

G3 56 Delhi Road North Ryde NSW 2113

P +61-2 9812 5000
 F +61-2 9812 5001
 E mailbox@psm.com.au

www.psm.com.au

Our Ref: PSM4815-004L Rev3

24 January 2023

Senior Project Manager JBS&G Level 1, 50 Margaret Street Sydney NSW 2000 mdelandro@jbsg.com.au

Attention: Michelle Delandro

Dear Michelle

RE: RESIDENTIAL DEVELOPMENT, EDMONDSON PARK SOUTH – RESULTS OF GEOTHECHNICAL INVESTIGATION

1. Introduction

This letter presents the results of the geotechnical investigation undertaken by PSM for the proposed residential development in Edmondson Park South. This work has been undertaken in accordance with our proposal, PSM4815-001L Rev1, dated 29 June 2022.

2. Background

To assist in preparing this letter, we were provided with the following documents:

- Invitation to tender (ref. Tender No. BPA 14774)
- A drawing showing the precinct 3 Concept Layout Plan for Lot 2,3 & 5 by Urbanco (ref: 021.EP.015.05), dated 14 September 2022
- Site surveys for precinct 3, ref.22-000141-DET1, dated 09 December 2022.
- Based on the documents above and email correspondence, we understand the following:
 - The site (Lot 5 DP 1272931) has an area of 11.9 ha
 - The proposed development comprises subdivision of the site into a minimum of 250 residential lots comprising standard one/two storey dwellings and terrace houses, recreational space (including a sports oval), local roads and designated drainage areas
 - The Ingleburn Military Heritage Precinct (Bardia Barracks) is listed as an item of State Heritage significance on the State Heritage Register and lies wholly within Lot 4 DP 1272931.

Inset 1 presents the concept plan of the site.



Inset 1: Concept plan of site (Thick red boundary indicates site boundary as per Lot 3 & Lot 5)

3. Geotechnical Investigation – October 2022

3.1 Fieldwork

The fieldwork was undertaken on 17 to 21 October 2022, under the full-time supervision of a PSM geotechnical engineer who undertook the following tasks:

- Directing the test locations
- Preparing engineering logs of the material encountered
- Collecting of soil samples for a geotechnical and analytical laboratory testing
- Supervising the installation of 3 standpipe piezometers.

A total of thirty (30) augered boreholes were drilled across the Site using a 5.5-tonne track mounted drill rig. The boreholes were drilled to a maximum depth of typically 5.0 m with three boreholes (BH15, BH29, BH30) extended to 12 m for piezometer installation. The majority of the boreholes (22 in total) were commenced by using V - bit in soil units and subsequently TC - bit following V - bit refusal. The remaining 8 boreholes were drilled using TC - bit from the beginning. Standard penetration testing (SPT) was undertaken at approximately 1.5m intervals in the boreholes.

The borehole locations were recorded with a hand-held GPS with a horizontal accuracy +/- 5m. The elevations were inferred based on the recorded location from the survey drawing provided to us by JBS&G (ref. 22-000141-DET1).

Prior to drilling, DBYD plans were reviewed and on-site service location "scans" were undertaken by a service locator to check the borehole locations for the presence of buried utilities.

At the completion of drilling, the boreholes were backfilled with excavated spoil and sand as required.

Figure 1 presents a site locality plan showing the borehole locations. Figures 2 to 4 present a selection of site photographs taken during the fieldwork.

Figure 1 presents a site locality plan showing the borehole locations. Figures 2 to 4 present a selection of site photographs taken during the fieldwork.

Appendix A presents the engineering borehole logs.

Appendix B presents the piezometer construction records.

4. Geotechnical Laboratory Results

4.1 California Bearing Ratio (CBR) testing

Four (4) disturbed soil samples were recovered for CBR testing.

The following sample preparation was undertaken prior to CBR testing:

- Compact to 98% standard MDD, at optimum moisture content
- Four (4) day-soaked sample; and
- 4.5 kg surcharge.

Table 1 presents a summary of the CBR test results. The CBR test certificates are presented in Appendix C.

Table 1 - Summary of CBR Laboratory Test Results

Sample ID	Depth (m)	Material Description	Soaked CBR (%)	Optimum Moisture Content (%)	Standard Maximum Dry Density (t/m³)	Swell (%)
BH 01	0.2 - 0.8	CLAY	2.5*	19.6	1.73	0.5
BH 08	0.2 – 1.0	CLAY	1.0*	17.5	1.79	4.0
BH 11	0.2 – 1.0	CLAY	1.0**	17.8	1.77	3.5
BH 26	0.5 – 0.8	CLAY	3.5*	18.9	1.74	0.5

(*) Denotes soaked CBR value at 2.5mm penetration

(**) Denotes soaked CBR value at 5.0mm penetration

4.2 Atterberg Limits

Eight (8) disturbed soil samples were recovered for Atterberg Limit testing.

Table 2 presents a summary of the Atterberg Limits test results. The Atterberg Limits test certificates are presented in Appendix D.

Table 2 - Atterberg Limits Laboratory Test Results

Sample ID	Depth (m)	Material Description	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)
BH 01	0.2 – 0.8	CLAY	18.5	55	16	39	10.5*
BH 08	0.2 – 1.0	CLAY	20.2	50	17	33	10.5
BH 11	0.2 – 1.0	CLAY	18.6	56	16	40	13.0*
BH 13	0.2 – 0.8	CLAY	20.9	48	15	33	13.0
BH 20	0.5 – 1.0	CLAY	20.1	60	18	42	11.5**

Sample ID	Depth (m)	Material Description	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)
BH 21	0.5 – 1.0	CLAY	18.5	40	13	27	11.5*
BH 22	0.5 – 1.0	CLAY	24.4	61	17	44	15.0
BH 26	0.5 – 0.8	CLAY	19.0	53	15	38	15.0

(*) Denotes linear shrinkage curled

(**) Denotes linear shrinkage cracked

The linear shrinkage mould was 125mm

The test sample for liquid and plastic limit was air-dried & dry-sieved

4.3 Shrink-Swell Testing

Eight (8) undisturbed soil samples were collected using U50 tubes for shrink-swell tests.

Table 3 presents a summary of the shrink-swell test results. The shrink-swell test certificates are presented in Appendix E.

Sample ID	Depth (m)	Swell on Saturation (%)	Shrinkage (%)	Shrink-swell Index (%/pF)	Shrinkage Cracking
BH 03	0.5 – 0.9	0.0	2.8	1.5	Moderate
BH 05	0.5 – 0.9	3.8	3.5	3.02	Moderate
BH 07	0.5 – 0.9	2.8	3.0	2.45	Moderate
BH 10	0.5 – 0.9	0.0	1.4	0.78	Moderate
BH 14	0.5 – 0.9	0.7	1.9	1.25	Major
BH 17	0.5 – 1.0	1.3	4.4	2.82	Major crack centre of sample
BH 20	0.5 – 0.9	1.2	3.9	2.48	Moderate
BH 30	0.5 – 1.0	1.4	6.5	3.97	Moderate

Table 3 - Shrink-Swell Laboratory Test Results

4.4 Aggresivity and Salinity Testing

Four (4) disturbed soil samples were recovered for testing by a NATA accredited laboratory.

The following tests were undertaken on the disturbed samples:

- Field moisture content
- Soil pH
- Cation Exchange Capacity (CEC) of calcium, magnesium, potassium, and sodium
- Electrical conductivity at 25°C (one part of soil to five parts of water)
- Saturated resistivity at 25°C
- Chlorides
- Soluble sulfates.

Table 4 presents the summary of the laboratory testing. Appendix F presents the laboratory test certificates.

Sample		Electrical	Resistivity	tivity Moisture by Sufate h		Soluble Sufate by	Exchangeable Cations [meq/100g]					Exchangeable
ID (Depth)	рН	Conductivity [µS/cm]	[Ohm cm]	Content [%]	Discrete Analyser [mg/kg]	ICPAES	Analyser ICPAES Ca Mg	к	Na	CEC	Sodium Percent [%]	
BH02 (0.4 - 0.5m)	5.9	90	11100	15.9	370	110	0.7	6.7	0.2	1.3	8.9	15.0
BH12 (2.0 - 2.1m)	5.7	324	3090	9.3	440	80	<0.1	4.5	0.3	1.7	6.6	26.0
BH21 (2.8 - 3.0m)	9.6	457	2190	7.4	350	60	2.7	3.0	0.2	3.2	9.1	34.6
BH27 (0.3 - 0.5m)	5.3	326	3070	22.8	420	80	2.7	6.1	0.2	1.6	12.1	13.1

Table 4 - Salinity and Aggressivity Laboratory Testing Results

G3 56 Delhi Road North Ryde NSW 2113

+61-2 9812 5000

5.1 Geological Setting

Site Conditions

5.

The 1:100,000 Sydney Geological Map indicates that the site is underlain by:

• (Rwb) Bringelly Shale of the Wianamatta Group comprising of Shale, carbonaceous claystone, claystone, laminate, fine to medium grained sandstone, rare coal and tuff.

Inset 2 presents the geological map of the site.



Inset 2 - 1:100,000 Penrith Geological Map (approximate site boundaries in red)

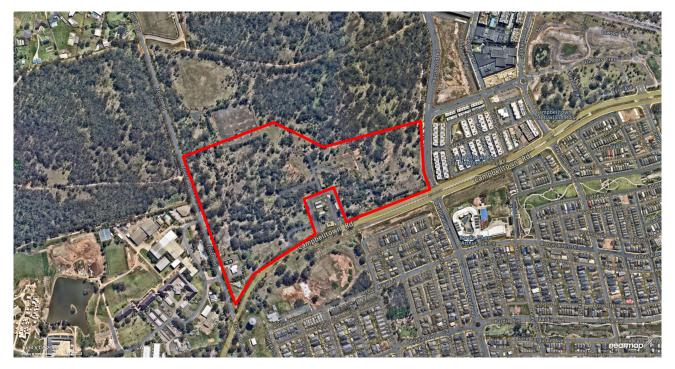
5.2 Surface Conditions

Based on the site walkover and available aerial photos, we understand the following regarding the Site:

- The Site was historically used as an army barracks until early 2010. The buildings were then demolished except for the Bardia Barracks which remain as part of a separate Lot
- No significant changes to the land use were observed from 2010 to present
- The existing site comprises:
 - Vegetated area (grass, shrubs and trees)
 - Building slabs and wall remnants from the old barracks
 - Paved road.

Inset 3 presents a recent nearmap image of the Site.

E mailbox@psm.com.au www.psm.com.au e site is underlain by:



Inset 3 - Nearmap aerial image in Oct 2022

5.3 Subsurface Conditions

The subsurface conditions encountered within the augered boreholes are summarised in Table 5. The approximate elevation of the top of the inferred geotechnical units at each test location are summarised in Table 6. Surface elevations at each borehole location have been estimated using the site survey plan provided to us.

Inferred Unit	Approximate Depth to Top of UnitSurface(m)	Description
TOPSOIL	0	Silty CLAY to Clayey SILT; non plastic to low plasticity, dark brown, dry to wet, soft to firm consistency, organic soil, contains rootlets
FILL	0	Localised on southeastern portion of the site Sandy GRAVEL to Gravelly SAND, medium dense, fine to medium grained sand, sub-angular gravel up to 30mm
NATURAL SOIL	0.05 to 0.4m	CLAY to Sandy Gravelly CLAY; medium to high plasticity, stiff to very stiff, moist (M>PL) to dry, red brown to yellow brown, fine to coarse grained sand, sub-angular gravel pieces up to 10mm,
BEDROCK	1.7 to 4.0	SHALE; brownish grey to dark grey, extremely to highly weathered, very low to low strength

 Table 6 - Approximate Reduced Level (RL) of the Top of Inferred Subsurface Conditions Encountered in Borehole Locations

Testing Location ID		te Reduced Level of I	nferred Top of Geo			
	FILL	TOPSOIL	SOIL	BEDROCK	EOH	
BH01	N.E	66.8	66.7	65	62.1	
BH02	N.E	65.9	65.7	64	63.4	
BH03	N.E	68.4	68.2	65.8	63.7	
BH04	N.E	73.8	73.8	71.4	68.8	
BH05	N.E	73.3	73.2	71.8	68.3	
BH06	N.E	69.8	69.7	67.3	64.8	
BH07	N.E	66.8	66.7	64.6	61.8	
BH08	69.6	N.E	69.6	66.5	64.6	
BH09	N.E	74.4	74.4	72.1	69.4	
BH10	68.8	N.E	68.7	66.0	63.8	
BH11	N.E	70.1	70	68.3	65.1	
BH12	N.E	71.8	71.6	69.8	66.8	
BH13	N.E	75.5	75.5	73.8	70.5	
BH14	N.E	73.3	73.2	69.8	68.3	
BH15	N.E	68.3	68.0	66.5	58.3	
BH16	N.E	70	69.7	66.3	65	
BH17	N.E	69.5	69.4	67.1	64.5	
BH18	N.E	74.3	74.1	71.9	69.3	
BH19	N.E	74.6	74.5	72.6	69.6	
BH20	N.E	78.6	78.4	75.8	73.6	
BH21	N.E	79	78.8	76	74	
BH22	N.E	76	75.8	73.5	71	
BH23	N.E	72	71.9	68	67	
BH24	N.E	76.2	76	74.7	73.6	
BH25	N.E	79.5	79.4	77.8	74.5	
BH26	N.E	78.8	78.5	77	73.8	
BH27	N.E	81.1	80.9	78.6	76.1	
BH28	N.E	76	75.6	74.2	73.7	
BH29	N.E	78.8	78.7	76	66.8	
BH30	N.E	80.6	80.4	78.2	68.6	

EOH = End of Hole

N.E = Not Encountered

5.4 Groundwater

Table 7 presents a summary of the encountered groundwater level measured by manually dipping the installed piezometers.

BHID	BH installation date	Date of observation	Depth of groundwater (mbgl)	Approximate Groundwater table RL (m AHD)
BH15	20/10/2022	21/10/2022	4.6	63.7
BH29	18/10/2022	21/10/2022	8.8	67.2
BH30	17/10/2022	21/10/2022	6.9	73.7

Table 7 - Summary of Groundwater Level Observations

6. Salinity and Aggressivity Assessment

6.1 Soil Chemistry

The laboratory test results summarized in Table 3 indicate the following:

- pH of the soil samples analysed was in the range of 5.3 to 9.6
- The 1:5 soil to water extraction and subsequent electrical conductivity (EC_{1:5}) of the soil samples analysed o be in the range of 90 to 457 μ S/cm
- Resistivity of soil samples to be in the range of 2190 to 11100 ohm cm
- Concentrations of chlorides in samples analysed to be 350 to 440 mg/kg
- Concentrations of sulphate in samples to be in the range of 60 to 110 mg/kg
- Cation Exchange Capacity (CEC) in samples analysed was in the range of 6.6 to 12.1 meq/100g
- Exchangeable Sodium Percentage (ESP) in samples analysed was in the range of 13.1 to 34.6%.

6.2 Salinity

Site Investigations for Urban Salinity (DLWC 2002) classify soil salinity based on electrical conductivity (ECe) as per Richards (1954). The method of conversion from $EC_{1:5}$ to EC_e (electrical conductivity of saturated extract) is based on DLWC (2002) and given by $EC_e = EC_{1:5} \times M$, where M is the multiplication factor based on "Soil Texture Group".

The "Soil Texture Group" of the samples tested has been assessed during our investigation. The salinity classification for the soil samples that were tested are presented in Table 8.

Sample ID	EC _{1:5} (dS/m)	SOIL TYPE	М	Ece (dS/m)	Salinity Class
BH02	90	Medium CLAY	7	0.63	Non-saline
BH12	324	Light CLAY	8.5	2.754	Slightly saline
BH21	457	Light CLAY	8.5	3.885	Slightly saline
BH27	326	Medium CLAY	7	2.282	Slightly saline

Table 8 - Salinity Classification

It is assessed that the soils on this site are classified as "non-saline" to "slightly saline".

We have referred to Clause 4.8.2 of Australian Standard AS3600-2018 "Concrete Structures" and note that the assessed soil electrical conductivity (Ece) is within the exposure classification of "A2".

6.3 Corrosivity

Table 4.8.1 of AS3600-2009 "Concrete Structures" provides criteria for exposure classification for concrete in sulphate soils based on sulphates in soil and groundwater, and pH of soil. On the basis of the sulphate and pH testing completed, we assess the exposure classification for concrete in sulphate soils to be A1.

Similarly, Table 6.4.2(C) of Australian Standard AS2159:2009, Piling – Design and Installation provides criteria for exposure classification for concrete piles in soil, and here the exposure classification for concrete piles in soil is non-aggressive.

Table 6.5.2(C) of Australian Standard AS2159:2009, Piling – Design and Installation provides criteria for exposure classification for steel piles based on resistivity, soil and groundwater pH, and chlorides in soil and groundwater. On the basis of the resistivity, pH and chloride testing completed we assess the exposure classification for steel piles in the soil to be non-aggressive.

6.4 Sodicity

Sodicity provides a measure of the likely dispersion on wetting and to shrink/swell properties of a soil. Soil sodicity is classified based on the Exchangeable Sodium Percentage (ESP) which is the amount of exchangeable sodium as a percentage of the Cation Exchange Capacity (DLWC, 2002).

The Exchangeable Sodium Percentages calculated from these laboratory results, ranging from 13.1% to 34.6%, indicates that the soils on site range from sodic to highly sodic when compared to criteria listed in "Site Investigations for Urban Salinity", DLWC (2002).

7. Earthworks

A separate bulk earthworks specification has been prepared (ref. PSM4815-005S) which clearly sets out the roles and responsibilities of the earthworks contractor and its Geotechnical Inspection and Testing Authority (GITA). The Specification complies with the intent of AS 3798-2007 "Guidelines on earthworks for commercial and residential developments".

Our specification generally comprises more stringent requirements (e.g., lot testing, more survey, etc.). It reduces risk of poor earthworks performance. We note however depending on the actual consent conditions of the proposed subdivision and the Council requirements, the proposed earthworks could have other requirements. Upon confirmation of the Consent Conditions, we can update PSM specification to meet both consent conditions and our design advice if requested.

8. Interim Geotechnical Design Advice

8.1 General

The interim Geotechnical Design advice (IGDA) provided in the following sections has been prepared on the following basis:

- The subsurface conditions are as described in Section 5
- The earthworks will be undertaken in accordance with the PSM bulk earthworks specification PSM4815-005S.

It is PSM's opinion that it should be the builder's responsibility to maintain the condition of the pad after the handover date and accept the risk that comes with modifying excavation levels and weather. There should be a strict transfer of the risk. We recommend that building tenderers be required to indicate how they intend to manage this risk.

8.2 Site Classification

It is understood that the proposed development is a residential subdivision and would therefore be within the scope of Australian Standard AS2870-2011¹ "Residential slabs and footings".

We advise the following:

- 1. In cut areas within the NATURAL SOIL unit, structures that are within the scope of AS2870-2011 be designed for a site classification of Class "H1" in accordance with Table 2.1 of AS2870-2011.
- 2. In fill areas, further assessment of the site classification would be required and will depend on the fill materials, depth of fill and the manner in which it was placed.
 - a. Where existing fill is present and there is no earthworks documentation (records), the fill cannot be considered as "controlled fill" and thus the site is classified as Class P in accordance with AS2870-2011. Further detailed investigation and assessment should be undertaken to allow for reclassification. Alternatively, it may be simpler and more cost effective to remove the existing fill to natural soil.
 - b. Where new fill will be placed in accordance with PSM bulk earthworks specification (Ref. PSM4815-005S), the site can be reclassified from Class P to Class H2, provided the following are satisfied:
 - i. The fill is placed strictly in accordance with PSM bulk earthworks specification.
 - ii. PSM undertake review of the GITA weekly reports, interim / final certificates as described in the earthworks specification.
 - iii. PSM undertake inspection during and at the completion of the bulk earthworks.

The civil and structural engineers should consider likely heave / settlement due to the effect of climatic factors in their designs.

We recommend that all structures and services be detailed such that they preclude any local wetting up or drying out of the subgrade after initial equilibrium is reached following construction of the slab and that the subgrade be within Specification at the time of construction of the slab. We note that normal mounding or sagging away from the perimeter of covered areas will still occur and perimeters, or open joints, will still respond to environmental changes.

8.3 Foundations

8.3.1 Shallow Foundation

It is expected that the foundations used as part of any proposed development at the site would typically include strip, pad or other shallow footings.

Pad footings can be proportioned on the basis of an allowable bearing pressure (ABP) for centric vertical loads provided in Table 9.

We note that an allowable bearing pressure (ABP) is not a soil property. It depends on many factors such as the size of the footings, the embedment depth, the load direction and eccentricity, the stiffness of the footing, the adopted factor of safety (FOS), as well as the soil properties. As footings get bigger or deeper the capacity increases rapidly, and as the load gains eccentricity or becomes inclined, the capacity reduces rapidly.

When assessing the settlement of the shallow footings, the designer needs to consider the additional ground settlement due to the total building load on both shallow and deeper units. The differential settlement due to the building load shall also be assessed. Foundation conditions at the proposed shallow pad footing should be inspected by a suitably qualified geotechnical engineer prior to the pouring of concrete.

¹ Standards Australia (2011) Residential slabs and footings, AS 2870-2011, Standards Australia, NSW.

Table 9 - Foundation Parameters of the inferred Geotechnical Units

	Bulk unit weight	Soil effe strength paramet]	Ultimate bearing pressure under vertical	Allowable bearing pressure under vertical	Ultimate Shaft	Elastic parar	neters
	(kN/m³)	c' (kPa)	<i>φ'</i> (de g)	centric loading ² (kPa)	centric loading ³ (kPa)	Adhesio n (kPa)	Young's Modulus (MPa)	Poisson's Ratio
ENGINEER ED FILL, NATURAL SOIL	18	0	30	420 ¹	150	N/A	10	0.3
BEDROCK	22	10	30	3000	700	100	100	0.25

¹ Pad footings in soil unit should have a minimum horizontal dimension of 1.0 m and a minimum embedment depth of 0.5 m.

² Ultimate bearing pressure values occur at large settlement (>5% of minimum footing)

³ Allowable bearing pressure to cause settlement of <1% of minimum footing

8.3.2 Piles

Piled foundations should be within the BEDROCK units.

Piles should be designed in accordance with the requirements in AS 2159 (2009), *Piling – Design and Installation*. The parameters provided in Table 9 may be adopted in the design of piles founded in the BEDROCK units.

The foundation designer should note the following with regards to the pile design:

- The ABP needs to be confirmed by a geotechnical engineer through pile inspections prior to pouring concrete
- Under permanent load, the contribution of side adhesion for soil units should be ignored
- Pile settlement can be checked using the recommended elastic parameters in Table 9
- Where adjacent foundation details differ (e.g., pile and pad, differing loads or ground conditions), differential settlement should also be assessed.

The rock is expected to increase in strength with depth such that higher bearing capacities than those provided in Table 9 should be achievable at depth. If this is required, further advice should be sought from PSM.

With regards to the pile design, we recommend that:

- A basic geotechnical strength reduction factor, Φgb = 0.56 (AS2159 CL. 4.3.2) be adopted for a high redundancy system for an assessed average risk rating (ARR) between 3.0 and 3.5. This should be reviewed to suit the specific design and appropriate pile testing proposed by the structural / pile designers in accordance with the requirements of AS2159
- It may be possible to increase the pile reduction factors, if the details of the proposed pile installation procedures indicate a high level of quality control with regards to concrete placement, base cleanliness, etc
- If a geotechnical strength reduction factor, Φg = 0.40 is adopted then no pile testing will be required (AS2159 Clause 8.2.4 (b)).

Where the pile is sized using the allowable bearing capacity in Table 9. (i.e., assuming all the serviceability load is carried by the base), the settlement would be expected to be less than 1% of the pile diameter plus elastic shortening of the pile itself.

8.4 **Permanent and Temporary Batters**

The batter slope angles shown in Table 10 are recommended for the design of batters up to 3m height and above the groundwater, subject to the following recommendations:

- All batters shall be protected from erosion
- Permanent batters shall be drained
- Temporary batters shall not be left unsupported for more than 2 months without further advice, and inspection by a geotechnical engineer should be undertaken following significant rain events
- No buildings, loads or services should be located within 1 batter height of the crest.

If the conditions above cannot be met, further advice should be sought.

Table 10 - Batter Slope Angles

Unit	Temporary	Permanent		
ENGINEERED FILL / NATURAL SOIL	2.0H : 1V	2.5H : 1V		
BEDROCK	1.0H :1V	1.5H : 1V		

Steeper batters or vertical cuts (in bedrock) may be possible subject to further advice. This could include the requirement for soil nails or rock bolts. The length and spacing of soil nail and rock bolts is a matter of design.

The batters should be inspected by an experienced geotechnical engineer or engineering geologist during excavation to confirm the batter advice provided and assess the need for localised support.

Proper and suitable safe work method statements and OHS documents need to be developed for works to be undertaken in the vicinity of the crest and toe of batters.

8.5 Slabs

The design of slabs on ground can be based on a subgrade with a long - term Young's Modulus in Table 1.

We note that the environmental effects (e.g. drying or wetting up of the finished surface) affecting the land prior to development should be taken into account by the various designers of the proposed development.

We note that the final bulk earthworks subgrade will require proof rolling and plate load testing to confirm the properties provided and may require some boxing out and refilling, etc.

8.6 Pavement Design

CBR tests undertaken by PSM in the geotechnical investigation indicate a CBR value ranging from 1.0% to 3.5%. The low CBR value is due to swelling of the samples after fully soaked.

We advise that a design subgrade CBR of 1.5% be adopted for earthworks completed in accordance with PSM specification. Higher values may be provided on completion of testing on the finished bulk earthworks or if, on request, the Specification is varied to obtain such higher values on fill.

We recommend that specific CBR testing be undertaken at pavement subgrade level when pavement layouts are finalised. CBR testing shall be undertaken for any new imported material within the pavement subgrade (e.g., within 1 m below pavement).

Yours Sincerely



ROHAN STOCKER SENIOR GEOTECHNICAL ENGINEER

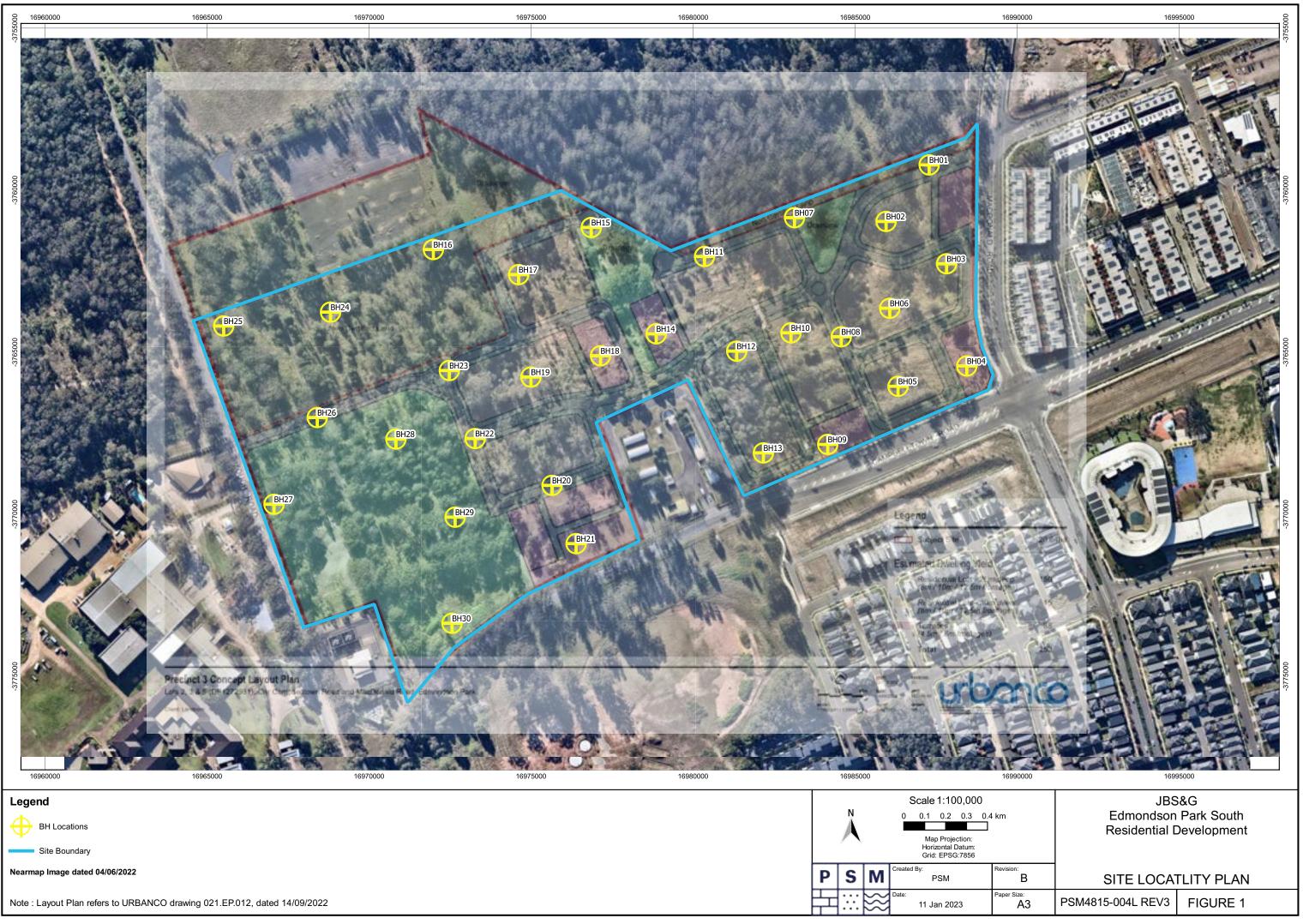


DENNIS LIM GEOTECHNICAL ENGINEER

DAVID PICCOLO PRINCIPAL

Encl.

Figure 1 Site Locality Plan Figure 2 to 6 Selected Site Photographs Engineering Borehole Logs Appendix A **Piezometer Construction Records** Appendix B Appendix C **CBR Test Results** Appendix D Atterberg Limits Test Results Appendix E Shrink Swell Test Results Appendix F Salinity and Aggressivity Test Results



C:\Users\Dennis.Lim\Pells Sullivan Meynink\GIS - ArcGIS\PSM4815 Edmondson Park\02_WorkSpace\01_MXDs\PSM4815.qgs Layout: A3_PSMLand



Photo 1 : General site photo near BH22, facing West (17 October 2022)



Photo 2 : General site photo near BH22, facing south (17 October 2022)

JBS&G Edmondson Park South **Residential Development** SELECTED SITE PHOTOGRAPHS (1 of 5) FIGURE 2 PSM4815-004L REV3



Photo 3 : General site photo near BH06, facing north (21 October 2022)



JBS&G Edmondson Park South Residential Development SELECTED SITE PHOTOGRAPHS (2 of 5) PSM4815-004L REV3 FIGURE 3



Photo 5 : Typical soil cutting profile (BH14)



Photo 6 : Typical soil cutting profile (BH17)

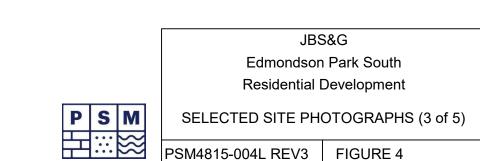




Photo 7 : Typical Natural Clay Sample



JBS&G Edmondson Park South Residential Development SELECTED SITE PHOTOGRAPHS (4 of 5) PSM4815-004L REV3 FIGURE 5



Photo 9 : 5.5t track mounted drill rig typical setup



Photo 10 : Typical piezometer installation process

	JBS&G											
	Edmondson Park South											
	Residential Development											
P S M	SELECTED SITE PH	OTOGRAPHS (5 of 5)										
	PSM4815-004L REV3 FIGURE 6											
aure rev vlsvIA4 Portrait												

Appendix A Engineering Borehole Logs

Ρ	S	Μ
H		}}}

BH01

Er	ngineering Log - Borehole										Project No.: PSM48						i
	Client Proje		ame	JBS&0		Deve		ent F	dmon	lson Park South	Comme					/202 /202	
F	lole	Loca	tion	: Edmoi	ndso	n Par	k Sout	h, NS	W		Logged By: DL					-	
	lole				-					83.3 m N MGA2020 Zone 56							
	orill N Iole			d Mounting: r:		mmao) mm	chio G	EO 30	05	Inclination: -90° Bearing:	RL Surf Datum:	ace:	66 AF	.80 ID	m	0	perator: Matrix Drilling
			Dril	ling Informa	tion					Soil Descri	otion						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Pen	Pock etror UCS (kPa	netei S I)	r Structure and Additional Observations
								Ň'nŇŕ	OL	TOPSOIL; Silty CLAY, low plastici	ty, dark	M	S	0 2		50 4 0	0.00: Inferred TOPSOIL, grassed surfa 0.10: Inferred NATURAL SOIL
		 		B 0.20-1.00 m			-		СН	brown CLAY, high plasticity, red brown			F				
AD/V		 z		2, 4, 5 N = 9		ω	-			becomes pale grey		M (>PL					
						65.8	1						St				
		1		SPT 1.50 m 10, 13/120mm								M (<pl< td=""><td>VSt</td><td></td><td></td><td></td><td>1.55: V-bit refusal</td></pl<>	VSt				1.55: V-bit refusal
			Encountered	N = R		64.8	2			SHALE; pale grey, extremely wea low strength	thered, very						1.80: Inferred BEDROCK, observed fr SPT sample, strength and weathering inferred from drilling resistance and cuttings
AU/I		Ν	Not			 62.8 63.8						D					
		 				61.8	5			TC-bit refusal Hole Terminated at 4.70 m							
						60.8											
R		Meth Auger Rock	Scre	ewing	rang	tion sistand ing to fusal	[⊻ Le > Inf ⊲ Pa	Vater vel (Dat low intial Los omplete	SPT - Standard Penetra s	ple	<u> </u>	W	- [- N - \	Dry Moist Vet	t	Consistency/Relative Densi VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
Support Graphic Log/Core L C - Core recovered (t C - Core recovered (t C - Core loss					red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	tions			stic < P = P < P	L	Ľ	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense			

Ρ	S	Μ
H		**

BH02

En	ngiı	ne	er	ing	g Log - B	or	ehc	ole				Project	No.:		PS	M48	315	
P H	Clien Proje Iole Iole	ct N Loc	ati	on:	Edmono	lsoi	n Par	k Sout	h, NS	W	son Park South 32.0 m N MGA2020 Zone 56	Comme Comple Logged Checke	eted: By:					
	Drill Model and Mounting: Commachio GEO 305 Inclination: Hole Diameter: Bearing:									RL Surfa Datum:		65 Al-	.90 r	n	0	perator: Matrix Drilling		
					ng Informati	on					Soil Descrip			7.1				Observations
Method	Penetration		Juoddne	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	Pene l (ocke etrom JCS kPa)	eter	Structure and Additional Observations
AU/V				lot Encountered	ES 0.40-0.50 m SPT 0.50 m 4, 7, 8 N = 15		64.9	- - - 1 -		OL CI-CH	TOPSOIL; Silty CLAY, non plastic, brown, organic soil CLAY; medium plasticity, red brow becomes high plasticity, pale grey		м (>PL)	F				0.00: Inferred TOPSOIL; grassed surfa
AUI					SPT 1.50 m 7, 8, 12 N = 20		63.9	2 2 			SHALE; dark grey and brown, extr weathered, low strength TC-bit refusal Hole Terminated at 2.50 m	emely	D					1.90: Inferred BEDROCK from SPT sample, strength and weathering infer from drilling resistance and cutting 2.00: V-bit refusal
							1 1 61.9 62.9	3										
							6.09	5-										
							59.9											
							58.9	- 7										
ARV	RR - Rock Roller D ranging to D							D - Disturbed Sample SPT - Standard Penetra s	ple	<u> </u>	M	<u>re Co</u> - D - N - W stic L	ry loist /et		Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose			
	Support Graphic Log/Core L C - Casing Core recovered (I) C - Casing Core loss				red (ha		<u>Classification Syr</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			< PL = PL < PL	-		L - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

Borehole No.

BH03

C P F	Ingineering Log - BoreholeClient:JBS&GProject Name:Residential Development, Edmondson Park SouthHole Location:Edmondson Park South, NSWHole Position:See Figure 1 301908.8 m E 6238695.8 m N MGA2020 Zone 56											No.: nced: ted: By: d By:		19		22
	Drill M Hole D			d Mounting:	Со	mmao	chio G	EO 30)5	Inclination: -90° Bearing:	RL Surfa Datum:				m (Operator: Matrix Drilling
				ing Informati	ion					Soil Descri						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Pene	ocket etromet UCS kPa)	Additional Observations
			ered	U50 0.50-0.90 m 2, 7, 8 N = 15 SPT 2.00 m 8, 12, 18/115mm N = R		64.4 65.4 66.4 67.4			OL CH	TOPSOIL; Silty CLAY, low plastic brown, organic soil CLAY; high plasticity, red brown becomes CLAY trace gravel, sub- gravel up to 5mm becomes CLAY, yellow brown with mottling becomes pale grey SHALE; brownish grey, extremely very low strength becomes pale grey, highly weather	angular n pale gray weathered,	M (>PL)	S	1		 5 0.00: Inferred TOPSOIL, grassed surface, rootlets observed to D=0.2m 0.20: Inferred NATURAL SOIL 2.40: V-bit refusal 2.60: Inferred BEDROCK, strength an weathering inferred from drilling resistance and cuttings
						61.4 62.4 63.4				TC-bit refusal Hole Terminated at 4.70 m						
ARV	Method Penetration Water AS - Auger Screwing RR - Rock Roller WB- Washbore No resistance ranging to refusal ✓ Level (Date) No resistance ranging to refusal ✓ Partial Loss Complete Logs ✓ Complete Loss Core recovered (hatching indicates material) Core loss						SPT - Standard Penetra s	mple D - Dry le M - Moist ration Test W - Wet <u>Plastic Limit</u> <u>mbols</u> < PL <u>otions</u> = PL d Soil < PL			- D - N - V s <i>tic L</i> < Pl = Pl	m <u>Consistency/Relative Densi</u> VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

BH04

	lient			JBS		enc	Ле				Project I				SM4		
	Projec		ame			l Deve	elopme	ent, E	dmonc	son Park South	Comme Complet				/10/ /10/		
	lole l						k Sout				Logged	-		DL			
					-					05.3 m N MGA2020 Zone 56 Inclination: -90°	Checked		70	RS			
	lole I			d Mounting r:		mma	chio G	EO 31	5	Inclination: -90° Bearing:	Datum:	ace.	73 AF	.80 ID	m	0	perator: Matrix Drilling
			Dril	ling Inform	ation					Soil Descri	ption						Observations
	Penetration	Support	Water	Samples Tests Remarks		RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi	Bedding,	Moisture Condition	Consistency Relative Density	F Pend	Pocke etron UCS (kPa)	neter)	Structure and Additional Observations
								Ϋ́́́́́	OL	TOPSOIL; Silty CLAY, dark brown	ı, organic		S				0.00: Inferred TOPSOIL, grassed surface, observered rootlets up to
				SPT 0.50 m 2, 4, 6 N = 10			-		СН	CLAY; high plasticity, red brown		/ (>PL)	F				D=0.1m 0.50: Inferred NATURAL SOIL
				10 - 10		72.8	1			becomes CLAY, yellow brown wit mottling	h pale grey	(** ב)	St				
			ğ	SPT 1.50 m 8, 12, 10/50 N = R		71.8	2-			becomes Gravelly CLAY, sub-ang up to 10mm becomes CLAY, pale grey	jular gravel	M (<pl)< td=""><td></td><td></td><td></td><td></td><td></td></pl)<>					
			Not Encountered			71	_			becomes yellow brown			VSt				
			Not End			1 70.8	3-			SHALE; pale grey, extremely wea low to low strength	thered, very						2.40: V-bit refusal. Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
						 69.8	- - 4					D					
						8.8											
		 				68	-			Target depth Hole Terminated at 5.00 m							
						 67.8	6										
						66.8	7										
R	-	Meth Auger Rock	Scre	ewing	⊿ ran	<u>tion</u> esistano ging to fusal		⊻ Le > Inf ⊲ Pa	rtial Los	SPT - Standard Penetra s	nple e	<u> </u>	M	- [Dry Moist		Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
Method Penetration AS - Auger Screwing No resistance ranging to refusal RR - Rock Roller refusal WB- Washbore Core recovere indicates mate Support Core recovere core core loss				ore Loss Classification Symbol			tions = PL Soil < PL						Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

BH05

Eng	igineering Log - Borehole										Project No.: PSM48						5
Clie Proj Hole Hole	ject e Lo	ocat	tion:	Edmo	entia ndso	n Parl	k Sout	h, NS	W	son Park South 88.4 m N MGA2020 Zone 56	Comp Logge	menced: pleted: ed By: ked By:			/10/	/202 /202	
Drill Hole				d Mounting:	Co	mmad	chio G	EO 30)5	Inclination: -90° Bearing:		urface:	73 AH	.30 I	m	0	perator: Matrix Drilling
TIOR	eD			ing Informa	tion					Soil Descrip			AI				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	/erv	, RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding,	Moisture Condition	Consistency Relative Density	Pene	UCS (kPa	nete S	r Structure and Additional Observations
ADV				U50 0.50-0.90 m			-	· / · · · / ·	CH	TOPSOIL; Sandy Silty CLAY, low dark brown, organic soil CLAY; high plasticity, red brown	lasticity,		_F_ St	÷c	Ň	2 4	0.00: 30mm gap graded loose Gravel SAND. Inferred TOPSOIL 0.08: Inferred NATURAL SOIL
1				SPT 0.90 m 6, 16, 13 N = 29		72.3	1			becomes pale grey		M (<pl)< td=""><td>н</td><td></td><td></td><td></td><td></td></pl)<>	н				
			Not Encountered			71.3	2			SHALE; brownish grey, exteremel weathered, very low strength							1.55: V-bit refusal Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
			Not E			70.3	3-			becomes SHALE, pale grey, extre highly weathered, low strength	nely to	D					
						69.3	4										
						68.3	5			Target depth Hole Terminated at 5.00 m							
						67.3	6-										
						66.3	7										
	<u>M</u> - Au - Ro	ock F		wina 🖂	ranc	tion sistanc jing to fusal	[-	⊻ Le > Infl ⊲ Pa	Vater vel (Dat low rtial Los mplete	SPT - Standard Penetra s	nple D - Dry le M - Moist					t	Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
Method Penetration M AS - Auger Screwing RR - Rock Roller WB- Washbore No resistance ranging to refusal Lev Par Support C - Casing Core recovered (hat indicates material)						<u>Classification Symbols</u> <u>and Soil Descriptions</u> Based on Unified Soil Classification System				stic I < Pi = Pi < Pi	L	Ţ	VI - Very Loose VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

BH06

En	ngin	nee	rin	g Log	- Boi	reho	ole				Project I	No.:		PS	M48	315	
P H	Client Projec Hole L Hole F	ct Na _oca	tion	: Edm	identia iondso	n Par	k Sout	h, NS	W	son Park South 53.5 m N MGA2020 Zone 56	Comme Comple Logged Checke	ted: By:					
				d Mounting	-					Inclination: -90°	RL Surfa		69	.80 n			
ŀ	lole [Dian	nete	r:						Bearing:	Datum:		Ał	HD		Op	perator: Matrix Drilling
			Dril	ling Inforn	nation	T			1	Soil Descrij	otion						Observations
Method	Penetration	Support	Water	Sample Tests Remark	/erv	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Pene L (I	ockel trom JCS kPa)	eter	Structure and Additional Observations
				SPT 0.50 m 3, 5, 7 N = 12	1	68.8	- - - 1_		4	TOPSOIL; Silty Sandy CLAY, low dark brown, organic soil CLAY; medium plasticity, red brown becomes high plasticity, red brown	'n	M (>PL)	St				0.00: Inferred TOPSOIL, grassed surfa 0.08: Inferred NATURAL SOIL
AD/V			ered	SPT 1.50 n 7, 11, 13 N = 24		67.8 68	- - - 2-			grey mottling becomes pale grey		M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td>2.00: V-bit refusal</td></pl)<>	VSt				2.00: V-bit refusal
			Not Encountered	SPT 3.00 m 5, 16, 1/140 N = R		66.8				SHALE; brownish grey, extremely very low strength becomes, pale grey, extremely to weathered, very low to low streng	nighly	-					2.50: Inferred BEDROCK, strength an weathering inferred from drilling resistance and cuttings
AD/T						65.8						D					
		 				64.8				Target depth Hole Terminated at 5.00 m							
						63.8	- 6 -										
						62.8											
R		Meth Nuger Rock	Scre Rolle	ewing	🛛 rang	<u>tion</u> esistanc ging to fusal	[⊻ Le > Inf ⊲ Pa	<u>Vater</u> vel (Dat low irtial Los omplete	SPT - Standard Penetra s	ple	<u> </u>	M	- D - M / - W	ry loist /et	on	Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
	_	Supp - Ca		I	<u>Gi</u>	Core	Log/Co recove ates ma loss	red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			<u>stic L</u> < PL = PL < PL	-		VL - Very Dosse L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH07

Engineering	g Log - Borehole		Project No.: F	PSM4815
Client: Project Name: Hole Location: Hole Position:	Edmondson Park Sou	ent, Edmondson Park South th, NSW) m E 6238736.6 m N MGA2020 Zone 56	Completed: 1 Logged By: D	19/10/2022 19/10/2022 DL RS
Drill Model and Hole Diameter:	•	EO 305 Inclination: -90° Bearing:	RL Surface: 66.75 Datum: AHD	
	ing Information	Soil Descript		Observations
Method Penetration Support Water	Samples Tests Remarks & RL & Depth	D D D D D D D D D D D D D D D D D D D	oisture onditure anditive Density bad	Pocket enetrometer Structure and UCS Additional Observations (kPa)
	U 0.50-0.90 m SPT 0.90 m 5, 8, 19 N = 28	TOPSOIL; low plasticity, dark brown CH CLAY; high plasticity, red brown becomes red brown with pale grey r	, organic WS St (>PL)	8 8 8 0.00: Inferred TOPSOIL, grassed surface, rootlets observed up to D=0 0.10: Inferred NATURAL SOIL
Not Encountered	- % 2-	becomes extremely weathered, very low strength SHALE; brownish grey, residual, very		2.00: V-bit refusal 2.20: Inferred BEDROCK, strength a weathering inferred from drilling resistance and cuttings
		becomes grey, highly weathered, ic strength	D	
		Target depth Hole Terminated at 5.00 m		
Method AS - Auger Screv RR - Rock Roller WB- Washbore	ranging to	Water Samples and Tes ✓ Level (Date) U - Undisturbed Sample > Inflow D - Disturbed Sample < Partial Loss	e D - M - M - W - Plastic	Condition Consistency/Relative Dens - Dry VS - Very Soft - Moist S - Soft - Wet F - Firm VSt - Very Stiff H - Hard H - Hard Fr - Friable VL - Very Loose
<u>Support</u> C - Casing		red (hatching and Soil Description	ons =	PL L - Loôse PL MD - Medium Dense PL D - Dense VD - Very Dense

Ρ	S	Μ
		}}

BH08

Er	ngin	ee	rin	g Log - E	Bor	ehc	ole				Project N	No.:		PS	SM4	815	Fage I OI I
F H	Client: Projec Iole L Iole F	t Na .oca	tion	: Edmon	ntial dsoi	n Parl	k Sout	h, NS	W	son Park South 31.1 m N MGA2020 Zone 56	Commen Complet Logged Checked	ted: By:					
)rill M Iole D			d Mounting:	Co	mmad	chio Gl	EO 3	05	Inclination: -90°	RL Surfa Datum:	ace:	69 AH	.60	m	0	norotor: Motrix Drilling
-				ling Informati	on					Bearing: Soil Descrip			Ar	U		0	perator: Matrix Drilling Observations
Method	Penetration	Support		Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, Be Plasticity, Sensitivity, Additi	edding	Moisture Condition	Consistency Relative Density	Pen	Pocke etron UCS (kPa)	neter)	
				B 0.20-1.00 m SPT 0.50 m 3, 7, 12 N = 19			-		GP CH	Sandy GRAVEL, medium dense, g sub-agular up to 30mm CLAY, high plastcity, red brown	ap graded,	M (>PL)	<u>MD</u>	10	200	20	0.00: Inferred FILL 0.05: Inferred NATURAL SOIL
			Not Encountered	SPT 1.50 m 7, 12, 11 N = 23		67.6 68.6	1— - - 2— -			becomes yellow brown		M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt				
			Not End			 66.6	3-			SHALE; dark grey, highly weathere strength		D					3.10: V-bit refusal Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
						64.6 65.6	4			Target depth							
						63.6	- - - 6			Hole Terminated at 5.00 m							
						– 62.6	7										
R	<u> </u> S - A R - R VB- W	letho uger ock l	Scre Rolle		lo re rang	t <u>ion</u> sistano ing to usal		⊻ Le > Inf ⊲ Pa	<i>Vater</i> vel (Dat low artial Los omplete	SPT - Standard Penetrat	ble	<u>Λ</u>	M W	- [- N - \	Dry Moist Vet		Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
	_	<u>ирро</u> - Са			<u>Gr</u>	Core	Log/Co recover ates mat loss	ed (ha		<u>Classification Sym</u> <u>and Soil Descript</u> Based on Unified Classification Syst	<u>ions</u> Soil			stic < P = P < P	L		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

Borehole No.

		\sim														BH09
			2											L		Page 1 of 1
Engine	eer	'n	g Log - B	or	eho	ole				Project	No.:		PS	M4	815	5
Client: Project Hole Lo Hole Po	ocat	ion:	Edmond	lsoi	n Par	k Sout	th, NS	W	lson Park South 34.1 m N MGA2020 Zone 56	Commo Comple Logged Checke	eted: I By:			/10/	/202 /202	
Drill Mo Hole Di			Mounting:	Co	mma	chio G	EO 3	05	Inclination: -90° Bearing:	RL Sur Datum:		74 AH	.40 r -10	n	0	operator: Matrix Drilling
			ing Informatio						Soil Descri			7.1				Observations
			J									sity				
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Ū	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit		Moisture Condition	Consistency Relative Density	Pene l	JCS kPa	nete S ı)	Additional Observations
						-	<u> </u>	OL	TOPSOIL; Gravelly Silty CLAY, low dark brown	w plasticity,	м	s				0.00: Inferred TOPSOIL, grassed surface 0.05: Inferred NATURAL SOIL
AD/V			SPT 0.50 m 3, 3, 6 N = 9		 73.4			СН	CLAY; high plasticity, red brown		M (>PL)	F				
		Not Encountered	SPT 1.50 m 5, 10, 6/20mm N = R		1 72.4	2-			becomes yellow brown becomes yellow brown with pale g		M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt				
00112019-03-06 ADIT		Not End			 71.4	3			SHALE; brownish grey, extremely very low to low strength	weathered.	D					2.35: V-bit refusal Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
Lb: PSM 3.02.1.2019-03-06 Pf; PSM					9.4 70.4	4										
2022 1541 10.03.00.09 Dangal Fenos and Map Tool (Lb. PSM 3.02.1 2019-03-06 Pg PSM 3.02.1 2019-03-06 2022 1541 10.03.00.09 Dangal Fenos and Map Tool (Lb. PSM 3.02.1 2019-03-06 Pg PSM 3.02.1 2019-03-06 202					68.4 69	6			Target depth Hole Terminated at 5.00 m							

	Project Hole L	t Na			ntia					son Park South	Commer Complet Logged	ed:)/10	/202	
	Hole P	ositi	ion:	See Fig	gure	1 30	1810.6	δmΕ	62385	34.1 m N MGA2020 Zone 56	Checked	d By:		R	S		
	Drill Mo Hole D			d Mounting: :	Co	mmao	chio G	EO 30)5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	74 A⊦	.40 ID	m	C	Operator: Matrix Drilling
		I	Drill	ing Informati	ion					Soil Descrip	otion						Observations
14-44-04	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Additi	edding, ional	Moisture Condition	Consistency Relative Density	Pen	UCS (kPa	mete S	Additional Observations
							-	<u> </u>	OL	TOPSOIL; Gravelly Silty CLAY, lov dark brown	v plasticity,	м	s				0.00: Inferred TOPSOIL, grassed surface 0.05: Inferred NATURAL SOIL
				SPT 0.50 m 3, 3, 6 N = 9		73.4	- - - 1 -		СН	CLAY; high plasticity, red brown		 (>PL)	F				
				SPT 1.50 m 5, 10, 6/20mm N = R		72.4	2			becomes yellow brown becomes yellow brown with pale g SHALE: brownish grey, extremely		M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td>2.35: V-bit refusal</td></pl)<>	VSt				2.35: V-bit refusal
19-03-06			Not En			1 71.4	- 3- -			very low to low strength	weathered,						Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 20						.4 70.4	4					D					
p Tool Lib:						69.4	5			Target depth Hole Terminated at 5.00 m							
PSM 302.2.LIB.G.LB Log IS AU BOREHOLE 1 PSMA915.GPJ <-OnawingFile>> 21/11/20/2 15.41 10.03.00.09 Dargial Fence and Map Tool (Lib: PSM 3.02,1 2019-03-06 Prj: PSM 3.02.1 2019						 68.4	- - 6 - - -										
PSM4815.GPJ < <drawingfile>> 2'</drawingfile>						 67.4	7										
3 Log IS AU BOREHOLE 1	Method Penetration AS - Auger Screwing RR - Rock Roller No resistance ranging to refusal WB- Washbore refusal] -	⊻ Lev > Infl ⊲ Pai ■ Co	rtial Los mplete	SPT - Standard Penetra s	ole	Δ		re C - [- - \	Dry Mois Wet	t	VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
PSM 3.02.2 LIB.GLE		uppo - Ca			<u>Gr</u>	Core	recove ates ma	pre Los red (ha terial)		<u>Classification Syn</u> <u>and Soil Descript</u> Based on Unified Classification Sys	t ions Soil			< P = P < P	'L 'L		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH10

Engineering Log - Borehole Client: JBS&G											Project No.: Commenced:						815	
F	lien Proje Iole Iole	ct N Loca	ation	: Resider	dsoı	n Parl	k Sout	h, NS	W	lson Park South 28.1 m N MGA2020 Zone 56	Cor Log	mmen mplete gged E ecked	ed: By:			/10/	'202 '202	
	Drill N Hole			d Mounting: r:	Co	mmad	chio G	EO 30)5	Inclination: -90° Bearing:		Surfa tum:	ce:	68 AH	75 I D	m	0	perator: Matrix Drilling
			Dril	ling Informati	on					Soil Descrip	otion							Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding ional	J,	Moisture Condition	Consistency Relative Density	Pene	Pocke etron UCS (kPa	neter 5)	- Structure and Additional Observations
				U 0.50-0.90 m						FILL; Gravelly SAND, uniform, ligh Sandy CLAY trace Gravel, mediur sub-angular gravel up to 5mm, rec	n plasti	icity,	М	MD			4 11	0.00: Inferred FILL 0.15: Inferred NATURAL SOIL
AD/V				SPT 0.90 m 0.9 - 1.35 2, 2, 3 N = 5		1 67.8	- 1 -			becomes CLAY w Gravel			M (>PL)	F				
4			Encountered	SPT 2.00 m 2 - 2.45		66.8	2-			becomes CLAY				St				
			Not Encol	2 - 2.45 8, 6, 11 N = 17						becomes pale grey			M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt				
						 65.8	3-			SHALE; brownish pale grey, extre weathered, very low strength	 nely							2.80: V-Bit refusal Inferred BEDROCK, strength and weathering profile inferred from drillli resistance and cuttings
						 64.8	4						D					
						63.8	-5			Target depth								
							-			Hole Terminated at 5.00 m								
						 62.8	6											
						 61.8	7											
R	 	Meth Auger Rock	· Scre Rolle		lo re rang	ion sistano ing to usal	C -	∠ Le > Infl ⊲ Pa	Vater vel (Dat ow rtial Los mplete	SPT - Standard Penetra s	ple	est	M	loistui D M W	- C - N - V	Dry Noist Vet		Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
		Supp - C			<u>Gr</u>	Core	Log/Co recover ates ma loss	ed (ha		<u>Classification Synand Soil Descrip</u> and Soil Descrip Based on Unified Classification Sys	<u>tions</u> Soil				< P = P < P	L		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH11

C P F	Client Project Iole L	: ct Na _oca	me: tion:	Edmond	ntial Isor	Deve n Par	elopm k Sout	h, NS	W	son Park South 02.2 m N MGA2020 Zone 56	Project Comme Comple Logged Checke	enced: ted: By:		19)22
	Drill M Hole [d Mounting:	Coi	mmao	chio G	EO 30)5	Inclination: -90° Bearing:	RL Surf Datum:	ace:	70 AH	.10 ı ID		Operator: Matrix Drilling
<u> </u>				ing Informatio	on					Soil Descrip			7.0			Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, Bo Plasticity, Sensitivity, Additi	edding, onal	Moisture Condition	Consistency Relative Density	Pene	ocket etromet JCS kPa)	Additional Observations
AD/V				CBR 0.20-1.00 m SPT 0.50 m 5, 9, 8 N = 17		 69.1			OL CI-CH	TOPSOIL; Silty CLAY trace Gravel <u>lasticity</u> CLAY; medium plasticity, red brow) (>PL	_F_ St			0.00: Inferred TOPSOIL, grassed surface, rootlets observed up to 0.1m 0.10: Inferred NATURAL SOIL
				SPT 1.50 m 4, 10, 13/75mm N = R			-			becomes high plasticity, yellow bro SHALE; brownish grey, extremely		M (<pl< td=""><td>VSt</td><td></td><td></td><td>1.50: V-bit refusal 1.80: Inferred BEDROCK, observed fro</td></pl<>	VSt			1.50: V-bit refusal 1.80: Inferred BEDROCK, observed fro
AD/T			Not Encountered			65 _. 1 66.1 67.1 68.1	2			very low strength becomes pale grey, highly weather strenngth		D				SPT sample, strength and weathering inferred from drilling resistance and cuttings
						64.1				Target depth Hole Terminated at 5.00 m						
R	 	Metho Nuger	Scre Roller	Pene wing	o re ang	ion ing to usal	[⊻ Lev > Infl ⊲ Pa	<u>Vater</u> vel (Dati ow rtial Los mplete	SPT - Standard Penetral	le	<u>^</u>	D M	<u>re Cc</u> - D - N - V	lóist	VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
		Suppo - Ca			<u>Gr</u>	Core	Log/Co recove ates ma	ore Los red (ha	s	<u>Classification Syn</u> and Soil Descript Based on Unified Classification Sys	ions Soil			<u>stic L</u> < Pl = Pl < Pl		Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH12

С	lient	:		g Log - E JBS&G							Project I Comme	nced:		20/	M48 /10/2	022	
Н	Projec Iole L Iole F	oca	tion:	Edmon	dsoı	n Par	k Sout	h, NS	W	son Park South 13.2 m N MGA2020 Zone 56	Complet Logged Checked		20/ DL RS		022		
	orill M Iole E			d Mounting:	Co	mma	chio G	EO 30)5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	71 AH	.75 r I D	n	Opera	ator: Matrix Drilling
	Drilling Information							Soil Descrip	tion						Observations		
INIEIIIOU	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, onal	Moisture Condition	Consistency Relative Density	Pene l (ocket etrome JCS kPa)	ter	Structure and Additional Observations
							-	<u>** *</u>	OL CH	TOPSOIL; Silty Sandy CLAY, low	plasticity,		S			0.0	0: Inferred TOPSOIL; grassed sui 0: Inferred NATURAL SOIL
				SPT 0.50 m 3, 6, 7 N = 13		70.8	- - 1-			CLAY, high plasticity, red brown becomes red brown with pale grey	mottling	M (>PL)	St				
			ed	SPT 1.50 m 7, 9, 13 N = 22		69.8				becomes yellow brown with pale g		M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt				
			Not Encountered	ES 2.00-2.10 m	ו 22	68.8	- - - 3-			SHALE; extremely weathered, brovery low strangth						Infe wea	0: V-bit refusal erred BEDROCK, strength and athering inferred from drilling istance and cuttings
						 67.8	- - - 4 -					D					
						ω	-			becoms dark grey							
						99	-			Target depth Hole Terminated at 5.00 m							
						65.8	6										
						64.8	7										
R	 S - A R - R /B- W	<i>lethe</i> uger	Scre Rollei	wing N	lo re rang	t <u>ion</u> sistano ing to usal	[⊻ Le' > Infl ⊲ Pa	Vater vel (Dat ow rtial Los mplete	SPT - Standard Penetra s	ole	<u> </u>	M	<u>re Co</u> - D - N - W	ry loist	<u>n</u>	Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
C - Casing				ore Los red (ha	<u>ss</u>	<u>Classification Syr</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	t <u>ions</u> = PL Soil < PL						Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

BH13

Engir	nee	rin	g Log - B	Sor	ehc	ole				Project N	lo.:		PSI	M4815	
Client Proje Hole Hole	ct Na Loca	tion:	Edmon	ntial dsoi	n Par	k Sout	h, NS	W	son Park South 28.2 m N MGA2020 Zone 56	Commen Complete Logged E Checked			10/202 10/202		
	Drill Model and Mounting: Commachio Hole Diameter:)5	Inclination: -90° Bearing:	RL Surfa Datum:	75 AH	.50 m ID		perator: Matrix Drilling	
	Drilling Information							Soil Descrip						Observations	
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)		r Structure and Additional Observations
ADIV			B 0.20-0.80 m SPT 0.50 m 4, 6, 9 N = 15		 74.5	- - - 1		CH	TOPSOIL; SIlty CLAY, low plasticit brown CLAY; high plasticity; red brown	y, dark	M (>PL)	St	2	9 4 0	0.00: Inferred TOPSOIL, grassed surf 0.05: Inferred NATURAL SOIL
		Not Encountered	SPT 1.50 m 7, 8/50mm N = R		73.5	2			SHALE; brownish grey, extremely very low to low strength	weathered,	 (<pl)< td=""><td>VSt</td><td></td><td></td><td>1.55: V-bit refusal 1.70: SPT refusal Inferred BEDROCK, observed from S sample, strength and weathering are inferred from drilling resistance and cuttings</td></pl)<>	VSt			1.55: V-bit refusal 1.70: SPT refusal Inferred BEDROCK, observed from S sample, strength and weathering are inferred from drilling resistance and cuttings
		Not			1 1 71.5 72.5	3			becomes pale grey, highly weathe	red	D				
	i –				70.5	5			Target depth Hole Terminated at 5.00 m						
					 69.5	6									
					68.5	- 7— 									
AS - A RR - F WB- V	Metho Auger Rock	Scre Rolle	Pene wing N	lo re rang	ion sistano ing to usal	[⊻ Le > Infl ⊲ Pa	Vater vel (Dat low rtial Los mplete	SPT - Standard Penetra s	ple	<u>Λ</u>	D M W	<u>re Coi</u> - Dr - Mo - Wo stic Li	ðist et	Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
	Supp - Ca]]	Core	Log/Co recover ates ma loss	red (ha		<u>Classification Syn</u> and Soil Descrip Based on Unified Classification Sys	<u>tions</u> Soil			< PL = PL < PL		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH14

Ξn	gin	iee	rin	g Log - B	or	ehc	ole				Project N	No.:		PS	M481	15
P H	lient: rojec ole L ole F	t Na .oca	tion:	Edmono	lsor	n Par	k Sout	h, NS	W	son Park South 33.7 m N MGA2020 Zone 56	Commer Complet Logged I Checked	ed: By:				
				d Mounting:						Inclination: -90°	RL Surfa		73	.25 r		
Н	ole [Bearing:	Datum:		AH	ID		Operator: Matrix Drilling
			Drill	ing Informatio	on				1	Soil Descrip	otion	1				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	Pene I (ocket etromet UCS kPa)	eter Structure and Additional Observations
				U 0.50-0.90 m			-		CH	TOPSOIL; Clayey Sandy SILT, no dark brown, organic soil CLAY; high plasticity, red brown	n plastic, /		S			0.00: Inferred TOPSOIL, Grassed surface 0.10: Inferred NATURAL SOIL
				SPT 0.90 m 2, 4, 11 N = 15		72.3				becomes pale grey		M (>PL)	St			
			Not Encountered	SPT 2.00 m 11, 20, 20 N = 40		71.3	2			becomes yellow brown with pale g	rey mottling	M (<pl)< td=""><td></td><td></td><td></td><td></td></pl)<>				
			Not			1 70.3	3-						Н			3.30: V-bit refusal
						69.3	4			SHALE; pale grey, extremely weat low to low strength	hered, very	D				3.50: Inferred BEDROCK, strength a weathering inferred from drilling resistance and cuttings
						ю	-			becomes highly weahered						
						- 68				Target Depth Hole Terminated at 5.00 m		M				
						 67.3	6									
						66.3										
R		<i>lethe</i> uger	Scre Rollei	Pene wing N	o re ang	tion sistand ing to usal	C	⊻ Le > Inf	<u>Vater</u> vel (Dat low ırtial Los	SPT - Standard Penetra	ple	<u>^</u>	D M	re Co - D - N - V	lóist	VS - Very Soft S - Soft F - Firm VSt - Very Stiff
				Log/Co recover ates ma	ore Los red (ha		Loss <u>Classification Syr</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	tions = PL Soil < PL					H - Hard Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense			

Ρ	S	Μ
H		}}}

BH15

C P H	lient: rojec lole L	t Na ocat	me: tion:	Edmon	ntial dsor	Deve n Par	elopme k Sout	h, NS	W	lson Park South 22.6 m N MGA2020 Zone 56	Commenced: Completed: Logged By: Checked By:				/10/	/202 /202	
	Drill Model and Mounting: Commachio Hole Diameter:							EO 30)5	Inclination: -90° Bearing:	RL Surface: Datum:			3.25 HD	m	0	perator: Matrix Drilling
	Drilling Information							Soil Descri			,				Observations		
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, onal	Moisture Condition	Consistency Relative Density	F Pen	Pocke etron UCS (kPa	et neter	- Structure and Additional Observations
			-			. ,	_	<u> </u>	OL	TOPSOIL; Clayey SILT, non plast brown, organic soil	c, dark	w	s	<u> </u>	30 20	50	0.00: Inferred TOPSOIL, grassed sur
				SPT 0.50 m 3, 6, 8 N = 14		3	-		СН	CLAY; high plasticity, yellow brown becomes red brown with pale grey		M (>PL					0.30: Inferred NATURAL SOIL
						1 67.3	1					(~~Ľ) St				
				SPT 1.50 m 11, 8/20mm									н				
				N = R		66.3	2-			SHALE, brownish pale grey, extre weathered, very low strength	nely						1.75: V-bit refusal Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
						 65.3	3-										
						 64.3	4										
						 63.3	5					D					
						 62.3	6			becomes, dark grey, highly weath strength	red, low						
						61.3	7										
	S - Ai	/ letho lger	Scre	wing 📈 N		sistano			<i>Vater</i> /el (Dat	<u>Samples and To</u>) U - Undisturbed Sam	ble	Δ	<i>loist</i> u D) - [Dry		Consistency/Relative Dens VS - Very Soft
R	R - R /B- W	očk F	Roller		rang	ing to usal	C -	> Infl ⊲ Pa	ow rtial Los	D - Disturbed Sample SPT - Standard Penetra s	ion Test		N	1 - Ñ V - \	∕lóist	t	S - Soft F - Firm VSt - Very Stiff H - Hard
Graphic Log/Co				red (hatching and Soil Descripti				tions = PL					Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		**

BH15

Page 2 of 2

Er	ngin	ee	ring	g Log - E	eho	ole				Project		PS	M48	315			
F H	Client: Project Hole Lu Hole P	t Na ocat	tion:	Edmor	ential ndsor	n Parl	k Sout	th, NS	W	lson Park South 22.6 m N MGA2020 Zone 56	Comm Comple Logged Checke	eted: d By:					
C		odel	anc	Mounting:	-					Inclination: -90° Bearing:	RL Sur Datum	rface:	68 AH	.25 r			
				ing Informat	ion					Soil Descri							Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, F Plasticity, Sensitivity, Add	Bedding,	Moisture Condition	Consistency Relative Density	Pene l	JCS (Pa)	eter	Structure and Additional Observations
AU/I							- - - 9 -			SHALE, brownish pale grey, extre weathered, very low strength <i>(cor</i> becomes, medium strength	mely itinued)	м		2	3	2	8.00: Water table, inferred from wet cuttings
						58.3	- 10-					w					
						1 57.3 E	- - - 11			Target depth Hole Terminated at 10.00 m							
						 56.3	- - 12- -										
						 55.3	- 13 -										
						 54.3	- 14										
						 53.3	- 15— - - -										
R	<u>M</u> AS - Au RR - Ro VB- W	ock F	Scre\ Roller	ving 🛃	rang ref	sistanc ing to usal		⊻ Le ^v > Infl ⊲ Pa ▼ Co	rtial Los mplete	SPT - Standard Penetra SPT - Standard Penetra	nple e ation Test	<u> </u>	M W	<u>re Co</u> - D - M - W	ry oist ′et	ion	Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose
		 - Ca				Core	Log/Co recove ates ma loss	red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	d Soil		:	< PL = PL < PL			L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH16

	lient:			g Log - E JBS&G							Project Comme				M48 /10/2		
Н	rojec lole L	.oca	tion	Edmon	dsor	n Par	k Sout	h, NS	W	son Park South	Comple Logged	d By:		DL		202	2
	ole F			d Mounting:	-		1464.0			03.6 m N MGA2020 Zone 56 Inclination: -90°	Checke		70	RS 0.00 r			
Н	ole D	Diam	eter	:						Bearing:	Datum:	Datum:				0	perator: Matrix Drilling
		,	Drill	ling Informati	ion					Soil Descri	ption	ion					Observations
INIEILIOU	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi	Bedding,	Moisture Condition	Consistency Relative Density	Pene l (1 00 00	JCS kPa)	eter	Structure and Additional Observations
							-	<u> </u>	OL	TOPSOIL; Silty CLAY, low plastic brown	ity, dark	w > LL	s	7 0	<u>6</u> 4	· ທ	0.00: Inferred TOPSOIL, grassed surface, rootlets observed up to 0.6m
				SPT 0.50 m 3, 4, 6			-		СН	Sllty CLAY; high plasticity, yellow	brown	w > PL		-			depth 0.30: Inferred NATURAL SOIL
				3, 4, 6 N = 10		69.0	1-			becomes CLAY; red brown							
				SPT 1.50 m 8, 11, 14 N = 25		0	-					M (>PL	St				
			Not Encountered			 68.0	2			becomes CLAY, yellow brown							
			Not En	SPT 2.50 m 8/115mm N = R		 67.0	3-					M (<pl< td=""><td>н</td><td></td><td></td><td></td><td>2.62: SPT refusal</td></pl<>	н				2.62: SPT refusal
						 66.0	4			SHALE, brownish grey, extremely very low strength	weathered,	D	-	-			3.70: Inferred BEDROCK; strength a weathering inferred from drilling resistance and cuttings
						0.	-										
Ī						65	-			Target depth Hole Terminated at 5.00 m							
						 64.0	6										
						 63.0	7										
A	 <u> </u> S - A R - R	letho uger ock F	Scre	wing 🖂 N		<u>ion</u> sistano		∠ Le	<u>Vater</u> vel (Dat	<u>Samples and T</u> e) U - Undisturbed Samp D - Disturbed Sampl	nple	<u> </u>	D	<u>ire Co</u> - D 1 - M	ry	ion	<u>Consistency/Relative Dens</u> VS - Very Soft S - Soft
W	/B- W	/asht	ore		refi 2	usal	-	Co	rtial Los mplete	SPT - Standard Penetra s Loss	ation Test		V	/ - W stic L	/et <u>imit</u>		F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose
		uppo - Ca]]	Core	recover ates ma	ed (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	d Soil			< PL = PL < PL			L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ

BH17

Er	ngir	nee	rin	g Log - E	Bor	ehc	ole			Project No.:				PSM4815				
F	Client Proje Hole Hole	ct Na Loca	tion	Edmon	ntial dsoi	n Par	k Sout	h, NS	W	son Park South 87.5 m N MGA2020 Zone 56	Commenced:18/10/20Completed:18/10/20Logged By:DLChecked By:RS							
	Drill N Hole			d Mounting:	Co	mmao	chio G	EO 30	05	Inclination: -90° Bearing:	RL Surfa Datum:	RL Surface: 69.50 m Datum: AHD 0					perator: Matrix Drilling	
				ling Informat	ion					Soil Descrip							Observations	
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit		Moisture Condition	Consistency Relative Density	Pene	Pocketror UCS (kPa	netei S)	r Structure and Additional Observations	
							-		OL	TOPSOIL; Silty CLAY, dark brown	, low		S	5 7	<u> </u>	21 40	0.00: Inferred TOPSOIL; grassed surface, rootlets observed up to D =	
		Î I I		U50 0.50-0.90 m			-		CI-CH	CLAY; medium plasticity, red brow becomes CLAY w gravel, red brow grey mottling, sub-angular gravel (n with pale		F				0.05m 0.10: Inferred NATURAL SOIL	
AD/V				SPT 0.90 m 5, 10, 12 N = 22		68.5	1			becomes CLAY		M (>PL)	VSt					
			Not Encountered	SPT 2.00 m 11, 10/80mm N = R		67.5	2-			becomes CLAY, high plasticity		M (<pl)< td=""><td>н</td><td></td><td></td><td></td><td>2.00: V-bit refusal</td></pl)<>	н				2.00: V-bit refusal	
			Not End			66.5	- - 3-			SHALE; pale grey, extremely weal low strength	hered, very						2.40: Inferred BEDROCK, strength a weathering inferred from drilling resistance and cuttings	
						 65.5						D						
						64.5				becomes dark grey, highly weathe	red							
		i –				Ó	-			Target depth Hole Terminated at 5.00 m								
						 63.5												
						 62.5	- - 7											
A F V	4S - A RR - F WB- V	Metho Auger Rock	Scre Rolle		rang	t <u>ion</u> sistano ing to usal	[⊻ Le > Inf ⊲ Pa	rtial Los	SPT - Standard Penetra s	ole	<u> </u>	loistu D M W	re Co - [- N - V)ry /loist		Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard	
	Support Graphic Log/Con C - Casing Core recovere C - Casing Core loss			ore Los red (ha		Loss <u>Classification Syr</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	t ions Soil			s <i>tic I</i> < P = P < P	L	t	H - Hard Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense					

Ρ	S	Μ
H		}}}

BH18

				g Log - E		enc					Project Comme	-				PSM4815 18/10/2022				
	Projec			Reside	ntial		•			lson Park South		Completed: 18/10/20								
	łole L łole F									14.3 m N MGA2020 Zone 56	Logged By: DL Checked By: RS									
С	Drill M	lode	lan	d Mounting:	-					Inclination: -90°	RL Surface: 74.30 m									
F	lole [Diam	neter	:						Bearing:	Datum:		AH	ID		0	perator: Matrix Drilling			
			Drill	ling Informat	ion					Soil Descri	otion						Observations			
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Pene L	JCS (Pa)	eter	Structure and Additional Observations			
							_	<u> \// \//</u>	OL	TOPSOIL, Sandy Silty CLAY, low	plasticity,		F	0 - -	<u>0</u> 4	2 2	0.00: Inferred TOPSOIL, gravel surface			
AU/V				SPT 0.50 m 3, 6, 9 N = 15 0.50-0.95 m		1 73.3	- - 1		СН	CLAY; high plasticity, red brown	mottling	_/ (>PL)	St				0.20: Inferred NATURAL SOIL			
			pe	SPT 1.50 m 9, 15, 14 N = 29 1.50-1.95 m		1 72.3	- - 2-					M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt							
			ountere			_72	-						н							
AUI			Not Encountered	SPT 3.00 m 6/100mm N = R 3.00-3.45 m		70.3 71.3	- - 3 - 4 - -			SHALE; pale grey, highly weather strength	∋d, very low	D					2.35: V-bit refusal 2.45: Inferred BEDROCK; strength a weathering inferred from drilling resistance and cuttings			
						69.3	5-			-										
						 68.3 6	6			Target depth Hole Terminated at 5.00 m										
						67.3 6	- - - 7 - -													
R	<u> </u> 	očk F	Scre Rollei	wing 🗖 l	rang ref	sistanc ing to usal		⊻ Le ^v > Infl ⊲ Pa ▼ Co	rtial Los mplete	SPT - Standard Penetra s	ple	<u> </u>	M	<u>re Co.</u> - Di - M / - W	ry oist /et	ion	Consistency/Relative Dens VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose			
Support Graphic Log/Core C - Casing Core recovered C - Cosing Core loss			red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	<u>tions</u> Soil	mbols < PL					L - Loose MD - Medium Dense D - Dense VD - Very Dense								

Ρ	S	Μ
H		}}}

BH19

P H	Client: Projec Iole L Iole F	t Na .oca	tion	Edmon	ntial dsoi	n Parl	Sout	h, NS	W	son Park South 95.4 m N MGA2020 Zone 56	Commenced:18/10/20.Completed:18/10/20.Logged By:DLChecked By:RS					
	Drill M Iole D			d Mounting:	Co	mmao	chio G	EO 3	05	Inclination: -90° Bearing:	RL Su Datum	urface: n:	74 A⊢	.60 m ID		Operator: Matrix Drilling
			Dril	ling Informati	on					Soil Descri	otion					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Penet U (k	cket romete CS Pa) ଚୁ ବୁ ଚ୍ରି	Additional Observations
							-		OL CI-CH	TOPSOIL; Clayey SILT, non plast brown CLAY; medium plasticity, red brov			S F	6 7	040	0.00: Inferred TOPSOIL, grassed surface, rootlets observed up to D = 0.1m 0.10: Inferred NATURAL SOIL
AU/V				SPT 0.77 m 4, 5, 9 N = 14		1 73.6				becomes, high plasticity, pale gre	1	M (>PL	St			
			žď	SPT 1.50 m 10, 12, 18 N = 30		1 72.6	- -			becomes red brown			VSt			
			Not Encountered			72	-			SHALE; brownish grey, extremely very low strength	weathered	d,				2.00: V-bit refusal Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
			2	SPT 3.00 m 4/30mm N = R		71.6	3			becomes, dark grey, highly weath strength	ered, low	D				
						1 70.6	4									
						69.69	5			Target depth Hole Terminated at 5.00 m						
						 68.6	6									
						1 67.6	- 7 -									
R		<i>lethc</i> uger ock F	Scre Rolle		lo re rang	ion sistanc ing to usal	[⊻ Le > Inf ⊲ Pa	<u>Vater</u> vel (Dat low irtial Los omplete	SPT - Standard Penetra s	ple	<u>^</u>	M W	- Dr - Mo - W	y bist et	n <u>Consistency/Relative Dens</u> VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
<u>Support</u> C - Casing C - Casing Graphic Log/Con Core recovere C - Casing Core loss			red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	tions = PL Soil < PL				<u>mit</u>	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense					

Ρ	S	Μ
H		}}}

BH20

Er	ngin	nee	rin	g Log - E	Bor	eho	ole				Project No.: PSM48					815	i
F	Client Projec Hole L Hole F	ct Na ₋oca	tion	Edmon	ntial dsor	n Par	k Sout	h, NS	W	son Park South 95.8 m N MGA2020 Zone 56	Comme Comple Loggeo Checke	eted: I By:			/10/	'202 '202	
	Drill M Hole [d Mounting:	Со	mma	chio G	EO 30	05	Inclination: -90° Bearing:	RL Sur Datum:	face:	78 AH	.60 i ID	m	0	perator: Matrix Drilling
			Dril	ling Informat	ion					Soil Descri	otion	tion					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addi	edding, ional	Moisture Condition	Consistency Relative Density	Pene (ocke etron UCS kPa	netei 5)	r Structure and Additional Observations
				B 0.50-1.00 m U50			-	<u> </u>	OL CH	TOPSOIL; Silty Sandy CLAY, low dark brown CLAY; high plasticity, red brown	plasticity,	м	S F	0	10,	5 4	0.00: Infered TOPSOIL, grassed surfac 0.20: Inferred NATURAL CLAY
				0.50-0.90 m SPT 0.90 m 16, 22, 27 N = 49		1 77.6	- 1 -			becomes pale grey		(>PL)	VSt				
AD/T			Not Encountered	SPT 2.00 m 14, 8/130mm N = R		 76.6	2			becoms yellow brown		M (<pl)< td=""><td>Н</td><td></td><td></td><td></td><td></td></pl)<>	Н				
			ž			1 75.6	3			SHALE; brownish pale grey, extre weathered, very low strength	mely						2.80: Inferred BEDROCK, strength and weathering inferred from drilling resistance and cuttings
						 74.6	4			becomes, dark grey, highly weath strength	ered, low	D					
						73.6	5	<u></u>		Hole terminated at 5.0m Target depth Hole Terminated at 5.00 m							
		 				 72.6	6										
						1 71.6											
A F V	<u>A</u> S - A RR - R VB- V	Metho Nuger Rock F	Scre Rolle		rang ref	sistano ing to usal	[I Le ^v → Infl □ Pa ■ Co	rtial Los mplete	SPT - Standard Penetra	ple	<u> </u>	W	re Co - C - N - V)ry 1oist Vet		Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
Image: standard s				red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			< PI = PI < PI	_		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense				

Ρ	S	Μ
H		}}}

BH21

Er	ngir	nee	rin	g Log - E	Bor	ehc	le				Project No		o.:		PS	M4	815	
F	Client Projec Hole I Hole F	ct Na Loca	tion	Edmon	ntial dsor	n Parl	< Sout	h, NS	W	son Park South 49.9 m N MGA2020 Zone 56	Commenced: Completed: Logged By: Checked By:					/10/	202 202	
	Drill M Hole [d Mounting:	Cor	mmad	chio G	EO 30	05	Inclination: -90° Bearing:		Surfactum:	ce:	79. AH	.00 r ID	n	0	perator: Matrix Drilling
			Dril	ling Informati	on			Soil Description					,					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi	eddinç ional	g,	Moisture Condition	Consistency Relative Density	Pene l	UCS kPa	neter)	Structure and Additional Observations
				SPT 0.50-0.95 m			-		OL CI-CH	TOPSOIL; Silty CLAY, low plastici brown CLAY; medium plasticity, red brov	-	k/		F	2 7	1.0.1	4 0	0.00: Inferred TOPSOIL, grassed surface, rootlets observed up to 0.05m 0.20: Inferred NATURAL SOIL
				3, 5, 6 N=11 B 1.00-1.50 m		1 78.0	- 1					Q	M (>PL)	St				
			ountered	SPT 1.50-1.95 m 6, 8, 16 N = 24		1 77.0	- - 2			becomes high plasticity, yellow br	wn	-	M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt				
AD/T			Not Encountered	ES 2.80-3.00 m SPT		1 76.0	- - 3-			SHALE; brownish pale grey, extre	mely			н				3.00: Inferred BEDROCK, strength and
				3.00-3.45 m 24/150mm N = R		1 75.0	- - - 4 -			weathered, vwry low to low streng			D					wethering inferred from drilling resistar and cuttings
						74.0	- - - 5			becomes pale grey, highly weather Hole terminated at 5.0m Target depth	red							
						 73.0	- - 6-			Hole Terminated at 5.00 m								
						72.0	- - - 7											
F	 АS - А RR - Я RR - Я	Metho Auger Rock F	Scre Rolle	wing N	lo res rang	ion sistano ing to usal	[⊻ Le > Inf ⊲ Pa	rtial Los	SPT - Standard Penetra s	ple	est	M	M	r <u>e Co</u> - D - N - W)ry 1oist		Consistency/Relative Densi VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
	_	Suppo - Ca				Core	Log/Co recove ates ma	ore Los red (ha		Loss <u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy:	<u>tions</u> Soil				s <i>tic L</i> < PL = PL < PL	-		Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

Borehole No.

BH22

Ξn	igin	nee	rin	g Log - B	or	ehc	ole				Project	No.:		PS	M48	15	
P H	Client Projec Iole L Iole F	ct Na ₋oca	tion	Edmono	lsor	n Par	k Sout	nent, Edmondson Park South hth, NSW 0 m E 6238541.0 m N MGA2020 Zone 56				Commenced:18/10/20Completed:18/10/20Logged By:DLChecked By:RS					
)rill M Iole [d Mounting:	Coi	mma	chio G	EO 30)5	Inclination: -90° Bearing:	RL Surf Datum:	ace:	76 AH	.00 n	n	Or	perator: Matrix Drilling
				ing Information	on			Soil Description					7.0				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	Pene L (ł	cket trome JCS (Pa)	eter	Structure and Additional Observations
				B 0.50-1.50 m		75.0	- - - 1		OL CH	TOPSOIL; Clayey SILT, non plasti brown CLAY; high plasticity, yellow browr becomes red brown		M (>PL)	S St		<u>6</u> 4	2	0.00: Inferred TOPSOIL, grassed surf
			Not Encountered	SPT 1.50 m 7, 11, 14 N = 25		74.0	2			becomes pale grey SHALE: brownish grey, extremely very low strength	weathered,	M (<pl)< td=""><td>VSt H</td><td></td><td></td><td></td><td>2.50: V-bit refusal Inferred BEDROCK, strength and weahering inferred from drilling</td></pl)<>	VSt H				2.50: V-bit refusal Inferred BEDROCK, strength and weahering inferred from drilling
				SPT 3.00 m 9/90mm N = R		72.0 73.0	3			becomes pale grey		D					resistance and cuttings
		i i				71.0				Target depth Hole Terminated at 5.00 m							
						1 70.0	6-										
						0.09	7										
A R W	 S - A R - R /B- W	Metho Nuger Rock F	Scre Rollei	wing N	o re ang	ion sistano ing to usal	C -	⊻ Le > Infl ⊲ Pa	<u>Vater</u> vel (Dat ow rtial Los mplete	SPT - Standard Penetra s	ole	<u>^</u>	M W	- Di - M - W	ry oist ′et	<u>on</u>	Consistency/Relative Dens. VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
	_	uppo - Ca]]	Core	Log/Co recover ates ma loss	red (ha		<u>Classification Syn</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	t ions Soil			stic Li < PL = PL < PL			Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ

BH23

En	igin	iee	rin	g Log - E	Bor	ehc	ole				Project No.: PSM48			SM4	815		
P H	Client: Projec Iole L Iole F	t Na .oca	tion	Edmor	ential Idsoi	n Parl	k Sout	h, NS	W	lson Park South 01.2 m N MGA2020 Zone 56	Commenced:18/10Completed:18/10Logged By:DLChecked By:RS				5/10/ _		
)rill M Iole [d Mounting:	Co	mmao	chio G	EO 3	05	Inclination: -90° Bearing:	RL Surf Datum:		72 Al-	.00 ID	m	0	perator: Matrix Drilling
				ing Informat	ion					Soil Descri			7.1				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit		Moisture Condition	Consistency Relative Density	Pen	Pocketror UCS (kPa	netei S	Structure and Additional Observations
				SPT 0.50 m			-		CH	TOPSOIL; Clayey Sandy SILT, no dark brown CLAY; high plasticity, red brown	n plastic,	<u>_м</u>	S	, , , , , , , , , , , , , , , , , , , 		0 1	0.00: Inferred TOPSOIL, grassed surface, rootlests observed up to D = 0.10: Inferred NATURAL SOIL
ADN				2, 4, 5 N = 9		71.0	- 1 -					M (>PL)	St				
			ntered	SPT 1.50 m 9, 17, 24 N = 41		70.0	2-			becomes yellow brown		M (<pl)< td=""><td></td><td></td><td></td><td></td><td>2.00: V-bit refusal</td></pl)<>					2.00: V-bit refusal
AU/I			Not Encountered	SPT 3.00 m 4, 10, 15 N = 25		69.0				becomes CLAY with gravel, sub-a gravel 5-7mm	ngular	D	Н				
						68.0	4			SHALE. pale grey, extremely to hi weathered, very low strength	jhly						4.00: Inferred BEDROCK, strength at weathering inferred from drilling resistance and cuttings
						67.0	5			Target depth Hole Terminated at 5.00 m							
						66.0	6										
						 65.0	7										
R		<i>lethe</i> uger	Scre Rolle	wing 🖂	rang	t <u>ion</u> sistanc ing to usal	[⊻ Le > Inf ⊲ Pa	<i>Nater</i> vel (Dat low artial Los omplete	SPT - Standard Penetra s	ple	<u> </u>	W	- C - N - V	Dry Moist Vet	t	Consistency/Relative Densi VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose
	Support C - Casing				recove ates ma	red (ha		<u>Classification Syr</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			<u>stic I</u> < P = P < P	L L	<u> </u>	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense		

Ρ	S	Μ
H		**

BH24

Er	ngin	iee	rin	g Log - E	Sor	eho	le				Project No.:				M48	815	
F	Client: Projec Iole L Iole F	t Na _oca	tion	Edmon	ntial dsor	n Parl	Sout	h, NS	W	lson Park South 55.7 m N MGA2020 Zone 56	Comme Complet Logged Checked	ted: By:		17/ 17/ DL RS	10/:		
	Drill M Hole D			d Mounting:	Cor	mmac	chio G	EO 30	05	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	76 AH	.20 n ID	n	0	perator: Matrix Drilling
			Drill	ling Informati	on					Soil Descrij	coil Description						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addii	edding, ional	Moisture Condition	Consistency Relative Density	Pene L	JCS kPa)	neter)	Structure and Additional Observations
				SPT 0.50 m			-		OL CI-CH	TOPSOIL; Clayey SILT, non plast brown CLAY; medium to high plasticity, r		w	S	2 7	9	1 10	0.00: Inferred TOPSOIL, rootlets observed up to depth D = 0.15m 0.20: Inferred NATURAL SOIL
AD/T			Encounte	4, 10/110mm N = R		1 75.2	- 1			becomes high plasticity, yellow bro	own	M (>PL)	St				
A			Not	SPT 1.50 m 18, 26/90mm N = R		 74.2	- - 2			SHALE; pale grey, extremely wea strength	hered, low	D					1.50: Inferred BEDROCK, strength ar weathering inferred from drilling resistance and cuttings
						73.2	3-			TC-bit refusal Hole Terminated at 2.60 m							2.60: TC-bit refusal
						 72.2	- - 4 -										
						71.2	- 5 -										
						1 70.2	- - 6 -										
						 69.2	- - 7 - -										
AR V		<i>lethe</i> uger	Scre Rollei		rangi	ion sistanc ing to usal	[⊻ Le > Inf ⊲ Pa	Vater vel (Dat low urtial Los omplete	SPT - Standard Penetra	ple	<u> </u>	W	- Di - M - W	ry oist /et		Consistency/Relative Densi VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard F - Friable
		<u>ирр</u> - Са			<u>Gr</u>	Core	Log/Co recove ites ma loss	red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			stic L < PL = PL < PL			Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH25

En	ngin	iee	rin	g Log - B	or	ehc	ole				Project N	No.:		P	SM4	815	;
P H	Client: Projec Hole L Hole F	ct Na ₋oca	tion:	Edmono	dsor	n Par	k Sout	h, NS	W	son Park South 40.6 m N MGA2020 Zone 56	Commer Complet Logged Checked	ed: By:			7/10/ _	/202 /202	
	Drill M Hole D			d Mounting:						Inclination: -90° Bearing:	RL Surfa Datum:	ace:	79 AH	.50	m	0	perator: Matrix Drilling
				ing Informati	on					Soil Descri						0	Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	l Pen	UCS (kPa	netei S	r Structure and Additional Observations
_			-			()			OL	TOPSOIL; Silty CLAY, low plasticit	y, dark		F	10	300	50	0.00: Inferred TOPSOIL 0.10: Inferred NATURAL SOIL
				SPT 0.50 m 8, 30,			-		СН	CLAY; high plasticity, red brown	/	(>PL)	St				
				30/100mm N = R		78.5	1			becomes pale grey		M (<pl)< td=""><td>н</td><td></td><td></td><td></td><td></td></pl)<>	н				
			Not Encountered	SPT 1.50 m 23, 15/100mm N = R		77.5	2-			SHALE; brownish pale grey, extre weathered, very low strength	nely						1.70: SPT refusal Inferred BEDROCK, indicated from SP sample, strength and weathering inferr from drilling resistance and cuttings
AD/T			Not Enc			1 76.5	3-					D					
						1 75.5	4			becomes low strength							
						74.5	5-			becomes dark grey Target depth							
							-			Hole Terminated at 5.00 m							
						 73.5	6-										
						 72.5											
R	<u>A</u> S - A R - R VB- W	ločk F	Scre Rollei	wing N	o re rang	ion sistand ing to usal	-	∠ Le > Inf ⊲ Pa	<u>Vater</u> vel (Dat low rtial Los mplete	SPT - Standard Penetra	ple	<u>^</u>	M	-	Dry Moist		VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
		uppo - Ca			<u>Gr</u>	Core	Log/Co recover ates ma	red (ha	<u>ss</u>	<u>Classification Syn</u> <u>and Soil Descrip</u> Based on Unified Classification Sys	<u>tions</u> Soil			stic < F = F < F	L	<u>t</u>	Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

Borehole No.

BH26

Er	ngiı	nee	rin	g Log - E	Bor	ehc	ole				Project	No.:		P	SM4	1815	5
	Clien [:] Proje		ame	JBS&G		Deve		ent F	dmon	son Park South	Comme Comple					/202	
	Hole						•				Logged			D		/202	-2
ŀ	lole	Posi	tion:	See Fig	gure	1 30	1351.2	2 m E	62385	59.6 m N MGA2020 Zone 56	Checke	ed By:		R	S		
	Drill N Hole			d Mounting:	Co	mmao	chio G	EO 3	05	Inclination: -90° Bearing:	RL Surl Datum:			3.80 HD	m	С	perator: Matrix Drilling
			Dril	ling Informat	ion				otion						Observations		
												sity					
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit		Moisture Condition	Consistency Relative Density	Per	Pock letroi UC (kPa 00 000	mete S a)	r Structure and Additional Observations
							_	<u> </u>	OL	TOPSOIL; Clayey SILT, non plasti brown	c, dark	w	s	-		5 4	0.00: Inferred TOPSOIL; grassed surface, rootlets observed up to D =
		i l					-	Ť	CI-CH	CLAY; medium plasticity, dark brow	vn		F				0.2m 0.30: Inferred NATURAL SOIL
				SPT 0.50 m 3, 4, 5 N = 9 B 0.50 m		ω	-			becomes high plasticity, red brown		M (>PL)	St				
				0.00 11		77.8	1			becomes light brown							
		i		SPT 1.50 m 8/70mm	zz		-					M (<pl)< td=""><td>н</td><td></td><td></td><td></td><td></td></pl)<>	н				
			ntered	N = R		76.8	2			SHALE; pale grey, highly weathere strength	d, very low	,					1.80: Inferred BEDROCK, strength ar weathering inferred from drilling resistance and cuttings
AD/T			Not Encountered				-										
			ž			1 75.8	3-										
							-					D					
						 74.8	-										
						12	-			becomes low strength							
						<u>8</u> .											
		l l				73	-			Target depth Hole Terminated at 5.00 m							
		i I				1 72.8	6										
		i I					-										
		 				71.8	7-										
							-										
F	48 - 4 RR - 4 VB- 1	Meth Auger Rock	Scre Rolle	wing 🖂 N	rang	t <u>ion</u> sistano ing to usal	[⊻ Le > Inf ⊲ Pa	Vel (Dat vel (Dat dow artial Los omplete	SPT - Standard Penetra s	ole	<u> </u>	N	<u>ire C</u> - 1 - / -	Dry Mois		VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard
	-	Supp - С			<u>Gr</u>	Core	Log/Co recove ates ma	ore Lo	ss	<u>Classification Syr</u> <u>and Soil Descripion</u> Based on Unified Classification Sys	t ions Soil			<u>stic</u> < F = F < F	א	t	Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH27

En	igin	ee	rin	g Log - B	lor	ehc	ole						Project No.:				PSM4815				
P H	Client: Projec Iole L Iole F	t Na .oca	tion	Edmon	dsoi	n Parl	k Sout	h, NS	SW	lson Park South 82.7 m N MGA2020 Zone 56	C Lo	ommer omplet ogged hecked	ed: By:			7/10 L	/202 /202				
				d Mounting:						Inclination: -90°		L Surfa	ace:		.10	m					
Г	lole [ling Informati	<u></u>					Bearing: Soil Descri		atum:		AF	טו		0	perator: Matrix Drilling Observations			
		Т												ţ				Observations			
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi			Moisture Condition	Consistency Relative Density	Pen	Pock letror UCS (kPa	mete S a)	r Structure and Additional Observations			
				ES 0.30-0.50 m SPT 0.50 m			-		OL CI-CH	TOPSOIL; Clayey SILT; non plast brown CLAY; medium plasticity, red brov		ark/		F				0.00: Inferred TOPSOIL; grassed surfa 0.20: Inferred NATURAL SOIL			
				3, 5, 13 N = 18		80.1	- 1			becomes yellow brown with pale g	ray n	nottling	M (>PL)	St							
			p∈	SPT 1.50 m 12, 27, 21/80mm N = R		79.1	- - -			becomes high plasticity			M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td></td></pl)<>	VSt							
AD/T			Not Encountered			52	-			SHALE; brownish grey, extremely	wea	thered.	_	н				2.50: Inferred BEDROCK; strength an			
			No	SPT 3.00 m 3 - 3.45m 8/60mm N = R	ZZ	78.1	3-			very low strength		,	D					weathering inferred from drilling resistance and cuttings			
						1.77	- - 4 -			becomes pale grey, highly weathe strength	red, I	low									
						76.1				Target depth Hole Terminated at 5.00 m											
						1 75.1	6-														
						 74.1															
R		letho uger ock F	Scre Rolle	wing N	lo re rang	t <u>ion</u> sistanc ing to usal	[-	⊻ Le > Inf ⊲ Pa	artial Los	SPT - Standard Penetra s	ple	Test	<u> </u>	M W	-	Dry Mois Wet	t	VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard			
Method Penetration AS - Auger Screwing RR - Rock Roller WB- Washbore No resistance ranging to refusal 2 Capport C - Casing Core recover indicates male Core loss				ore Lo red (ha	(hatching and Soil Description			o <u>tions</u> = PL d Soil < PL				νL νL	<u>t</u>	Fr - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense							

Ρ	S	Μ
H		**

BH28

Er	ngin	ee	rin	g Log - E	Bor	ehc	ole				Project	No.:		PS	M4	815	
F	Client: Projec Hole L	t Na .oca	tion:	Edmon	ntial dsoi	n Parl	k Sout	th, NS	W	Ison Park South	Comme Comple Logged	eted: By:		18, DL	/10/	202	
				See Fig Mounting:						40.5 m N MGA2020 Zone 56 Inclination: -90°		Checked By: RS RL Surface: 76.00 m					
	Hole D			-	CU	mina	51110 G	20 3	55	Bearing:	Datum:						perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Descri	ption						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi		Moisture Condition	Consistency Relative Density	Pene I (Pocket Penetrometer UCS (kPa) 8 8 8 8 8		Structure and Additional Observations
							_	<u> </u>	OL	TOPSOIL; Silty CLAY, low plastici brown	ty, dark		S			5	0.00: Inferred TOPSOIL; observed rootlets up to D = 0.2m
AD/V			tered	SPT 0.50 m 4, 7, 5 N = 12			-		CI-CH	CLAY; medium plasticity, red brov	vn	м	St				0.40: Inferred NATURAL SOIL
A			Not Encountered			75.0	1			becomes high plasticity, light brow grey mottling	<i>ı</i> n with pale	(>PL) VSt				
AD/T			-	SPT 1.50 m 4/50mm N = R		74.0				SHALE; brownish pale grey, very	low strength						1.60: V-Bit refusal 1.80: Inferred BEDROCK; observed fr SPT sample, strength and weathering
A		z				12	-			TC-bit refusal		D					observed from driling resistance and cutting
						72.0 73.0	3										
						71.0	5										
						70.0	6	-									
						 69.0											
F	<u>M</u> AS - Ai RR - Ri VB- W	očk F	Screv Roller	wing 📈 N	ranging to refusal				l Vel (Dat low rtial Los mplete	SPT - Standard Penetra s	ample ple tration Test			<u>re Co</u> - D - N - N stic L	iry loist /et		Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable
	_	<u>иррс</u> - Са			<u>Gr</u>	Core	Log/Co recove ates ma loss	red (ha		<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy:	tions Soil			< Pl = Pl < Pl	-	-	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH29

Client: Projec Hole L	: ct Na	ime:		; ntial	Deve	elopme			son Park South	Project N Commer Complet Logged I	nced: ed:		18/	M481 10/20 10/20	22
Hole I							'		76.1 m N MGA2020 Zone 56	Checked	-		RS		
Drill M Hole [d Mounting:	Co	mmad	chio G	EO 3(05	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	78 A⊢	.80 n JD		Operator: Matrix Drilling
			ing Informat	ion					Soil Descrip			7.0			Observations
Method Penetration	Support		Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding,	Moisture Condition	Consistency Relative Density	Pene L (ł	ocket tromete JCS (Pa)	er Structure and Additional Observations
			SPT 0.50 m 6, 9, 12 N = 21		77.8	1-4	** **	OL CI-CH	TOPSOIL; Clayey SILT, non plasti brown CLAY; medium plasticity, yellow br becomes high plasticity, red brown becomes yellow brown with pale g	/ rown I	 M (>PL)	S F St	10	30 40	5 0.00: Inferred TOPSOIL 0.10: Inferred NATURAL SOIL
			SPT 1.50 m 13, 15, 12 N = 27		 76.8	2					M (<pl)< td=""><td>VSt H</td><td></td><td></td><td>1.70: V-bit refusal</td></pl)<>	VSt H			1.70: V-bit refusal
			SPT 3.00 m 11/75mm N = R	ZZ	1 75.8	3-			SHALE; brownish grey, extremely very low strength becomes pale grey, highly weateh		-				2.80: Inferred BEDROCK, strength a weathering inferred from drilling resistance and cutting
					3 74.8	4					D				
					 72.8 73.8	5			becomes low strength						
					71.8										
AS - A RR - R WB- W	Vashl	Scre Rollei pore		rang ref	sistanc ing to usal	- -	⊻ Le > Inf ⊲ Pa ◀ Co	rtial Los mplete l	SPT - Standard Penetra	tion Test	<u> </u>	D M W	- Di - M - W	óist 'et i <u>mit</u>	n <u>Consistency/Relative Dens</u> VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose L - Loose
_	- Ca				Core indica Core	recover ates ma loss	red (ha terial)	atching	and Soil Descript Based on Unified Classification Sys	<u>tions</u> Soil		:	< PL = PL < PL		MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH29

Page 2 of 2

E	ngir	nee	ring	g Log - B	lor	ehc	ole				Project	No.:		PS	SM4	815	
	Client Projec Hole I Hole I	ct Na Loca	tion:	Edmon	ntial dsor	n Parl	k Sout	h, NS	W	lson Park South 76.1 m N MGA2020 Zone 56	Comme Comple Logged Checke	ted: By:	202 202				
	Drill M Hole I			I Mounting:	Cor	mmao	chio G	EO 3	05	Inclination: -90° Bearing:	RL Surf Datum:	8.80 m .HD Ope			perator: Matrix Drilling		
			Drilli	ing Informati	on					Soil Descrip	otion						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit	edding, ional	Moisture Condition	Consistency Relative Density	Pene	ocke etron UCS [kPa]	neter)	Structure and Additional Observations
						 69.8	- - - 9 - -			becomes low strength (continued)		(continu	led)				
AD/T						 68.8						м					10.00: Water Table
						 67.8	- 11 - - -					w					
						66.8	- 12 - - -			Target depth Hole Terminated at 12.00 m							
						 65.8	- 13— -										
						 64.8	- - 14 -										
						 63.8	- - 15 - - -										
		Metho Auger Rock F	Screv Roller	wing N	lo res rang ref	sistanc ing to usal	[⊻ Le > Inf ⊲ Pa ▼ Co	ntial Los omplete	SPT - Standard Penetra s	ple	Δ		- D - N - V	Dry Ory Noist Vet		Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable VL - Very Loose
		Suppo - Ca			<u>Gra</u>	Core	Log/Co recove ates ma loss	red (ha		<u>Classification Syn</u> and Soil Descript Based on Unified Classification Sys	<u>tions</u> Soil		-	< Pl = Pl < Pl	L		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ
H		}}}

BH30

En	ngin	iee	rin	g Log - E	Sor	eho	le				Project	No.:		PS	M4	815	
P H	Client Projec Hole L Hole F	t Na ₋oca	tion	Edmon	ntial dsoi	n Parl	Sout	h, NS	W	son Park South 74.3 m N MGA2020 Zone 56	Commenced:17/10/2Completed:17/10/2Logged By:DLChecked By:RS						
				d Mounting:						Inclination: -90°	RL Surf	80	.60 r				
H	lole [Bearing:	Datum:		AF	ID		0	perator: Matrix Drilling
			Drill	ling Informati	on					Soil Descrip	tion	-					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, B Plasticity, Sensitivity, Addit		Moisture Condition	Consistency Relative Density	Pene I (000	ocke tron JCS kPa	et neter ;)]	r Structure and Additional Observations
							_	<u> </u>	OL	TOPSOIL; Silty CLAY, low plasticit	y, dark		S			4 0	0.00: Inferred TOPSOIL, grassed surfa
				SPT 0.50 m 2, 13, 11/50mn N = R U50 0.50-1.00 m		79.6	- - 1		CI-CH	CLAY; medium to high plasticity, rebecomes pale grey	d brown	 (>PL)	St				1.15: SPT refusal
				SPT 2.00 m 5/90mm N = R		1 78.6	2-			SHALE, brownish pale grey, extre	nelv	M (<pl)< td=""><td>VSt</td><td></td><td></td><td></td><td>2.36: SPT refusal</td></pl)<>	VSt				2.36: SPT refusal
						1 77.6	- - 3- -			weathered, very low strength	inery						Inferred BEDROCK; strength and weathering inferred from drilling resistance and cutting
AD/T						1 76.6	4										
						1 75.6	- 5 - -			becomes pale grey, highly weathe strength	ed, low	D					
						 74.6	6										
						1 73.6	7										
R	Method <u>Penetration</u> AS - Auger Screwing RR - Rock Roller WB- Washbore refusal					⊻ Le ^v > Infl ⊲ Pa ■ Co	rtial Los mplete	SPT - Standard Penetra	ed Sample Sample Penetration Test				ondin Pry loist Vet		Consistency/Relative Densit VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard Fr - Friable		
		- Ca			<u>Gr</u> 	Core	Log/Co recover ites ma loss	red (ha		<u>Classification Synand Soil Descrip</u> and Soil Descrip Based on Unified Classification Sys	ions Soil			< PL = PL < PL	-		VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Ρ	S	Μ

BH30

Page 2 of 2

En	gin	ee	ring	g Log -	Bor	reho	ole				Projec	t No.:		PSI	/481	5
P H	lient: roject ole Lo ole P	ocat	ion:	Edmo	lential ondso	n Par	k Sou	th, NS	SW	lson Park South 74.3 m N MGA2020 Zone 56	Comm Compl Logge Check	d By:			0/20 0/20	
				Mounting:	•					Inclination: -90°	RL Su		80	.60 m	1	
	ole D			-						Bearing:	Datum		AH			Operator: Matrix Drilling
			Drilli	ng Informa	ation					Soil Descri	otion					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Fraction, Colour, Structure, E Plasticity, Sensitivity, Addi	edding, ional	Moisture Condition	Consistency Relative Density	Penet U (k	cket romete CS Pa)	Additional Observations
						71.6	9-			SHALE, brownish pale grey, extre weathered, very low strength <i>(cor</i> becomes medium weathered	tinued)	D(continu		5	040	
						70.6	10-									10.00: Water table, inferred from wet cuttings
						69.69	11					м				
						67.6 68.6	12			Target depth Hole Terminated at 12.10 m						
						66.6	- - - 14 -	-								
						65.6	- - - - - -									
R		očk F	Screv Roller		rang	tion sistand jing to fusal		⊻ Le ⊳ Inf ⊲ Pa	Mater Vel (Dat flow artial Los omplete	SPT - Standard Penetra s	ple	<u>Λ</u>	M W	- Dr - Ma - Wa	/ bist et	VS - Very Soft S - Soff F - Firm VSt - Very Stiff H - Hard Fr - Friable
	<u>Su</u> С -	i ppo - Ca			<u>G</u>	Core	ates ma	red (ha	<u>ss</u> atching	<u>Classification Sy</u> <u>and Soil Descrip</u> Based on Unified Classification Sy	<u>tions</u> Soil		<u>Plastic Limit</u> < PL = PL < PL			VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

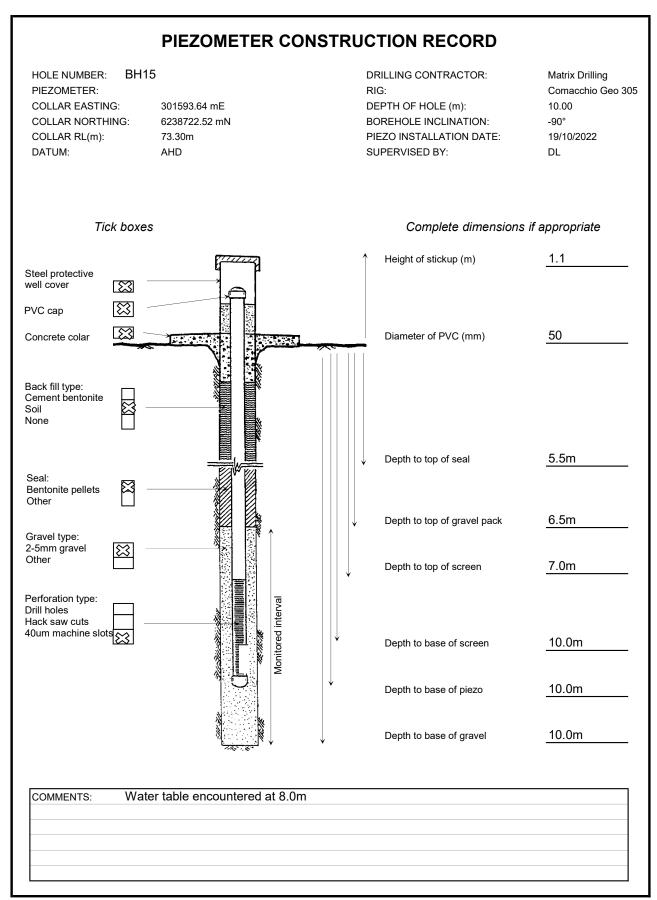
Appendix B Piezometer Construction Records

JOB no.: PSM 4815



Pells Sullivan Meynink Engineering Consultants Rock - Soil - Water

PROJECT: Edmondson Park South

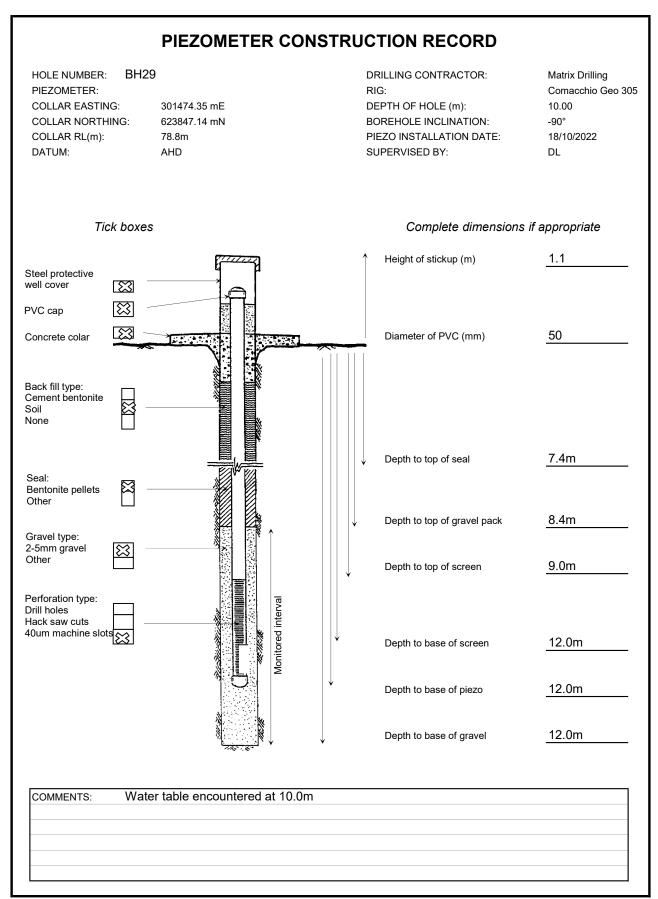


JOB no.: PSM 4815



Pells Sullivan Meynink Engineering Consultants Rock - Soil - Water

PROJECT: Edmondson Park South



JOB no.: PSM 4815

PROJECT: Edmondson Park South



PIEZOMETER CONSTRUCTION RECORD HOLE NUMBER: BH30 DRILLING CONTRACTOR: Matrix Drilling PIEZOMETER: RIG: Comacchio Geo 305 COLLAR EASTING: 301470.78 mE DEPTH OF HOLE (m): 10.00 COLLAR NORTHING: 6238374.25 mN BOREHOLE INCLINATION: -90° COLLAR RL(m): 80.6m PIEZO INSTALLATION DATE: 17/10/2022 DATUM: AHD SUPERVISED BY: DL Complete dimensions if appropriate Tick boxes Height of stickup (m) 1.1 Steel protective well cover \mathbb{S} ß PVC cap \mathbf{x} Diameter of PVC (mm) 50 Concrete colar Back fill type: Cement bentonite Soil None Depth to top of seal 7.5m Seal: \bowtie Bentonite pellets Other Depth to top of gravel pack 8.5m Gravel type: 2-5mm gravel Other 9.1m Depth to top of screen Perforation type: Monitored interval Drill holes Hack saw cuts 40um machine slots 12.1m Depth to base of screen 12.1m Depth to base of piezo Depth to base of gravel 12.1m COMMENTS: Water table encountered at 10.0m

Appendix C CBR Test Results
 115 Wicks Road

 Macquarie Park, NSW 2113

 Telephone:
 02 9888 5000

 Facsimile:
 02 9888 5001



FOUR DAY SOAKED CALIFORNIA BEARING RATIO TEST REPORT

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park
 Report No.:
 L4838 - 1

 Report Date:
 1/11/2022

 Page 1 of 1
 1

BOREHOLE NUM	BER	BH 01	BH 08	BH 11	BH 26	
DEPTH (m)		0.20 - 0.80	0.20 - 1.00	0.20 - 1.00	0.50 - 0.80	
Surcharge (kg)		4.5	4.5	4.5	4.5	
Maximum Dry Der	nsity (t/m³)	1.73 STD	1.79 STD	1.77 STD	1.74 STD	
Optimum Moisture	Content (%)	19.6	17.5	17.8	18.9	
Moulded Dry Dens	sity (t/m ³)	1.70	1.75	1.73	1.71	
Sample Density R	atio (%)	98	98	98	98	
Sample Moisture F	Ratio (%)	97	101	101	97	
Moisture Contents	i de la construcción de la constru					
Insitu (%)		18.5	20.2	18.6	19.0	
Moulded (%)		19.1	17.7	18.1	18.3	
After soaking	g and					
After Test, Top 30mm(%)		25.7	31.3	31.0	25.8	
	Remaining Depth (%)	17.6	20.2	22.9	20.4	
Material Retained on 19mm Sieve (%)		0	3*	0	0	
Swell (%)		0.5	4.0	3.5	0.5	
C.B.R. value:	@2.5mm penetration	2.5	1.0		3.5	
	@5.0mm penetration			1.0		

NOTES: Sampled and supplied by client. Samples tested as received.

• * Denotes not used in test sample.

- · Refer to appropriate Borehole logs for soil descriptions
- Test Methods : AS 1289 6.1.1, 5.1.1 & 2.1.1.
- Date of receipt of sample: 21/10/2022.



Number:1327

NATA Accredited Laboratory

Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

E 01/11/2022

Authorised Signature / Date (D. Treweek) Appendix D Atterberg Limits Test Results



MOISTURE CONTENT, ATTERBERG LIMITS AND LINEAR SHRINKAGE TEST REPORT

Client:	Pells Sullivan Meynink	Report No.:	L4838 - 3
PSM Job No.	: PSM4815 - Edmondson Park	Report Date:	4/11/2022
		Page 1 of 1	

AS 1289	TEST METHOD	2.1.1	3.1.2	3.2.1	3.3.1	3.4.1
BOREHOLE	DEPTH	MOISTURE	LIQUID	PLASTIC	PLASTICITY	LINEAR
NUMBER	m	CONTENT	LIMIT	LIMIT	INDEX	SHRINKAGE
		%	%	%	%	%
01	0.2 - 0.8	18.5	55	16	39	10.5*
08	0.2 - 1.0	20.2	50	17	33	10.5
11	0.2 - 1.0	18.6	56	16	40	13.0*
13	0.2 - 0.8	20.9	48	15	33	13.0
20	0.5 - 1.0	20.1	60	18	42	11.5**
21	0.5 - 1.0	18.5	40	13	27	11.5*
22	0.5 - 1.0	24.4	61	17	44	15.0
26	0.5 - 0.8	19.0	53	15	38	15.0

Notes:

• The test sample for liquid and plastic limit was air-dried & dry-sieved

• The linear shrinkage mould was 125mm

· Refer to appropriate notes for soil descriptions

• Date of receipt of sample: 21/10/2022.

• Sampled and supplied by client. Samples tested as received.

• * Denotes Linear Shrinkage curled.

• ** Denotes Linear Shrinkage cracked.



Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

4 04/11/2022 Authorised Signature / Date (D. Treweek)

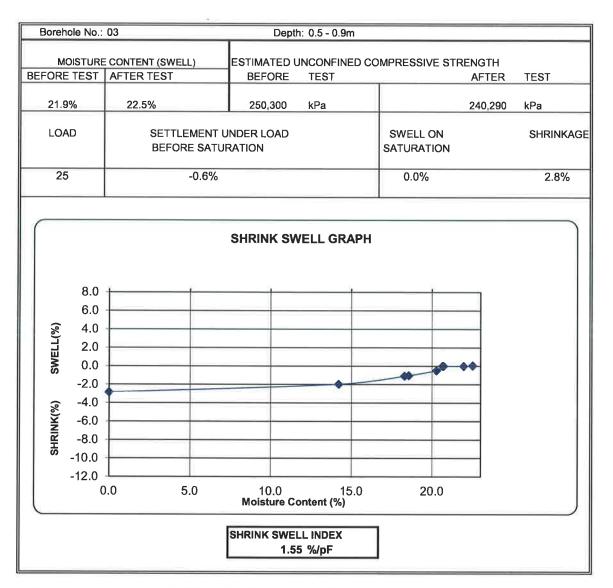
Appendix E Shrink Swell Test Results



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 1 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

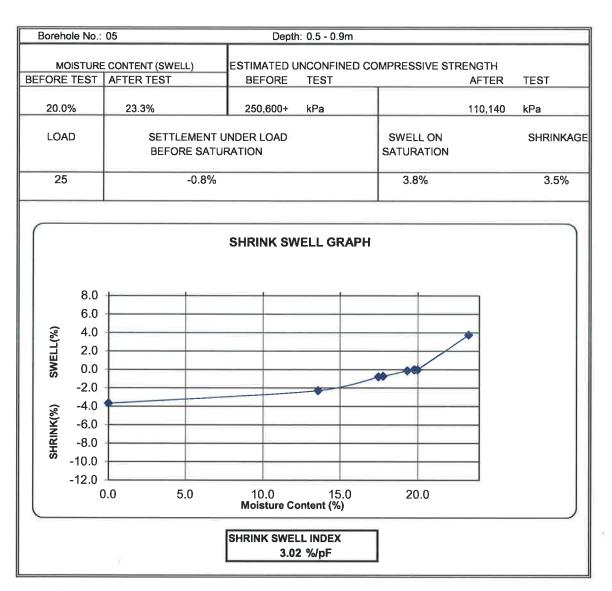


All services provided by STS are subject to our standard terms and conditions. A copy is available on request.



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park Report No.: L4838 - 2 Report Date: 3/11/2022 Page 2 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Number:1327

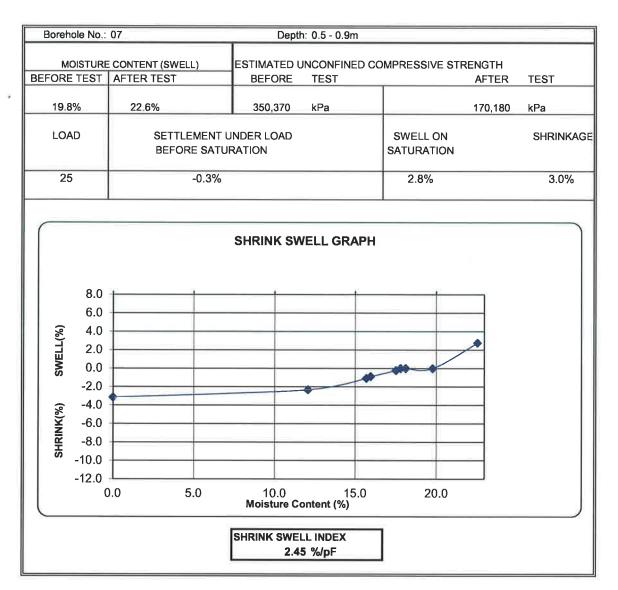
Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

Authorised Signature / Date (D. Treweek) 3/4/22



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park Report No.: L4838 - 2 Report Date: 3/11/2022 Page 3 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Number:1327

Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

Authorised Signature / Date 197 (D. Treweek) 3/11/22

All services provided by STS are subject to our standard terms and conditions. A copy is available on request.

 115 Wicks Road

 Macquarie Park, NSW 2113

 PO Box 976

 North Ryde, Bc 1670

 Telephone:
 02 9888 5000

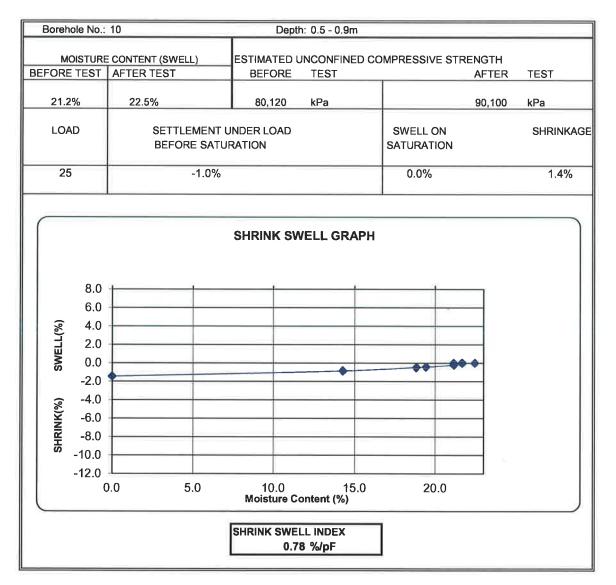
 Facsimile:
 02 9888 5001



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 4 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

Authorised Signature / Date (D. Treweek)

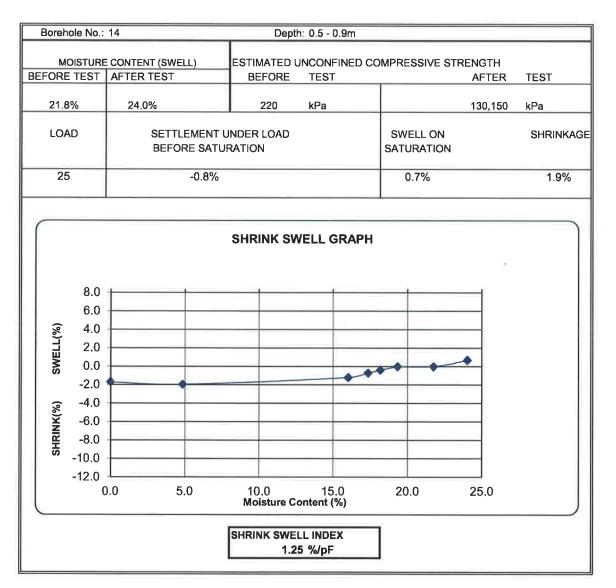
All services provided by STS are subject to our standard terms and conditions. A copy is available on request.



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 5 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = >5%
- · Shrinkage Cracking = Major crack.
- Soil Crumbling = none

d Laboratory

• Date of receipt of sample: 21/10/2022.



Number:1327

Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

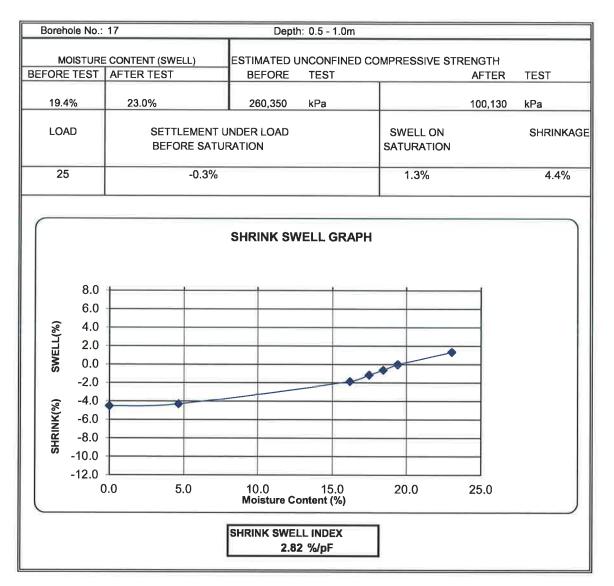
Authorised Signature / Date 1/3/11/22



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 6 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = >5%
- · Shrinkage Cracking = Major crack centre of sample.
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Number: 1327

Accredited for compliance with ISO/IEC 17025 - Testing. This document shell not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

Authorised Signature / Date (D. Treweek) 3/11/2.2

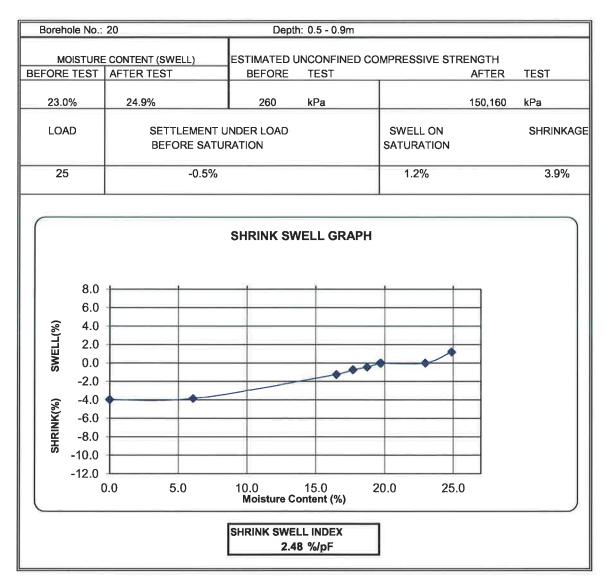
All services provided by STS are subject to our standard terms and conditions. A copy is available on request.



SHRINK - SWELL TEST REPORT TEST METHOD: AS1289 7.1.1

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 7 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

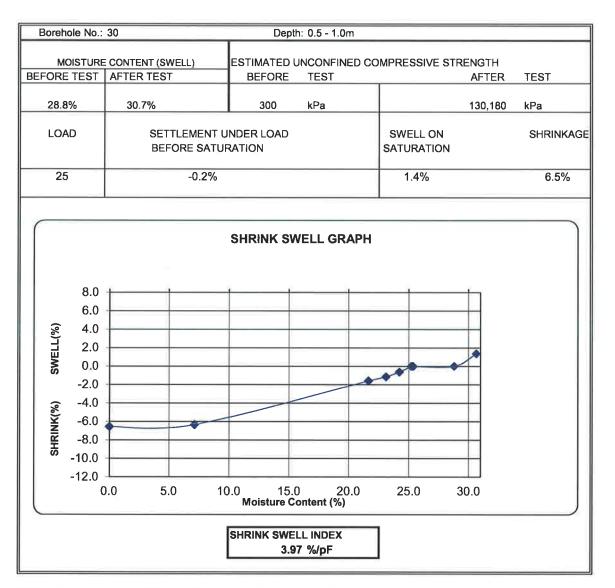
Authorised Signature / Date (D. Treweek) 3/11/2 2



SHRINK - SWELL TEST REPORT **TEST METHOD: AS1289 7.1.1**

Client: Pells Sullivan Meynink PSM Job No.: PSM4815 - Edmondson Park

Report No.: L4838 - 2 Report Date: 3/11/2022 Page 8 of 8



Notes: Sampled and supplied by client. Sample tested as received.

- Suction Value used in calculation = 1.8pF
- Volume Change Coefficient (α) was assumed = 2
- Visually estimated inclusions by volume = 0-5%
- Shrinkage Cracking = Moderate
- Soil Crumbling = none
- Date of receipt of sample: 21/10/2022.



Number:1327

NATA Accredited Laboratory

Accredited for compliance with ISO/IEC 17025 - Testing. This document shall not be reproduced except In full without approval of the laboratory. Results relate only to the items tested or sampled.

Authorised Signature / Day 11/22 (D. Treweek)

All services provided by STS are subject to our standard terms and conditions. A copy is available on request.

Appendix F Salinity and Aggressivity Test Results



CERTIFICATE OF ANALYSIS

Work Order	ES2237844	Page	: 1 of 4
Client	: PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD	Laboratory	Environmental Division Sydney
Contact	: MR ROHAN STOCKER	Contact	: Customer Services ES
Address	: G3, 56 DELHI ROAD	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	NORTH RYDE NSW, AUSTRALIA 2113		
Telephone	: +61 02 9812 5000	Telephone	: +61-2-8784 8555
Project	: PSM 4815	Date Samples Received	: 21-Oct-2022 09:00
Order number	: PSM 4815	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	:	Issue Date	: 01-Nov-2022 16:17
Sampler	: DENNIS LIM		
Site	:		
Quote number	: EN/333		Accreditation No. 825
No. of samples received	: 4		Accreditation No. 825 Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Nanthini Coilparampil	Laboratory Manager - Inorganics	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

* = This result is computed from individual analyte detections at or above the level of reporting

 \emptyset = ALS is not NATA accredited for these tests.

 \sim = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- ED007 and ED008: When Exchangeable AI is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCI Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + AI3+).

Page : 3 of 4 Work Order : ES2237844 Client : PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD Project : PSM 4815



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH 02	BH 12	BH 21	BH 27	
		Sampli	ng date / time	19-Oct-2022 11:00	20-Oct-2022 10:00	17-Oct-2022 09:00	17-Oct-2022 13:00	
Compound	CAS Number	LOR	Unit	ES2237844-001	ES2237844-002	ES2237844-003	ES2237844-004	
			-	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)								
pH Value		0.1	pH Unit	5.9	5.7	9.6	5.3	
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C		1	µS/cm	90	324	457	326	
EA055: Moisture Content (Dried @ 105	-110°C)							
Moisture Content		1.0	%	15.9	9.3	7.4	22.8	
EA080: Resistivity								
Resistivity at 25°C		1	ohm cm	11100	3090	2190	3070	
ED006: Exchangeable Cations on Alkal								
Exchangeable Calcium		0.2	meq/100g			2.7		
Exchangeable Magnesium		0.2	meq/100g			3.0		
Exchangeable Potassium		0.2	meq/100g			0.2		
Exchangeable Sodium		0.2	meq/100g			3.2		
Cation Exchange Capacity		0.2	meq/100g			9.1		
Exchangeable Sodium Percent		0.2	%			34.6		
ED007: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g	0.7				
Exchangeable Magnesium		0.1	meq/100g	6.7				
Exchangeable Potassium		0.1	meq/100g	0.2				
Exchangeable Sodium		0.1	meq/100g	1.3				
Cation Exchange Capacity		0.1	meq/100g	8.9				
Exchangeable Sodium Percent		0.1	%	15.0				
ED008: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g		<0.1		2.7	
Exchangeable Magnesium		0.1	meq/100g		4.5		6.1	
Exchangeable Potassium		0.1	meq/100g		0.3		0.2	
Exchangeable Sodium		0.1	meq/100g		1.7		1.6	
Cation Exchange Capacity		0.1	meq/100g		6.6		12.1	
Exchangeable Sodium Percent		0.1	%		26.0		13.1	
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	110	80	60	80	
ED045G: Chloride by Discrete Analyse	r							
Chloride	16887-00-6	10	mg/kg	370	440	350	420	

Page	: 4 of 4
Work Order	: ES2237844
Client	: PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD
Project	: PSM 4815

