWRA BUILD START CORE	///23 0.22m		Second second second	F Sille
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20	and the first free	1.	AN ANTAL	VA
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Ctonton		Nov	wra Build to Rent – BH02	
Stantec	PROJECT NUMBER 304001019	TEST DATE 28/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 2 OF 3 5.00-10.00m
	DRILL RIG:	CONTRACTOR:	LOGGED BY:	CHECKED BY:
Stantec	CLIENT NAME: LANDO PROJECT: NOW RAB LOCATION: BEINDA JOB NUMBER: 30400	STREET, BOMADEREY CORE TRAD	102 .0-10.0 MO: 2 of 3 2/7/23	LOGGED BY: AC
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5.0				
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Contraction	TITLE	BOREHOLE CC Nowra Build	DRE PHOTOGRAPH l to Rent – BH02	
Stantec	PROJECT NUMBER 304001019	TEST DATE 28/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 3 OF 3 10.00-11.93m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDCOM PROJECT: NOWRA BUILD TO LOCATION: BEINDA STREE JOB NUMBER: 304001019	BH ID: BHO2 DEPTH: 10.0-11.9 T, BOMADERRY CORE TRAY NO: 3 OF DATE: 28/7/23		BY: AC
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11.0	£	al	Ser Ser Ser	EVD COR 11.93m
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Loc	ation	n: l	Beind	la Street	, Bomaderry					Job No: 304001019					Sheet:	1 of 3
Pos	Type	1: E28	30932 miin	.632 N61	40104.558 56	MGA	2020			Angle from Horizontal: Mounting: Track	90°		Surfac	· TM	on: 10.616 n	1 AHD
Cas	sina l	Diam	eter:	HW						Mounting. Track			Contra	ctor: To	tal Drilling	
Dat	a Sta	arted	7-27	'-23	Date Corr	plete	d: 7-2	27-23		Logged By: AC		(Check	ed By: D	R	
	Drillin	g		Samp	ling & Testing						Material Des	cription				
Method	Resistance	Casing	Water	S	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle colour, secondary and minor c ROCK TYPE, grain size and ty fabric & texture, strength, we defects and structure	characteristic, omponents /pe, colour, eathering, e	Moisture Condition	Consistency Relative Density	ST & Othe	RUCTURE er Observations	Monitoring Well Details
2 4	E			ES 0.10 m				نى غاند غاند • • • • • • •	ML	0.10m Sandy SILT: low plasticity, bro	wn, fine to	_M (<pl)< td=""><td>-</td><td>TOPSOIL</td><td></td><td></td></pl)<>	-	TOPSOIL		
- RR — A	ИН	HW				10-	-		GW	SANDSTONE, RECOVERED GRAVEL: coarse, pale orang) AS SANDY e / pale grey			RUCK		
	F						-1			1.24m						
							-			Continued as Cored Drill Hole)					-
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ME	 Ethod)			PENETRATION	1		FIE		STS	SAMPLES				SOIL CONSISTE	NCY
EX R HA	(E) Ri	cavato pper and au	r bucke ger	ət	VE Very Easy (N E Easy F Firm	o Resistar	ice)	SP HP	T - -	Standard Penetration Test Hand/Pocket Penetrometer	B - Bull D - Dist ES - Env	k disturb turbed sa /ironment	ed samp ample tal samp	le le	VS - Very So S - Soft F - Firm	oft
PT SC	PL DN Sc	ush tub onic dri r hamm	e Iling ner		H Hard VH Very Hard (R	efusal)		PSI MC	P -	Perth Sand Penetrometer Moisture Content	U - Thir	n wall tut	be 'undis	turbed'	St - Stiff VSt - Very St H - Hard	iff
PS AS	S Pe	ercussion ort spi	on sam	pler er	WATER	Level on	Date	PB	Т- У-	Plate Bearing Test Borehole Impression Test	D - Dry M - Moi	st				SITY
AD AD HF	0/V So 0/T So FA Ho	olid flig blid flig bllow fli	nt auge ht auge ight au	er: V-Bit er: TC-Bit ger	shown	nflow		PID	-	Photoionisation Detector Vane Shear; P=Peak,	W - Wei PL - Pla	t stic limit			VL - Very Lo L - Loose MD - Medium	n Dense
WE RF	B W R⊂Ro	ashbor ock roll	e drillir er	ng	water o	utflow				R=Resdual (uncorrected kPa)	w - Moi	sture cor	ntent		D - Dense VD - Very De	ense
Ref abb	fer to ex previation	planator ns and b	y notes f asis of d	or details of escriptions			S	Stant	ec	Australia PTY LTD)					

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Pos	ition	: E28	0932	.632 N	16140	0104.5	58 56 MGA20)20	JOD NO: Angle fr	3040	orizontal: 9	0°	Su	rface E	levation:	5neet: 10.616	∠ or ₃ m AHD
Rig	Type	e: Ha	njin	D&B 8	D				Mountir	ig: Tra	ack	•	Dr	iller: Tl	M	101010	
Cas	ing [Diam	eter:	HW		Bit	Type: impre	g	Bit Con	dition:	good		Co	ontracto	or: Total D	rilling	
Dat	a Sta	rted:	7-27	-23		Dat	e Completed	7-27-23	Logged	By: A	C		Ch	ecked	By: DR	-	
	Co	ring						Material Desc	ription				De	efect De	scription		_ 0
Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL T characte & ROCK N colo inclusio	YPE, plasticity or p eristic, colour, seco minor components AME, grain size ar ur, fabric and textu ns & minor compo	article ondary s nd type, ire, onents	Weathering	Estimated Strength Is ₍₅₀₎ MPa • Axial O-Diametral	Average Natural Defect Spacing (mm) ର ଛ ର୍ ତ୍ରି ତ୍ରି	Visual	DEFE shape or coa	Additional Da CT TYPE, ori e, roughness, ting, thicknes	ta entation, infilling ss, other	Monitoring Well Detail
	0% Water LOSS	88	68		- - - - - - - - - - - - - 2 -		1.24m START CC 1.38m CORE LO SANDSTC grey with o 2.38m foss	DRING AT 1.24m SS 0.14m (1.24-1.38) INE, medium to coarse range-brown iron stainii sil; void closed	grained, pale ng	HW					n: JT, 45°, IR, R 1.51 m: SM, D, SILT, black v ics n: BP, 3°, IR, Ri n: BP, 3°, IR, Ri n: BP, 3°, IR, Ri n: BP, 3°, IR, Ri	- F, CN vith -, C -, C -, C -, C	
	0% Water LOSS	100	96	8 7 6 	- - - - - - - - - - - - - - - - - - -		2.47-2.56r 2.56m Fos 3.14m 2.80-2.81r 3.50m pale grey 3.50m pale grey 3.38m Fos 3.45-3.48r grey 4.19 Fossi	n voided fossil zone, 5% sil; void - 10mm, open n Fossil; void - 10mm, o sil; void - 5mm, open n fossil; void, 30mm l; void - 10mm, open	6 Voids 	SW MW SW					n: BP, 10°, IR, F n: BP, 15°, IR, F 3.43 m: SM, 3° D, SILT, black n: BP, 10°, IR, F n: BP, 10°, IR, F n: BP, 3°, IR, RI SILT, black n: BP, 10°, IR, F	RF, C - RF, C - RF, C - RF, C - RF, C - RF, C -	
	08-0%20%	. 100	100	5 4 	- 		5.37m foss	sil; void closed							n: HB 6.90 m: SM, 0° n: HB 7.34 m: SM, 0° n: BP, 0°, IR, RI n: HB n: HB n: HB	-, C - , SILT, , SILT, - , C - -, C -	
	0% Water LOSS	100	97	2 1 	- - 9 - - -									8.59 r 8.71 r 8.75 r 8.73 r 9.13 r 9.52 r	n: BP, 3°, IR, RJ n: BP, 3°, IR, RJ n: BP, 5°, IR, RJ n: BP, 0°, IR, RJ n: BP, 3°, IR, RJ n: HB		
AD AD HF PG HG NM DT PS SCH Rei	ILLING /V So /T So A Ho B R R R R R R R R R R R R R	bid fligh oldor fligh ollow fligh ollow fligh ollow fligh olary co otary co otar otar otar otar otar otar otar ota	t auger t auger ght aug e drillin ore (850 ore (51. concrete on sam ling er	: V-Bit : TC-Bit er g mm) 5mm) 94mm) e coring pling or details o	R Tr	ATER Wa on o wat wat OCK QU, ESCRIPT QD Ro De CR To Re	ter Level date shown er inflow er outflow ALITY TONS wck Quality signation (%) tal Core ccovery (%)	ROCK STRENGTH EH Extremly High VH Very High M Medium L Low VL Very Low ROCK WEATHERING FR Fresh SW Slightly Weather DW Distinctly Weath MW Moderately Weath Highly Weathere XW Extremly Weath	G ed ered thered ed ered	DEFEC JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TYPE Joint Sheared zone Bedding Parting Seam Foliation Vein Cleavage Crushed Seam Fracture Zone Drift Lift Handing Break Drilling Break	PLANARI CU Cur DIS Disc IR Irreç PR Plat ST Stej UN Und ROUGHNI VR Ven RF Rou S Sm SL Sloc POL Poli	ry ved continu jular bar opped ulose ESS / Roug gh ooth ckensi shed	ious Ih ded	COATING CN Clear SN Stain VNR Vene CT Coat INFILL MATI X Carb MU Unid MS Seco KT Chlo CA Calci Fe Iron (Qz Quar	n ed (thin or ng (up to ERIALS onaceus entified min ndary min ite te Dxide Iz	patchy) 1mm) nteral eral

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ition	n: E	Beind	da Str	eet, E	Somade	erry	Job No:	3040	0101	9				<u> </u>		Sheet:	3 of	3
tion:	: E28	0932 niin	2.632	N6140	0104.5	58 56 MGA2020	Angle fr	om Ho at Tr	orizo	ntal: §	00°		SI	urface E	levation:	10.616 ו	n AHI)
na F	лат. Diam	eter:	HW	00	Bit	Type: impreg	Bit Conc	g. m lition		hd			C	ontracto	r Total	Drilling		
Sta	rted:	7-27	7-23		Date	e Completed: 7-27-23	Logged	By: A	.C	-u			C	necked I	By: DR	<u></u>		
Cor	ring					Materia	al Description						De	efect Des	scription			
Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE, plastic characteristic, colo & minor com ROCK NAME, grain colour, fabric ar inclusions & minor	ity or particle ur, secondary oonents size and type, nd texture, components	Weathering	Est Str Is ₍₅ • Axial	imated rength ₀₎ MPa O-Diametr	20 E	Average Natural Defect Spacing (mm) & & & &	Visual	DEFEC shape or coat	Additional D CT TYPE, o , roughnes: ting, thickne	eata rientation, s, infilling ess, other	Monitoring	ערקוו בסימויג
0% Water LOSS	100	97		- 		SANDSTONE, medium to grey with orange-brown in 11.52m	o coarse grained, pale on staining (continued)	SW						- 10.02 - 10.70 - 10.93	m: HB m: HB m: HB			
						TERMINATED AT 11.52 Target depth. Groundwa	m ter standpipe installed											
LLING / So F So Ro Ro Ro C Ro Dia Pu Pe I So Air	blid fligh blid fligh blid fligh blow flig ashbor ock rolk otary co otary co otary co atube c ush tube ercussio pric dril r hamm	t auger auger ght auger e drillin er ore (85 ore (63 ore (51 concret e on sam ling her	r: V-Bit r: TC-Bit er g mm) .5mm) .94mm) e coring apling	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	ATER Wa on o wat ock QU/ ESCRIPT QD Rc De CR To Re	ter Level EH Extrem VH Very Hi date shown er inflow H High M Mediun er outflow L Low VL Very Lo ALITY ROCK WEA TONS FR Fresh SW Slightly usignation (%) W Slightly signation (%) XW Extrem	ENGTH by High gh n w THERING Weathered by Weathered Weathered Weathered by Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TYF Joint Shear Beddin Seam Foliati Vein Cleava Crush Fractu Drift L Handi Drilling	ed zone ng Partir on age ed Sean rre Zone ift ng Break g Break	ng n	PLANAI CU C DIS D IR Im PR PI ST SU UN U ROUGH VR V. RF R S S SL SI POL P	RITY Jurved scontin egular anar epped ndulose NESS ery Rou- bugh mooth ockens blished	uous gh	COATING CN Cle SN Sta VNR Ver CT Coa INFILL MA X Car MU Uni MS Sec KT Chi CA Cal Fe Iron Qz Qua	an ned eer (thin or titing (up to 1 TERIALS bonaceus dentified min ondary min orite cite Oxide artz	patchy) mm) nteral eral	
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Sonic drilling Sonic drilling Soni	INC Solid flight auger: V-Bit Solid flight auger: TC-Bit Hollow flight auger: TC-Bit Hollow flight auger: TC-Bit Hollow flight auger Washbore drilling Rock roller Rotary core (85.5mm) Rotary core (51.94mm) Diatube concrete coring Push tube Percussion sampling Sonic drilling Air hammer De explanatory notes for details of atoms and basis of descriptions	ING -6 -17 -7 -18 -8 -19 -9 -19 -9 -19 -9 -10 Solid flight auger: V-Bit Solid flight auger: V-Bit Nollow flight auger: TC-Bit Hollow flight auger: TC-Bit Hollow flight auger: Water Level on date shown ROCK STRE Solid flight auger: V-Bit Nollow flight auger: Water Level on date shown H Extrem VH Very Hi High Water outflow Rock roler Washbore drilling Rock roler Percussion sampling Sonic drilling Air hammer ROCK Quality Designation (%) TCR Total Core Recovery (%) ROCK WEA FR Fresh SW Slighty WW Moder HW Highly XW Extrem	INC -6- -17 -17 -7- -18 -18 -8- -19 -19 -9- -19 -9- -19 -9- -19 -9- -19 -9- -19 -9- -19 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	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE, plastic characteristic, colo & minor com ROCK NAME, grain colour, fabric ar inclusions & minor	ity or particle ur, secondary ponents size and type, id texture, components	Weathering	Estima Streng Is ₍₅₀₎ № •-Axial 0-1 5 8 - ⊃ ⊐ Σ ⊥	ated gth IPa Diametral	Average Natural Defect Spacing (mm) g	Visual	/ DEFEC shape or coat	Additional Data CT TYPE, orienta , roughness, infil ting, thickness, o	tion, ling ther	Monitoring Well Detail
	0% Water LOSS	97	97		- - 		0.74m START CORING AT 0.7 SANDSTONE, medium 1 grey with orange-brown 1.74m fossil void closed 1.82m fossil void - 5mm,	4m o coarse grained, pale iron staining open	HW					1.18 m	1: BP, 5°, IR, RF, CM		
	SS®8/01/231				- - - 3 - -		2.07m fossil void - 2mm, 2.45m 2.13m fossil void - 2mm, CORE LOSS 0.05m (2.4 SANDSTONE, medium 1 grey with orange-brown 3.54-3.57m fossil void, 3	open open 5-2.50) o coarse grained, pale iron staining 0mm, open	HW					2.93 m 2.93 m 2.93 m 3.04 m 3.69 m	n: DF, 3, IN, NF, 61 pale grey n: HB n: HB n: HB	,	
	0% Water L	100	100		4 5 		<u>3.95m</u> 3.74m fossil void - 10mn 3.95m Grey	open	SW					3.95 m SILT, I 4.04 m 4.26 m 4.50 m 4.50 m 4.92 m 5.28 m 5.45 m 5.45 m	11: BP, 3°, IR, RF, C1 black 11: HB 11: BB, 5°, IR, RF, CM 11: HB 11: BP, 5°, IR, RF, CM 11: BP, 10°, IR, RF, CM 11: BP, 5°, IR, RF, CM 11: BP, 5°, IR, RF, CM	, , , , , , , , , , , , , , , , , , ,	
	0% Water LOSS	100	100		- - - - - - - - - - - - - - - - -		6.73m void, 10mm open							VNR, \$	SILT, black 1: HB 1: BP, 10°, IR, RF, SILT, black 1: BP, 5°, IR, RF, SILT, black 1: BP, 10°, IR, RF, SILT, black 8.13 m: SM, 3°,		
	0% Water LOSS	100	100		- - - 9 - -									SILT, I 8.90 m 9.06 m 9.44 m	1: HB 1: BP, 5°, IR, RF, CM 1: HB		
DRI AD/ AD/ HF/ WBRPQ QNMI DT PSOI AH	ILLING V So T So A Ho Ro Ro Ro LC Ro Di Pe N So Ai	blid flig blid flig blow fli ashbor bock roll botary co btary co c	nt auge nt auge ght auge e drillir er ore (850 ore (850 ore (510 concret e on sam lling ner	er: V-Bit r: TC-B ger ng .5mm) .5mm) .94mm) e coring pling	Bit - Bit - P 9 R T	ATER Water water CRCRD RCRD Water CRCRD CR	ROCK STRE ter Level EH Extrem late shown VH Very H er inflow H High m model Low vL Very Lo Very Lo ALITY ROCK WEA FR TONS FR Fresh signation (%) SW Signation (%) tal Core HW Highly XW Extrem	INGTH Iy High Igh n W THERING Weathered ty Weathered ty Weathered Weathered Weathered Iy Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TYPE Joint Sheared z Bedding P Seam Foliation Vein Cleavage Crushed S Fracture Z Drift Lift Handing E Drilling Bra	zone Parting Seam Zone Break eak	PLANAR CU Cu DIS Dis IR IR PR ST St UN Un RFR VR RF SS SI SL SI SI	ITY rved continu gular nar pped dulose IESS ry Roug ugh looth ckensid ished	bus h ed	COATING CN Clean SN Stained VNR Veneer (th CT Coating (u INFILL MATERIA X Carbonac MU Unidentifi MS Secondar, KT Chlorite CA Calcite Fe Iron Oxide Qz Quartz	in or pa p to 1m LS eus d minte / minera	itchy) m) ral

(N	Sta	int	ec											С	ORE L	OG S	HEE
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osi	tion	: E28	0880	.000	N6140	040.00	0 56 MGA2020	Angle fro	om He	orizo	ontal: 9)°		Su	rface E	levation:		
Rig	Туре	Ha	njin		8D	D:4 -	F	Mounting	g: Tr	ack	l			Dr	iller: TN	A 		
as	ng L	Jiame	eter:	HVV		Bit	Type: Impreg	Bit Cond	lition:	goo	ba				ontracto		Jrilling	
Jala	i Sia	rtea:	2//0	1123	1	Date	e completed: 2//0//23	Logged	Бу: А	40								1
	Co	ring T	-	â			Material	Description		-				De		scription		bi
Method	Fluid	TCR (%)	RQD (%)	RL (m AHI	Depth (m	Graphic Log	SOIL 1YPE, plastic characteristic, colou & minor comp ROCK NAME, grain colour, fabric and inclusions & minor of	ty or particle r, secondary onents size and type, d texture, components	Weathering	ES St اs () • - Axia د ا ا	timated trength ₅₀₎ MPa al O-Diametra 3 ← ∞ ♀ ♀ म ┝ ਜ਼	AV Na Di Sp (r 00 00	erage atural efect acing nm) $\stackrel{\circ}{\scriptstyle \otimes}$ $\stackrel{\circ}{\scriptstyle \otimes}$	Visual	DEFE shape or coa	Additional D CT TYPE, o , roughnes ting, thickne	oata rientation, s, infilling ess, other	Monitorir Well Dets
	0% Water LOSS	100	100		- - - 11 -		SANDSTONE, medium to grey with orange-brown ir (continued)	o coarse grained, pale on staining	SW						10.38 10.90	m: BP, 5°, IR m: BP, 5°, IR	, RF, CN , RF, CN	
					- - 12 -		TERMINATED AT 11.55 I Target depth. Groundwa	m ter standpipe installed										
					- - 13 -													-
					- 14 - -													-
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JRI AD/ AD/ HF/ NBR AD/ HRR AD/ HRR AD/ HRR AD/ HRR AD/ AD/ HRR AD/ AD/ HRR AD/ AD/ AD/ AD/ AD/ AD/ AD/ AD/	LLING V So A Ho Ro Ro C Ro Di Po Ai	J blid fligt ollow fli ashbor ock rolli otary co otary co	nt auge ght auge ght auge ght auge ght auge er (85 ore (63 ore (51 concret e on sam lling her	I er: V-Bit ger 1g mm) .5mm) .94mm) e coring apling	iit T	ATER Wate on c wate ock QU ESCRIPT QD Ro De CR To Re	L ROCK STRE er Level late shown er inflow er outflow routflow ALITY IONS ck Quality signation (%) tal Core tal Core tal Core tal Core H Extremity K Very Hig M Medium L Low VL Very Lov VL Very Lov SW Slightly DW Distinct MW Moderat HW Highly V XW Extremity	NGTH / High jh Wethered y Weathered ely Weathered ely Weathered Veathered / Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TY Joint Sheat Beddi Seam Foliat Vein Cleav Crush Fractu Drift L Hand Drillin	red zone ing Parting n ion vage ned Seam ure Zone ift ing Break g Break	I ! ! P C C C III III F S C U F S S S F	I I ILANARI CU Cunnolls Disc Disc R Irreg R Plan IT Step IN Und COUGHNI R R Very R Reg IN Und COUGHNI Smc S Smc SOL Slois	ry ved ontinu jular ar oped ulose ESS v Roug gh voth kensid shed	l bus h ed	COATING CN Cleas SN Stai VNR Ver CT Coa INFILL MA X Car MU Unit MS Sec KT Chl CA Cala Fe Iron Qz Qua	an ined eeer (thin or tting (up to ' TERIALS bonaceus dentified min ondary min orite ondary min orite orite Oxide artz	patchy) 1mm) nteral eral

Chanter	TITLE	BORE	HOLE CORE PHOTOGRAPH vra Build to Rent – BH03	
Stantec	PROJECT NUMBER 304001019	TEST DATE 27/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 1 OF 3 1.24-6.00m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LAND CO PROJECT: NOWRA BUI LOCATION: BEINDA ST JOB NUMBER: 30400 1	M BHID: BI ILO TO REMT DEPTH: 1. TREET CORE TRA OIQ DATE: 2	HO3 24-6.00 NY NO: 1 & 3 7/7/23	LOGGED BY: AC
304001019 BH03 27/7/23 START 1.24N		E		
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Ctantos	TITLE	BOREHOLE CO Nowra Build	ORE PHOTOGRAPH d to Rent – BH03	
Stantec	PROJECT NUMBER	TEST DATE	INCLINATION:	CORE LENGTH: BOX 2 OF 3
	304001019	27/7/2023	-90 DEGREES	6.00-11.00m
	Hanjin B&B 8D	Total Drilling	AC	DR
Stantec	CLIENT NAME: LANDCOM PROJECT: NOWRA BUILD T LOCATION: BEINDA STREE	BH ID: BH 03 DEPTH: 6.00- ET CORE TRAY NO: DATE: 27/2/	100	LOGGED BY: AC
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Ctantos	TITLE	BOF	REHOLE CORE PHOTOGRAPH owra Build to Rent – BH03	
Stantec	PROJECT NUMBER 304001019	TEST DATE 27/7/2023	INCLINATION: -90 DEGREES	CORE LENGTH: BOX 3 OF 3 11.00-11.52m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: Total Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LAND PROJECT: NOW RA LOCATION: BEIMOA JOB NUMBER: 30400	COM BH BUILD TO RENT DE STREET CC DIOIQ DA	HID: BH 03 SPTH: 1.0 - 11.52 ORE TRAY NO: 3 & 3 TE: 27/7/23	LOGGED BY: AC
11.0	1 2		END CORE 11.52m	
		-15 M		
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(D	Sta	int	ec							в	ORE	HOLE LOG SHEET
Clie Pro	ent: ject:	l I	and	com a Build to Rent								Ho	ole No: BH201
Loc	atior	ו: ו	Beind	a St, Bomaderry NSW					Job No: 304001019				Sheet: 1 of 3
Pos	ition	: E28	0935	.000 N6140095.000 56H	I MGA	20			Angle from Horizontal: 90°		S	urface	e Elevation: 10.500 m AHD
Rig	Тур	e: Ha	njin l	D&B 8D					Mounting: Track		D	riller:	CM
Cas	sing I	Diame	eter:	NA NA			04/00				C	ontrac	ctor: South Coast Drilling
Dat	a Sta	irted:	29/0	1/23 Date Com	pletec	1: 29/	01/23		Logged By: AC		C	necke	ed By: RD
	Drillin	g		Sampling & Testing	-				Material Des	scription			
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle character colour, secondary and minor componer ROCK TYPE, grain size and type, colou fabric & texture, strength, weathering, defects and structure	ristic, nts entry ur, sou l, W	Condition	Consistency Relative Density	STRUCTURE & Other Observations
	E		ered				ند علد علد علد علد ع	ML	Sandy SILT: low plasticity, brown, fine	е м (:	>PL)		TOPSOIL
— AD/T —	VH	- NA ↓	Not Encounte		-	-		GP	0.10m grained sand SANDSTONE, recovered as Sandy GRAVEL: fine to coarse, pale orange, grey, fine to coarse grained sand, infe high strength rock 0.40m	erred	,		ROCK
					10.0 -	- 0.5			Continued as Cored Drill Hole				-
						+ + +							
					9.5	- 1.0							
0 0 0					-	- 15							
						-							
- 					8.5 -	- 2.0							-
					-	+ + +							
					8.0-	- 2.5							-
b					-	-							
					7.5-	- 3.0							
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M				DENETDATION	-		FIE	<u>ו</u>	STS SAME	PLES			
EX R HA PT SC AF AS ALL ALL WI	E EX Ri Pr DN So I Ai S Si D/V So D/V	kcavato ipper and aug ush tub pnic dril r hamm ercussio nort spin blid fligh blid fligh blid fligh blid fligh blid fligh blid fligh blid gashbor polk roll	r bucke er ing er on sam al auge t auge t auge ght aug ght aug	vt VE Very Easy (E Easy F Firm H Hard VH Very Hard (F VH Very Hard (F VH Very Hard (F VH Very Hard (F VH Very Hard (F Shown F Shown F Shown	No Resistan Refusal) Level on Inflow utflow	nce) Date	PB PDC PSI MC PB IMF PID VS		Standard Penetration Test B Hand/Pocket Penetrometer D Dynamic Cone Penetrometer ES Perth Sand Penetrometer U Moisture Content MOIS Plate Bearing Test D Borehole Impression Test M Photoionisation Detector W Vane Shear; P=Peak, LL R=Resdual (uncorrected kPa) w	 Bulk dist Disturbe Environr Thin wal STURE Dry Moist Wet Plastic li Liquid lir Moisture 	turbed d sam mental l tube ' mit nit conte	sample ple sample undistur nt	rbed' VS - Very Soft S - Soft F - Firm VSt - Stiff VSt - Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
Re	fer to ex	planatory	notes fo	or details of escriptions		S	tant	ec	Australia PTY LTD				

())	Sta	anto	ec										С	ORE LOG SHEE
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ocition	. E29	0025	000 N	JE140			JOD I	NO: 3040	0101	19 Natal: 00	0		urfaco E	Sneet: 2 of
ia Typ	0' Ha	niin	.000 F		095.000	J SON MGAZU	Mour	ntina [.] Tr	ack	Jilai. 90		 Di	riller. Cl	
asing l	Diam	eter:	NA		Bit T	vpe:	Bit C	ondition	:			C	ontracto	or: South Coast Drilling
ata Sta	arted:	29/0	1/23		Date	Completed: 29)/01/23 Loga	ed Bv: A	AC			C	necked	Bv: RD
Cc	orina		-			N	Material Description						Defec	t Description
Fluid	rcR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE characterist & min ROCK NAM	, plasticity or particle ic, colour, secondary or components E, grain size and type,	eathering	Es S Is • Axi	stimated trength (50) MPa al O-Diametral	Average Natural Defect Spacing	Visual		Additional Data DEFECT TYPE, orientation, shape, roughness, infilling
			-	-		inclusions a	& minor components	3		°		2000	C	or coating, thickness, other
			-	-			IG AT 0.40m							
k l			10.0 - - -	- 0.5		SANDSTONE, orange-brown	fine to coarse grained, brow	vn, MW						
			9.5	- 1.0										m: HB m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN
0% Water LOSS	100	97	9.0 - - - - - 8.5 - - - - - - -	- 1.5		becoming grey 10mm @ 1.88r	, with trace fossil voids up to n bgl	, sw					- 1.78 r - 1.94 r - 2.14 r - 2.18 r - 2.21 r	m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN
			8.0 - - - 7.5 - -	- 2.5 - - - - 3.0 -		2mm fossil void 2mm fossil void 3mm fossil void 10mm fossil void 3mm fossil void	d @ 2.53m bgl d @ 2.70m bgl d @ 2.78m bgl nid @ 3.08m bgl d @ 3.11m bgl						— 2.79 r — 3.08 r	m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN
	88	100	7.0	- 3.5 		<u>5mm f</u> ossil voic	<u>1 @ 3.94m bal</u>						— 3.50 r — 3.87 r	m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN
DRILLING AD/V S AD/T S HFA H WB W RR R R R R R R R R R R R R R R R R R	IG Solid flig Solid flig Hollow fl Nashbo Rotary c Rotary c Zotary c Diatube Push tub Percussi Sonic dri Air hamr	ht auge ht auge ight aug re drillin er ore (85i ore (63. ore (51. concret oe on sam illing ner	er: V-Bit rr: TC-Bi ger ig mm) .5mm) .94mm) e coring pling	t T(ATER Wate on da wate wate OCK QUA ESCRIPTI QD Roc Des CR Tota Rec	RO bar Level EH ate shown VH r inflow M r outflow L LITY RO ONS FR kk Quality SW signation (%) MM al Core HW covery (%) XW	CK STRENGTH Extremly High Very High High Uow Very Low CK WEATHERING Fresh Slightly Weathered Distinctly Weathered Moderately Weathered Highly Weathered Extremly Weathered	JT SZ BP SM FL VN CL CS FZ DL HB DB	Joint Shea Bedd Sean Folia Vein Cleav Crus Fract Drift I Hanc Drillir	rPE ing Parting n vage hed Seam ure Zone Lift ing Break ng Break	PLANA CU CC DIS LI PR P ST S UN U ROUGH VR V RF R S S S S POL P	RITY urved iscontinu regular lanar tepped ndulose iNESS ery Roug ough mooth lockensio olished	ious gh ded	COATING CN Clean SN Stained VNR Veneer (thin or patchy) CT Coating (up to 1mm) INFILL MATERIALS X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite Fe Iron Oxide Qz Quartz

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osi	tion	: E28	0935	.000 I	N6140	095.000) 56H MGA20	JOD NO Anale f	rom He	orizor	ntal: 90	0		Su	rface E	levation:	10.500 m AHI
ia 1	Tvpe	: Ha	niin	D&B 8	BD	000.000		Mounti	na: Tra	ack	11411 00			Dri	ller: Cl	M	
asi	ng D	Diame	eter:	NA		Bit T	vpe:	Bit Con	dition:					Co	ntracto	r: South	Coast Drilling
ata	Sta	rted:	29/0	1/23		Date	Completed: 29/01/2	3 Logged	By: A	C				Ch	ecked	By: RD	
	Cor	rina					Materi	al Description							Defec	t Descrip	tion
				â	Ê			icity or particle		Fst	imated	Avera	10			- <u>-</u>	
	Fluid	TCR (%)	RQD (%)	RL (m AH	Depth (m	Graphic Log	characteristic, col & minor con ROCK NAME, grai colour, fabric a inclusions & mino	bur, secondary nponents n size and type, and texture, or components	Weathering	Str Is ₍₅₎ • - Axial	ength D) MPa O-Diametral C ∞ C E ⊥ → H	Natura Defec Spacir (mm) ର ଛ ରି ହ	al et Ig	Visual		Additio EFECT TY shape, roug r coating, t	onal Data ′PE, orientation, ghness, infilling hickness, other
							SANDSTONE, fine to o	coarse grained, brown,	SW								
							orange brown (continu			; ;					— 4.11 r	n: BP, 3°, IR,	RF, CN
	SSOT			6.0 - - - - 5.5 -	- 4.5 										—— 4.79 r	n: HB	
	0% Water	88	100	5.0	- 5.5		3mm fossil void @ 5.2	7m bgl							— 5.38 r — 5.78 r	n: BP, 0°, IR, n: BP, 0°, IR,	RF. CN RF. CN
,				4.5 -	- 6.0 -		6.40m TERMINATED AT 6.40	m							— 6.22 r	n: BP, 0°, IR,	RF, CN
				4.0-	6.5		Target depth			į i							
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D/\ D/`	V So T So	olid flig olid flig	ht auge ht auge	er: V-Bit er: TC-Bit	_{it} <u>-</u>		er Level EH Extre	mly High High	JT SZ	Joint Shear	ed zone	CU DIS	Curve	d ntinue	bus	CN Cle SN Sta	ean ained
IFA VB	A Ho W	ollow fli ashbo	ight au	ger na		→ wate	r inflow H High	um s	BP	Beddir	ng Parting	IR pp	Irregul	lar r		VNR Ve	neer (thin or patchy
R	Ro	ock roll	er ore (85	mm)	-	- wate	routflow L Low VL Verv	Low	FL	Foliatio	on	ST	Stepp	ed		INFILL MA	
Q MI	C R	otary co otary co	ore (63 ore (51	.5mm) .94mm)	R	OCK QUA	LITY ROCK WE	ATHERING		vein Cleava	age	ROU	GHNES	use SS		X Ca	rbonaceus
.т.	Di	atube o ush tub	concret	e coring		QD Roc	k Quality FR Fresh	ly Weathered	FZ	Crushe Fractu	ea Seam re Zone	VR	Very F	Rougl	ı	MS Se	condary mineral
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T S S	Pe N Sc	ercussi onic dri	on san Iling	pling	_т ,	Des	signation (%) MW Mode	ctly Weathered rately Weathered	DL HB	Drift Li Handir	ft ng Break	S	Smool	th	- 4	CA Ca	lcite
T S ON H	Pe N Sc Air	ercussi onic dri r hamn	on san Iling ner	pling	т	Des CR Tota Rec	al Core (%) XW Extre	ctly Weathered rately Weathered / Weathered mly Weathered	DL HB DB	Drift Li Handir Drilling	ft ng Break I Break	S SL POL	Rougr Smoot Slocke Polish	th ensid ed	ed	CA Ca Fe Iroi Qz Qu	lcite n Oxide artz

	TITLE:	BOREH Now	OLE CORE PHOTOGRAPH ra Build to Rent - BH201	
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 1 of 2 0.40-5.00m
_	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR
Stante	CLIENT NAME: LAND PROJECT: NOWRA LOCATION: BENDA JOB NUMBER: 304	COM BHIE BUILD TO RENT DEPT ST, BOMADERRY CORE OOTOIN DATE	BH-201 H: 0.40-0.50 TRAY NO: 1 of 2 29/1/2024	LOGGED BY: AC
NOWRA BUILD TO RI LANOCOM 29/1	ENT 304001019 /2024 START CORE 0.4m			
		C. Belleville and the second second	the second second second second	autor of the second second second
1.0				1.00
1.0				
1.0 2.0 3.0				

	TITLE:	BOREF			
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 2 5.00-6.40m	2 of 2
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR	
Stante	CLIENT NAME: LAN PROJECT: NOWR LOCATION: BEING JOB NUMBER: 30	NDCOM A BUILD TO RENT DA ST, BOMADERRY 4001019	HID: BH-201 DEPTH: 5.0-6.40m ORE TRAY NO: 2 of 2 ATE: 29/1/2024	LOGGED BY: AC	
50	Contraction C.				1
60	and the second second	END CO	RE 6.40m	and the second	
	A STATERY AND ST				-
			101	NAME OF TAXABLE PARTY OF TAXABLE	15

(X	Sta	int	ec							E	BORE	HOLE LOG SHEET
Clie	ent: ject:		Lando	com a Build to la St. Boi	o Rent maderry NSW					lah Na: 201001010		Но	le No: BH202
Pos	ition	· F28	0990	000 N61	40096 000 56H		20			Angle from Horizontal: 90°		Surface	Sheet: 1 of 3 Elevation: 8 500 m AHD
Rig	Туре	: Ha	njin l	D&B 8D	10000.000 001		20			Mounting: Track		Driller:	CM
Cas	sing [Diam	eter:	NA						- · ·		Contrac	tor: South Coast Drilling
Dat	a Sta	rted:	29/0	1/23	Date Com	pletec	1: 29/	01/23		Logged By: AC		Checke	d By: RD
	Drilling	9		Samp	ling & Testing				_	Material De	escription		
Method	Resistance	Casing	Water	S	Sample or Field Test	RL (m AHD	Depth (m)	Graphic Log	lassification	SOIL TYPE, plasticity or particle characte colour, secondary and minor compone ROCK TYPE, grain size and type, colo fabric & texture, strength, weathering defects and structure	eristic, ents our, g, W O Outition	Consistency Relative Density	STRUCTURE & Other Observations
	E							لە غلە غلە غلەرغلەرغ	ML	Sandy SILT: low plasticity, brown, fir	ne M (>PL)	TOPSOIL
AD/T	VH	NA	Not Encountered			8.0	- 0.5		GP	0.15m graned sand SANDSTONE, recovered as Sandy GRAVEL: fine to coarse, pale orange grey, fine to coarse grained sand, int high strength rock 0.60m	e, ferred	, 	- ROCK - - -
										Continued as Cored Drill Hole			
ME EX R HA PT SC AH PS AD AD HF WE RF	L ETHOD C Rija A Ha Pu DN S Pe S S H A Ha S Pe S S H D/V S C A Ha S Pa C A Ha S R C A Ha S R C A Ha S R S A Ha A Ha A Ha S C N S C Ha Ha S C Ha S C Ha Ha S C Ha Ha S C Ha Ha S C Ha Ha S C Ha Ha S C Ha Ha S C Ha Ha S C Ha S C Ha Ha S C Ha S C Ha S C Ha Ha S C S C S C S C H S C S C S C S C S C S	ccavato pper and au ish tub pnic dri hamn ercussi iort spi lid fligi lid fligi blow fli ashbor pck roll	r bucke ger e ling her on samp an samp tauge t auge t auge t auge dt auge e drillin er	ot opler er ∵ V-Bit ∵ TC-Bit er g	PENETRATION VE Very Easy (N E Easy F Firm H Hard VH Very Hard (F WATER Shown water in water of	lo Resistar Refusal) Level on flow utflow	nce) Date	FIE SP HP DC PSI MC PB IMF PID VS	LD TE - - - - - - - - - - - - -	Standard Penetration Test B Hand/Pocket Penetrometer D Dynamic Cone Penetrometer U Perth Sand Penetrometer U Moisture Content MOI Plate Bearing Test D Borehole Impression Test M Photoionisation Detector W Vane Shear; P=Peak, LL R=Resdual (uncorrected kPa) W	I IDENTIFY IDE	ed sample ample ital sample be 'undisturi	SOIL CONSISTENCY VS Very Soft S Soft F Firm St Stiff VSt Very Stiff H Hard RELATIVE DENSITY VL Very Loose L Loose MD Medium Dense D Dense VD Very Dense
Ref abb	fer to exp previation	blanator is and b	/ notes fo asis of de	or details of escriptions			S	tante	ec	Australia PTY LTD			

lient: roject	:	Land Nowr	com a Buil	d to F	Rent							Hole No: BH20		
	on: 	Beind	1a St,	Boma			Job No: Angle f	: 3040 rom ⊔/	01019 prizontal: 90	0	<u> </u>	Sheet: 2 of		
ia Tvr	л. сz	aniin	D&B 8		090.000		Mountir	na. Tr	ack	Surface Elevation: 8.500 m AHD				
asing	Diam	eter:	NA		Bit T	vpe:	Bit Con	dition:			Co	ontractor: South Coast Drilling		
ata Si	arted	: 29/0	1/23		Date	Completed: 29/01/23	Logged	By: A	C	Ch	ecked By: RD			
С	Coring					Material	Description					Defect Description		
Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TYPE, plasticity characteristic, colour, & minor compo ROCK NAME, grain si colour, fabric and inclusions & minor co	/ or particle secondary nents ze and type, texture, omponents	Weathering	Estimated Strength Is ₍₅₀₎ MPa • Axial O - Diametral	Average Natural Defect Spacing (mm) _R 8 R	Visual	Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other		
0% Water LOSS	100	75	8.0			0.60m START CORING AT 0.60m SANDSTONE, fine to coars grey, orange-brown	e grained, pale	MW				 0.66 m: BP, 3°, IR, RF, SN, Fe 0.74 m: BP, 3°, IR, RF, SN, Fe 0.77 m: BP, 3°, IR, RF, SN, Fe 1.10 m: BP, 0°, IR, RF, SN, Fe 1.15 m: BP, 0°, IR, RF, CN 1.20 m: BP, 0°, IR, RF, CN 1.20 m: BP, 0°, IR, RF, CN 1.54 m: BP, 18°, IR, RF, CN 1.54 m: BP, 18°, IR, RF, CN 1.69 m: BP, 5°, IR, RF, CN 1.69 m: BP, 5°, IR, RF, CN 1.91 m: BP, 3°, IR, RF, CN 2.06 m: BP, 15°, IR, RF, CN 2.32 m: JT, 60°, IR, RF, CN 2.51 m: BP, 10°, IR, RF, CN 2.59 m: BP, 3°, IR, RF, CN 2.59 m: BP, 3°, IR, RF, CN 3.14 m: BP, 5°, IR, RF, CN 3.25 m: BP, 10°, IR, RF, CN 3.25 m: BP, 10°, IR, RF, CN 3.38 m: BP, 3°, IR, RF, CN 3.42 m: BP, 3°, IR, RF, CN 3.42 m: BP, 3°, IR, RF, CN 		
DRILLI	100	84	-	- - 	ATER	2mm fossil void @ 3.71m b	gl	DEEE						
AD/V AD/T HFA WB RR RR PQ HQ NMLC DT PT PS SON AH	Solid flig Solid flig Hollow f Washbo Rock ro Rotary o Rotary o Diatube Push tu Percuss Sonic d Air ham	ght auge ght auge light auge light auge pre drillir ller core (85 core (63 core (51 concet be sion sam rilling mer	r: V-Bit r: TC-Bi ger 1g mm) .5mm) .94mm) e coring pling	t R D R	Wate on da wate wate CR QUA CR Tota	r Level EH Extremly I ate shown VH Very High r inflow H High r outflow L Low VL Very Low XLITY ROCK WEATH ONS FR Fresh sk Quality SW Slightly W signation (%) MW Moderatel al Core HWV Highly Wc	ERING 'eathered Weathered by Weathered pathered	JT SZ BP SM FL VN CL CS FZ DL B B DB	Joint Sheared zone Bedding Parting Seam Foliation Vein Cleavage Crushed Seam Fracture Zone Drift Lift Handing Break	CU Cun DIS Disc IR Irreg PR Plar ST Ster UN Und ROUGHNI VR Very RF Rou S Smc	/ed continue gular aar ulose ESS / Roug gh coth kensid	h KT Chlorite CA Clean SN Stained VNR Veneer (thin or patchy CT Coating (up to 1mm) INFILL MATERIALS X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite Fe Iron Oxide		

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oject:	n:	Now	a Bui da St	ld to F Boma	Rent derry N	ISW	Joh Na	2040	01010									
sition	n: E28	0990	.000 I	N6140	096.000) 56H MGA20	Angle f	rom Ho	orizontal:	90°)		Su	Irface E	levation: 8.500 m AHI			
Rig Type: Hanjin D&B 8D							Mountir	ng: Tra	ack				Dr	iller: Cl	M			
sing	Diam	eter:	NA		Bit T	уре:	Bit Con	Bit Condition:						Contractor: South Coast Drilling				
ta St	arted:	29/0	1/23		Date	Completed: 29/01/23	Logged	By: A	NC				Cł	necked	By: RD			
C	oring	-				Material	Description		1					Defec	t Description			
Fluid	TCR (%)	RQD (%)	RL (m AHD	Depth (m)	Graphic Log	SOIL TYPE, plastici characteristic, colouu & minor comp ROCK NAME, grain s colour, fabric and inclusions & minor of	y or particle ; secondary onents ize and type, I texture, components	Weathering	Estimate Strength Is ₍₅₀₎ MPa ●-Axial O-Diar 5 5 - ∞ ⊃ _ ≥ ⊥ 5	di netral ♀ 	Av Ni D Sp () 20	rerage atural refect pacing mm)	Visual		Additional Data EFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other			
				+ +		SANDSTONE, fine to coa grey, orange-brown <i>(conti</i> 15mm fossil void @ 4.15n	rse grained, pale <i>וועפל)</i> ו bgl	SW						- 4.15 r - 4.35 r	n: BP, 3°, IR, RF, CN n: BP, 3°, IR, RF, CN			
			4.0 -	- 4.5 										4.44 r 4.50 r 4.57 r 4.65 r 4.65 r	n: BP, 3°, IR, RF, CN n: BP, 3°, IR, RF, CN n: BP, 20°, IR, RF, CN n: BP, 5°, IR, RF, CN n: BP, 5°, IR, RF, CN			
			3.5 -	- 5.0										4.71 r 4.74 r	n: BP, 5°, IR, RF, CN n: BP, 5°, IR, RF, CN			
0% Water LOSS	100	84		+ + +										5.09 r	n: BP, 0°, IR, RF, CN			
			3.0 -	- 5.5										— 5.59 r	n: BP, 0°, IR, RF, CN			
			2.5 -	- 6.0		5mm fossil void @ 6,12m	bal								n: BP, 3°, IR, RF, CN n: BP, 10°, IR, RF, CN			
			2.0-	- 6.5		6.54m								- 6.42 r	n: BP, 3°, IR, RF, CN			
				-		TERMINATED AT 6.54 m Target depth				 								
				ł														
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RILLIN D/V S D/T S D/T S FA H B \ R F H R VILC F T F	IG Solid flig Solid flig Hollow fl Washbo Rock roll Rotary c Rotary c Rotary c Diatube Push tub Percussi	ht aug ht aug ight au er ore (85 ore (63 ore (51 concre ie on sar	er: V-Bit ger ng 5mm) 5.5mm) .94mm) te coring npling	it -	ATER Wate on da wate wate wate CCK QUA ESCRIPTI QD Roc Des	r Level ate shown r inflow r outflow LITY ONS k Quality ignation (%) ROCK STREM H High M Medium L Low VL Very Hig M Medium L Low VL Very L	IGTH High n ' HERING Veathered Weathered Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL	CT TYPE Joint Sheared zon Bedding Par Seam Foliation Vein Cleavage Crushed Sea Fracture Zon Drift Lift	e ing im e	F 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PLANARIT CU Curv DIS Disc R Irreg PR Plan ST Step JN Und ROUGHNE VR Very R Rouu	ry ved continu jular lar ulose ulose ESS v Roug gh	ous h	COATING CN Clean SN Stained VNR Veneer (thin or patchy CT Coating (up to 1mm) INFILL MATERIALS X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite			

	TITLE:	BOREH	OLE CORE PHOTOGRAPH ra Build to Rent - BH202	
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 1 of 2 0.60-5.00
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR
Stante	CLIENT NAME: LAN PROJECT: NOWR LOCATION: BEAND JOB NUMBER: 30	NDCOM BHID: A BUILD TO RENT DEPTH DA ST, BOMADERRY CORE 4001019 DATE	BH-202 0.60-5.00m TRAY NO: 1 of 2 29/1/2024	LOGGED BY: AC
304001019 NOW LANDCOM 24/	LA BUILD TO RENT &	14202 RE 0.60m		
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2.0	1. 9	1.1		TOT
3.0	J & J		and the second second	515
4.0	0	1	1.11	

	TITLE:	BORE	HOLE CORE PHOTOGRAPH	
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 2 of 2 5.00-6.54m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDO PROJECT: NOWRA B LOCATION: BEINDA S JOB NUMBER: 3040	COM BHIL SUILD TO RENT DEP ST, BOMADERRY COR DIOIQ DATE	BH-202 TH: 5.0-6.54m E TRAY NO: 2 of 2 29/1/2024	LOGGED BY: AC
		R	at the second	
5.0				
6.0 + 4	- 1: 30 C		END CORE 6.54	m
	Contraction of	A CARLER OF CARLES		
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(S	Sta	int	ec								в	ORE	HOLE	LOG SHEET		
Clie Pro	ent: oject:	 1:	_and Nowr Beinc	com a Build to la St. Bor	Rent					Job No: 30/001019			Нс	ole No	D: BH203		
Pos	sition	· F28	0977	000 N61	40077 000 56H	MGA	20			Angle from Horizontal	90°		Surface	e Elevatio	n [.] 8 600 m AHD		
Rig		: Ha	njin	D&B 8D						Mounting: Track			Driller:	CM			
Cas	sing [Diam	eter:	NA						•		(Contra	ctor: Sou	th Coast Drilling		
Dat	a Sta	rted:	29/0	1/23	Date Com	pletec	l: 29/	01/23		Logged By: AC		0	Checked By: RD				
	Drillin	g		Samp	ling & Testing					Mate	erial Descripti	on					
Method	Resistance	Casing	Water	S	ample or ield Test	RL (m AHD	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle c colour, secondary and minor cr ROCK TYPE, grain size and ty fabric & texture, strength, we defects and structure	characteristic, omponents /pe, colour, eathering, e	Moisture Condition	Consistency Relative Density	& O	STRUCTURE ther Observations		
	E		red					لد علد علد بار بار ر	ML	Sandy SILT: low plasticity, br	rown, fine	M (>PL)		TOPSOIL			
A—AD/T —	VH	NA	Not Encounte			8.5	-		GP	0.10m grained sand SANDSTONE, recovered as GRAVEL: fine to coarse, pal grey, fine to coarse grained s 0.35m high strength rock	Sandy e orange, sand, inferred			ROCK	-		
						-	-			Continued as Cored Drill Hol	le				-		
						- 8.0 – -	- 0.5 - -										
						- - 7.5	- 1.0								-		
						-	-								-		
						7.0 -	- 1.5 - -										
						6.5	- 2.0								-		
						-	- - - 2.5								- - -		
						6.0	-								-		
						5.5	- 3.0 								-		
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						5.0 -	-								-		
MI E> R HA PT SC AF AS AL HF	ETHOD (Ex Ri A Ha DN So H Ai B Pe S Sh D/V So D/V SO	ccavato pper and aug ush tub pric dril r hammer crussio port spi plid fligh plid fligh plow flig ashbor	r bucke jer e ling ier on sam al auge it auge t auge ght auge ght auge drillin	pler er r: V-Bit r: TC-Bit ger 19	PENETRATION VE Very Easy (N E Easy F Firm H Hard VH Very Hard (R WATER WATER Shown water in water on	o Resistan efusal) evel on flow utflow	nce) Date	FIE SPT HP DCI PSF MC PBT IMP PID VS		STS Standard Penetration Test Hand/Pocket Penetrometer Dynamic Cone Penetrometer Perth Sand Penetrometer Moisture Content Plate Bearing Test Borehole Impression Test Photoionisation Detector Vane Shear; P=Peak, R=Resdual (uncorrected kPa)	SAMPLES B - Bull D - Diss ES - Env U - Thin MOISTURE D - Dry M - Moi W - We PL - Plat LL - Liqu W - Moi	k disturbe turbed sar ironment n wall tube stic limit stic limit sture con	d sample mple al sample e 'undistu tent	rbed'	SOIL CONSISTENCY VS Very Soft S Soft F Firm St Stiff VSt Very Stiff H Hard RELATIVE DENSITY VL Very Loose L Loose MD Medium Dense D Dense		
Reab	fer to ex	DCK FOIL	r v notes fo	or details of escriptions			S	 stante	ec .	Australia PTY LT[D				vu - veryuense		

ent: oiect:		Land	com a Buil	d to F	Rent								Hol	e No: BH20
catio	n:	Beind	la St,	Boma	aderry	NSW	Job No:	3040	01019					Sheet: 2 c
sitior	1: E28		.000 N	16140	077.00	0 56H MGA20	Angle f	rom He	orizontal:	90°	5	Su	Inface E	Elevation: 8.600 m AHE
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sing	Diam	eter:	NA 4/02		Bit	Type: Impreg	Bit Con	altion:	good				ontracto	
	inteu.	29/0	1/23		Dau	e completeu. 29/01/23	Loggeu	Бу. А	40			G	Dufu	
	oring	1	â			Material I	Description			_			Defec	t Description
Fluid	TCR (%)	RQD (%)	RL (m AHC	Depth (m)	Graphic Log	SOIL TYPE, plasticity characteristic, colour, & minor compo ROCK NAME, grain si colour, fabric and inclusions & minor co	y or particle secondary nents ze and type, texture, omponents	Weathering	Estimate Strength Is ₍₅₀₎ MPa • - Axial O - Dian 5 5 - 0 2 - 2 1 5	d netral P H	Average Natural Defect Spacing (mm) & & & & & & & & & & & & & & & & & & &	Visual	D s c	Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other
0% Water LOSS	100	92	8.5	- - - - - - - - - - - - - - - - - - -		0.35m START CORING AT 0.35m SANDSTONE, fine to coan grey, orange-brown becoming grey, with trace 1 10mm @ 1.70m bgl 5mm fossil void @ 2.04m b 30mm fossil void @ 2.77m 5mm fossil void @ 3.04m b	se grained, pale	SW						n: BP, 5°, IR, RF, CN n: BP, 5°, IR, RF, VNR, clay, pale n: BP, 5°, ST, RF, CN n: JT, 90°, IR, RF, CN n: BP, 5°, IR, RF, CN n: BP, 10°, IR, RF, CN n: BP, 3°, IR, RF, CN n: BP, 3°, IR, RF, CN n: BP, 3°, IR, RF, CN
	100	96	- - 5.0 — - -	- 3.5 - -		10mm fossil void @ 3.43m 30mm fossil void @ 3.66m	bgl bgl						— 3.58 r — 3.69 r — 3.73 r	m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN m: BP, 3°, IR, RF, CN m: BP, 3° IP, BE, CN
RILLIN D/V S D/T S FA H /B V	G Solid flig Solid flig Hollow fl Vashbo	ht auge ht auge ight aug re drillir	er: V-Bit er: TC-Bit ger og	+ t -	VATER Wate on c wate	ter Level EH Extremly late shown er inflow High M Medium	GTH High	DEFE JT SZ BP SM	CT TYPE Joint Sheared zon Bedding Part Seam	e ting	I I I I I I I I I I I I I I II I IR Irreg PR Plana	ed ontinu ular ar	ous	COATING CN Clean SN Stained VNR Veneer (thin or patch) CT Coating (up to 1mm)
B Washibote reliming Construction Washibote reliming Construction Rotary core (85mm) Q Rotary core (85mm) MLC Rotary core (51.94mm) T Diatube concrete coring T Percussion sampling DN Sonic oftliling H Air hammer						er outtiow L Low VL Very Low ALITY ROCK WEATH TONS FR Fresh ck Quality signation (%) W Distinctly wW Moderate tal Core HW Highly WA	ERING Veathered Weathered y Weathered	FL VN CL CS FZ DL HB	Foliation Vein Cleavage Crushed Sea Fracture Zon Drift Lift Handing Bre	am e ak	ST Step UN Undu ROUGHNE VR Very RF Roug S Smo SI Slod	ped Jose SS Roug gh oth kensid	h	INFILL MATERIALS X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite Ee Iron Oxide

(D	Sta	int	ec												С	ORE	LOG	SHEET
Clie Proj	nt: ject:		Land	lcom ra Bu	ild to l	Rent			1.1. N.			•				Hol	e No): B	H203
	ition	· E29	007	ua 31	N6140			0	JOD NO	: 3040	0101 orizo	9 Intal: 00	0		<u> </u>	rfaco E	lovation		
Ria	Type	. EZO	niin	1.000	80140	077.000		0	Mounti	non Tra	ack	illai. Ji			- Su Dri	llor Cl	M	1. 0.000	
Cas	ina I)iam	oter:	NA	00	Bit T	vne: imnred	1	Bit Condition: good						Co	ntracto	r: Sout	h Coast	Drilling
Data	ta Started: 29/01/23 Date Completed: 29/01/23						29/01/23	Logged	Bv: A		54			Ch	ecked	Bv: RD		29	
	Co	rina						cription	- ,						Defec	t Descri	ntion		
Method	Fluid	rcr (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	SOIL TY characte & ROCK N	/PE, plasticity or peristic, colour, sec minor component AME, grain size a	particle condary is ind type,	eathering	Es St Is ₍	timated trength ₅₀₎ MPa	Ave Nat De Spa	rage ural fect cing	Visual	D	Addi EFECT T shape, rou	tional Data YPE, orier ughness, ii	itation, ifilling
_			ш.				inclusio	ns & minor comp	onents	Š	。。 「「「」	≥ ∓ ≥ ≞ > - ∞ ÷	8 8			c	r coating,	thickness	other
				4.5	- - - - - 4.5		SANDS I C grey, orang 5mm fossil 3mm fossil	INE, fine to coarse gr ge-brown <i>(continued)</i> I void @ 4.33m bgl I void @ 4.60m bgl	ained, pale	SW						— 4.19 r — 4.34 r	n: BP, 3°, If n: BP, 3°, If	R, RF, CN R, RF, CN	
	0% Water LOSS	100	96	3.5	- 		5mm fossil	l void @ 4.93m bgl								— 5.10 r — 5.33 r — 5.46 r	n: BP, 3°, IF n: BP, 0°, IF n: BP, 0°, IF	R, RF, CN R, RF, CN R, RF, CN	
				3.0													n: BP, 5°, If n: BP, 0°, If n: BP, 0°, If	R, RF, CN R, RF, CN R, RF, CN	
Y					-		6.45m												
					- 6.5		TERMINAT Target dep	TED AT 6.45 m oth											
				2.0	- 7.0														
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DR AD AD HF, WE RR PQ HQ NM DT PT PS SO AH	// SS/// SS/// SS/// SS/// RR/// RR/// RR/// RR/// RR/// RR/// RR/// R/// R/	G olid flig olid flig ollow fl /ashbo ock roll otary c otary c otary c otary c otary c otary c otary c otary c otary c	ht aug ight au ight au ier ore (85 ore (65 ore (5 concre e on sar lling ner	er: V-Bi er: TC-I iger ng 5mm) 3.5mm) 1.94mm ite corin npling	t Bit -	VATER Wate on di wate Wate Wate CCK QUA COCK COCK QUA COCK COCK QUA COCK COCK COCK COCK COCK COCK COCK COCK COCK COCK COCK COCK COCK COCK	er Level ate shown r inflow r outflow kLITY IONS x Quality signation (%) al Core sovery (%)	ROCK STRENGTH EH Extremly High VH Very High M Medium L Low VL Very Low ROCK WEATHERIN FR Fresh SW Slightly Weath DW Districtly Weath W Moderately We HW Highly Weathe XW Extremly Weath	IG ered hered sathered red hered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	CT TY Joint Sheau Beddi Seam Foliat Vein Cleav Crush Fractu Drift L Hand Drillin	PE red zone ing Parting ion rage ned Seam ure Zone .ift ing Break g Break	PI CL DI IR PF ST UT Rf SL SL PC	ANARI J Cun S Disc Irreg Plan Step N Und DUGHNI R Veny R Veny R Veny Smo Sloc	ry ved continue gular pped ulose ESS v Rougi gh coth ckensid shed	bus n ed	COATIN CN C SN S VNR V CT C INFILL N X C MU U MS S KT C CA C Fe Ir Qz C	G lean tained eneer (thin oating (up t IATERIALS arbonaceus arbona	or patchy) o 1mm) ninteral ineral
Ref abb	er to exp	planator	notes	for detail	s of			Stanted	Austra	alia F	Ptv	Ltd							

	TITLE:	BOREH	OLE CORE PHOTOGRAPH ra Build to Rent - BH203	
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 1 of 2 0.45-5.00m
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR
Stante	CLIENT NAME: LI PROJECT: NOW LOCATION: BEN JOB NUMBER: 3	ANDCOM BH RA BUILD TO RENT DEF VDA ST, BOMADERRY COI 04001019 DAT	ID: BH-203 PTH: 0.45-5.0m RE TRAY NO: 1 of 2 TE: 29/1/2024	LOGGED BY: AC
304001019 NOWE LANDCOM 29/12	A BUILD TO RENT	15m	TUL	B LO
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2.0	te .			
3.0	PH.	E .	1 1	
4.0	E.i			

	TITLE:	BOREH	IOLE CORE PHOTOGRAPH	
		Now	ra Build to Rent - BH203	
Stantec	PROJECT NO: 304001019	TEST DATE: 29/01/2024	INCLINATION: -90°	CORED LENGTH: BOX 2 of 2 5.00-6.45
	DRILL RIG: Hanjin B&B 8D	CONTRACTOR: South Coast Drilling	LOGGED BY: AC	CHECKED BY: DR
Stantec	CLIENT NAME: LANDC PROJECT: NOWRA B LOCATION: BEINDA S JOB NUMBER: 30400	OM BH ID: WILD TO RENT DEPTH T, BOMADERRY CORE DIOIQ DATE:	BH-203 5.0-6.45m TRAY NO: 1 of 2 29/1/2024	LOGGED BY: AC
5.0				
6.0		END CO	DRE 5.45m	
	· · · · · · · · · · · · · · · · · · ·	A approximation		
18:00			No.	
1	0.0	ALC: NO	1 There	
Appendix D LABORATORY CERTIFICATES





Postal: 2/15 Miall Way, Albion Park Rail NSW 2527Lab: 2/15 Miall Way, Albion Park Rail NSW 2527Telephone:+61 (02) 4256 1684E-Mail:illawarra@asct.com.auMobile:0497 979 929A.B.N.24 625 062 600

		A.B.N.	34 635 062 609		
	Report on Uniaxial	Compressive Strength (UCS)		
Client:	Stantec Australia Pty Ltd		Report No:	1211	
Client Address:	16 Burelli St, Wollongong NSW	2500	Report Date:	31/07/2023	
Project:	Geotechnical Testing	Report Page:	Page 1 of 1		
Works Component:	Beinda Street. Bomaderry			26	
Material Used:	Core	Test Request:	304001019		
Material Description:	Sandstone	Lot Number:	-		
Lot Comments:	-		ITP/PCP Number	-	
Lab Test Date/s:	Laboratory testing 29/07/2023		Control Line	BH01	
Sample Date:	27/07/2023		Sample Number:	13335	
	Uniaxial C	ompressive Strength			
Client ID Number		Failure Mode	(DS) Double Shear		
Borehole	BH01	Failure Sketch			
Depth	3.1-3.3m		F	$ \rightarrow $	
Lithological Description	Sedimentary				
Type of Testing Machine	ILLACON02			$\Lambda / 1$	
Date of Test	29/07/2023			V	
Height (mm)	143.0			Y I	
Diameter (mm)	51.8				
Test Duration (mins)	5.90	Rate Displacement (mm/min)	0.10		
UCS (Mpa)	31	Moisture Content (%)	2.9		
	_				
Specimen	- Before Testing	Spe	cimen - After Testing		
Sampling & Test Methods (Results	relate only to the items sampled/tested	Report Endorsement			
Sampled by Client: Results apply to	the sample/s as received. **				
As Received: Samples stored & Teste	ed in as received condition.	NATA		21/ 1/	
AS4133.4.2.2: (2013) Determination AS4133.1.1.1: (2005) Determination	of Uniaxial Compressive Strength (<50MI of moisture content of rock, oven drying.	Accredited for compliance with ISO/IEC 17025 - Testing. NATA Accreditation number	n Issued By: A er: 20656	P.Baltoski pproved Signatory	
(** NATA accreditation does not	t cover the performance of this service)				



Postal: 2/15 Miall Way, Albion Park Rail NSW 2527Lab: 2/15 Miall Way, Albion Park Rail NSW 2527Telephone:+61 (02) 4256 1684E-Mail:illawarra@asct.com.auMobile:0497 979 929

	-	A.B.N.	34 635 062 609	
	Report on Uniaxial Co	mpressive Strength (UCS)		
Client:	Stantec Australia Ptv Ltd	· · · · · · · · · · · · · · · · · · ·	Report No:	1212
Client Address:	16 Burelli St. Wollongong NSW 25	00	Report Date:	31/07/2023
Project:	Geotechnical Testing		Report Page:	Page 1 of 1
Works Component:	Beinda Street Bomaderry		Project No:	26
Material Used:	Coro		Tost Poquost:	20/001010
Material Description	Conditions		lest Number	504001019
Material Description:	Sandstone		Lot Number:	-
Lot Comments:	-		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/07/2023		Control Line:	BH01
Sample Date:	27/07/2023		Sample Number:	13336
	Uniaxial Com	pressive Strength	T	
Client ID Number		Failure Mode	(DS) Double Shear	
Borehole	BH01	Failure Sketch	-	
Depth	5.1-5.3m		N	-1
Lithological Description	Sedimentary			\ /
Type of Testing Machine	ILLACON02			$\Lambda / 1$
Date of Test	29/07/2023			V
Height (mm)	147		<u> </u>	Y I
Diameter (mm)	51.8			
Tast Duration (mins)		Poto Dicale com ont (mm (min)	0.10	
	0.65	Rate Displacement (mm/mm)	0.10	
ocs (mpa)	54:1	Moisture Content (%)	5.0	
<u>En e sime s</u>	Defere Testing		imon After Testing	
Sampling & Test Methods (Result	s relate only to the items sampled/tested)	Re	eport Endorsement	
Sampled by Client: Results apply to	the sample/s as received. **	^		1
As Received: Samples stored & Tes AS4133.4.2.1: (2007) Determination of AS4133.1.1.1: (2005) Determination	ted in as received condition. Uniaxial Compressive Strength (50MPa & greater) n of moisture content of rock, oven drying.	Accredited for compliance with ISO/IEC 17025 - Testing. NATA Accreditation numbe	Issued By: r: 20656	P.Baltoski pproved Signatory
(** NATA accreditation does no	ot cover the performance of this service)			



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		A.B.N.	34 635 062 609		
	Report on Uniaxial Co	mpressive Strength (UCS)			
Client:	Stantec Australia Ptv Ltd		Report No:	1336-UCS	
Client Address:	16 Burelli St, Wollongong NSW 25	Report Date:	5/02/2024		
Proiect:	Geotechnical Testing	Report Page:	Page 1 of 1		
Works Component:	Nowra Build To Rent - Beinda Stre	Project No:	26		
Material Used:	-		Test Request:	304001019	
Material Description:	Sandstone Core		Lot Number:	-	
Lot Comments:	-		ITP/PCP Number:	-	
Lab Test Date/s:	Laboratory testing 02/02/2024		Control Line:	BH201	
Sample Date:	29/01/2024		Sample Number:	20074	
	Uniaxial Com	pressive Strength			
Client ID Number		Failure Mode	(d) Tensile Dominate	ed	
Borehole	BH201	Failure Sketch	(1)		
Depth	0.4-0.7		Г		
Lithological Description	Sedimentary			$\{ \}$	
	Scamentary			{ }}	
Type of Testing Machine	ILLACON02			} {	
Date of Test	2/02/2024			· }[]	
Height (mm)	132.0			i {	
Diameter (mm)	51 3				
Test Duration (mins)	9.30	Rate Displacement (mm/min)	0.10		
UCS (Mpa)	34	Moisture Content (%)	2.9		
		Moisture content (%)	2.0		
Specimen - Be	fore Testing	Spec	imen - After Testing		
Sampling & Test Methods (Results related	te only to the items sampled/tested)	Report Endorsement			
Sampled by Client: Results apply to the s	ample/s as received. **	A		^	
As Received: Samples stored & Tested in AS4133.4.2.2: (2013) Determination of U AS4133.1.1.1: (2005) Determination of m	as received condition. niaxial Compressive Strength (<50MPa) noisture content of rock, oven drying.	NATA	F.	ml.	
		Accredited for compliance with ISO/IEC 17025 - Testing. NATA Accreditation number	Issued By: Ap	[®] P.Baltoski oproved Signatory	
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		A.B.N.	34 635 062 609		
	Report on Uniaxial Co	mpressive Strength (UCS)			
Client:	Stantec Australia Ptv Ltd		Report No:	1337-UCS	
Client Address:	16 Burelli St. Wollongong NSW 25	00	Report Date:	5/02/2024	
Project:	Geotechnical Testing	Report Page:	Page 1 of 1		
Works Component:	Deant: Nowra Build To Pent - Reinda Street Romaderry			26	
Material Used:	Nowra Build To Kent Bennua Stre	Tost Poquost:	20/001010		
Material Description:	- Sandstana Cara		let Number	304001019	
Material Description:	Sandstone core		LOU NUMBER:	-	
Lot Comments:	-		TIP/PCP Number:	-	
Lab Test Date/s:	Laboratory testing 02/02/2024		Control Line:	BH202	
Sample Date:	29/01/2024		Sample Number:	20075	
	Uniaxial Com	pressive Strength			
Client ID Number		Failure Mode	(c) Mixed Mode		
Borehole	BH202	Failure Sketch			
Depth	0.75-1.00		5	}	
Lithological Description	Sedimentary				
			P	(
Type of Testing Machine	ILLACON02				
Date of Test	2/02/2024		r	1	
Height (mm)	132.1			{	
Diameter (mm)	51.7				
Test Duration (mins)	5.30	Rate Displacement (mm/min)	0.10		
UCS (Mpa)	20	Moisture Content (%)	4.0		
		Wolstare content (%)			
Specimen - Be	fore Testing	Specimen - After Testing			
Sampling & Test Methods (Results relat	te only to the items sampled/tested)	Report Endorsement			
Sampled by Client: Results apply to the sa As Received: Samples stored & Tested in AS4133.4.2.2: (2013) Determination of U AS4133.1.1.1: (2005) Determination of m	ample/s as received. ** as received condition. niaxial Compressive Strength (<50MPa) noisture content of rock, oven drying.	Accredited for compliance with ISO/IEC 17025 - Testing. NATA Accreditation number	Issued By: A r: 20656	P.Baltoski pproved Signatory	
(** NATA accreditation does not cov	er the performance of this service)				



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		A.B.N.	34 635 062 609		
	Report on Uniaxial Co	mpressive Strength (UCS)			
Client:	Stantec Australia Ptv Ltd		Report No:	1338-UCS	
Client Address:	16 Burelli St. Wollongong NSW 25	00	Report Date:	5/02/2024	
Project:	Geotechnical Testing	Report Page:	Page 1 of 1		
Works Component:	nonant: Nowra Build To Pont - Reinda Street Remaderny			26	
Material Used:	Nowia build to kellt - bellida Street, bolladelly			20/001010	
Material Description:	- Candatana Cara		lest Number	304001019	
Material Description.	Salustone core		LOU NUTIDET.	-	
Lot Comments:	-		TIP/PCP Number:	-	
Lab Test Date/s:	Laboratory testing 02/02/2024		Control Line:	BH203	
Sample Date:	29/01/2024		Sample Number:	20076	
	Uniaxial Com		(d) Tanaila Danainata	4	
Client ID Number	BU202	Failure Mode	(d) Tensile Dominate	u	
Borenole	BH203	Failure Sketch	Г		
Depth	1.85-2.00				
Lithological Description	Sedimentary		· · · · · · · · · · · · · · · · · · ·	{ {{	
Type of Testing Machine	ILLACON02			} {,	
Date of Test	2/02/2024			{)	
Height (mm)	133.9		}	{	
Diameter (mm)	51.1				
Test Duration (mins)	7.30	Rate Displacement (mm/min)	0.10		
UCS (Mpa)	42	Moisture Content (%)	3.7		
			-		
Specimen - Befc	ore Testing	Specimen - After Testing			
Sampling & Test Methods (Results relate	only to the items sampled/tested)	Report Endorsement			
Sampled by Client: Results apply to the sar As Received: Samples stored & Tested in a AS4133.4.2.2: (2013) Determination of Uni AS4133.1.1.1: (2005) Determination of mo	nple/s as received. ** s received condition. axial Compressive Strength (<50MPa) isture content of rock, oven drying.	Accredited for compliance with ISO/IEC 17025 - Testing. NATA Accreditation number	Issued By: Ap	P.Baltoski oproved Signatory	
(** NATA accreditation does not cover	the performance of this service)				

Appendix E IMPORTANT INFORMATION





Important Information about this Geotechnical Report

Scope of Work

The purpose of this report and any associated documentation is expressly stated in the document. This document does not form a complete assessment of the site, and no implicit determinations about Stantec's scope can be taken if not specifically referenced. Whilst this report is intended to reduce geotechnical risk, no level of detail or scope of work can entirely eliminate risk.

The nature of geotechnical data typically precludes auxiliary environmental assessment without undertaking specific methods in the investigation. Therefore, unless it is explicitly stated in the scope of work, this report does not provide any contamination or environmental assessment of the site or adjacent sites, nor can it be inferred or implied from any component of the document.

The scope of work, geotechnical information, and assessments made by Stantec may be summarised in the report; however, all aspects of the document, including associated data and limitations should be reviewed in its entirety.

Standard of care

Stantec have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, data that was available or was collected, and previous experience.

Stantec's findings and assessment represent its reasonable judgment, diligence, skill, with sound professional standards, within the time and budget constraints of its commission. No warranty, expressed or implied, is made as to the professional advice included in this report.

Data sources

In preparing this document, or providing any consulting services during the commission, Stantec may have relied on information from third parties including, but not limited to; sub-consultants, published data, and the Client including its employees or representatives. This data may not be verified and Stantec assumes no responsibility for the adequacy, incompleteness, inaccuracies, or reliability of this information.

Stantec does not assume any responsibility for assessments made partly, or entirely based on information provided by third parties.

Variability in conditions and limitations of data

Subsurface conditions are complex and can be highly variable; they cannot be accurately defined by discrete investigations. Geotechnical data is based on investigation locations which are explicitly representative of the specific sample or test points. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and there are unknowns or variations in ground conditions between test locations that cannot be inferred or predicted.

The precision and reliability of interpretive assessment between discrete points is dependent on the uniformity of the subsurface strata, as well as the frequency, detail, and method of sampling or testing.

Subsurface conditions are formed by various natural and anthropogenic processes and therefore are subject to change over time. This is particularly relevant with changes to the site ownership or usage, site boundary or layout, and design or planning modifications. Aspects of the site may also not be able to be determined due to physical or project related constraints and any information provided by Stantecca cannot apply following modification to the site, regulations, standards, or the development itself.

It is important to appreciate that no level of detail in investigation, or diligence in assessment, can eliminate uncertainty related to subsurface conditions and thus, geotechnical risk. Stantec cannot and does not provide unqualified warranties nor does it assume any liability for site conditions not observed or accessible during the investigations.



Verification of opinions and recommendations

Geotechnical information, by nature, represents an opinion and is based extensively on judgement of both data and interpretive assessments or observation. This report and its associated documentation are provided explicitly based on Stantec's opinion of the site at the time of inspection, and cannot be extended beyond this.

Any recommendations or design are provided as preliminary until verified on site during project implementation or construction. Inspection and verification on site shall be conducted by a suitably qualified geotechnical consultant or engineer, and where subsurface conditions or interpretations differ from those provided in this document or otherwise anticipated, Stantec must be notified and be provided with an opportunity to review the recommendations.

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