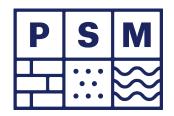
# Geotechnical Investigation Report

Elizabeth Enterprise Precinct (EEP) Stage 1 and 2 (1669 - 1723 Elizabeth Drive, Badgerys Creek)

PSM3530-018R Rev 4 4 March 2025

**Mirvac Industrial Developments** 



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# 1. Introduction

This report presents the results of a geotechnical investigation undertaken between 11 December 2023 and 08 January 2024 for the proposed Elizabeth Enterprise Precinct development. The work was undertaken in accordance with Item 1 – Fieldwork Option 1 of PSM's proposal (PSM3530-013L, dated 11 August 2023).

The aim of the geotechnical investigation was to assess the subsurface conditions and provide geotechnical advice for the proposed development to be constructed at the Site.

#### **1.1 Proposed Development**

PSM were supplied with the following documents prior to undertaking the investigation:

- Planning Secretary's Environmental Assessment Requirements (SEARs) for EEP Stage 1 (Ref: SSD-19618251 dated 31 August 2022)
- Draft EEP concept masterplan of Stage 1 and Stage 2 by SBA Architects (Ref: 20226 SK 66 Rev L dated 18 October 2023)
- Updated EEP SSDA (Stage 1) Architectural Drawings by SBA Architects (Ref: 20226 MP01 to MP23 dated 19 February 2025)
- Proposed borehole locations provided by Mirvac for the Site (Ref: SKC258 Stage 1+2 Concept Masterplan provided through Mirvac's email dated 11 August 2023)
- Earthworks Summary Report Report No. 11/0905, prepared by SMEC Testing Services, dated 22 August 2011.

Based on Mirvac's email dated 4 August 2023 and the provided documents, we understand the following:

- Additional geotechnical investigations are required for Stage 2 State Significant Development (SSD)
- Stage 2 SEARs are not currently available but it is expected to be similar to that of Stage 1
- The Site is expected to undergo cut and fill to construct the pads to their design final level. Based on the provided masterplans, we anticipate:
  - Cut: max 8-9 m at the western boundary adjacent to Elizabeth Drive, with retaining walls to be built
  - Fill: max 6-7 m at various locations.

Previously, PSM have completed the following:

• EEP Stage 1 Desktop Study and Results of Geotechnical Investigation (Ref: PSM3530-002L Rev 6 dated 30 September 2022).

This report has been prepared for SSDA submission purposes and provides geotechnical advice specific to the proposed development. A site locality plan has been included in Figure 1.

#### 1.2 Site Context

The site is located at 1669 -1723 Elizabeth Drive, Badgerys Creek, within the Penrith City Local Government Area (**LGA**). The site occupies multiple land allotments and is legally described as follows:

- Lot 99 and 100 in DP1283398 Stage 1 with an approximate area of 56.68 ha
- Lot 741 in DP810111 Stage 2 with an approximate area of 76.56 ha.

The site is bound by Elizabeth Drive to the south (primary frontage), Cleanaway Kemps Creek Resource Recovery Park to the west, rural properties to the north and South Creek to the east.

The site is currently occupied by the tenant, Kingsford Stud with 4 buildings. Majority of the Site comprises of grass fields used as grazing areas for horses.

A locality plan and aerial imagery is shown below in Figure 1.



# 2. Background

#### 2.1 Historical Site Usage

Historical usage of the site was discussed previously in PSM3530-002L Rev 6 dated 30 September 2022.

In particular, we note that between year 2009 and 2011 fill was placed on Site. According to STS report (Ref. 17210/8439B Report No. 11/0905 LWI/pi/ja), SMEC Testing Services undertook the Level 1 testing for the fill placement and the following was also reported in the STS report:

- The ground was stripped of topsoil and unsuitable material prior to placement of fill
- The fill material was assessed to be compacted to a minimum density ratio of 98% of standard maximum dry density with moisture content in the range of +/- 2% of the optimum moisture content.



#### Inset 1: NearMap aerial image of placed fill on 11 February 2011

#### 2.2 Geological Setting

The 1:100,000 Penrith Geological Map (1991) indicates the site is primarily underlain by:

- (Rwb) Bringelly Shale of the Wianamatta Group consisting of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff
- (Qal) fluvial fine-grained sand, silt and clay in areas close to South Creek and Kemps Creek.

Figure 2 presents a geological map of the site.

### 3. Geotechnical Investigation – December 2023

PSM undertook a geotechnical investigation on the site between 11 December 2023 and 08 January 2024.

Fieldwork took place under the fulltime supervision of a PSM geotechnical engineer who undertook the following tasks:

- Directing the investigation locations and drilling
- Preparing engineering logs of the material encountered
- Collection of soil samples for further testing
- Conducting point load testing on recovered rock samples.



Test locations were based on input by Mirvac for the Site (Ref: SKC258 – Stage 1+2 Concept Masterplan provided through email dated 11 August 2023). The elevation (RL) of each test location was approximated based on the contours provided within the same provided drawing.

Prior to carrying out testing, on-site service location "scans" were undertaken by a certified service locator to ensure the test locations were free from buried utilities.

Each of the holes were backfilled and fully reinstated on completion of testing.

Selected photographs of the site have been included in Appendix A.

#### 3.1 Boreholes

A total of thirty-five (35) boreholes were drilled using a track mounted drill rig:

- Seven (7) cored boreholes and
- Twenty-eight (28) augered boreholes.

All boreholes employed rotary auger drilling techniques, with SPTs taken at regular intervals. Bulk soil samples were retrieved directly from the auger, and SPT samples were retained for laboratory testing.

Point load index testing has been undertaken on the recovered rock cores at approximately 1 m intervals.

Borehole logs have been included in Appendix B.

#### 3.2 Laboratory Testing

#### 3.2.1 California Bearing Ratio (CBR) Testing

Four (4) bulk soil sample was recovered for CBR testing.

The following sample preparation was undertaken prior to CBR testing:

- Compact to 98% standard maximum dry density (SMDD), at optimum moisture content (OMC)
- Four (4) day soak; and
- 4.5 kg surcharge.

The geotechnical laboratory test certificate is included in Appendix C.

#### 3.2.2 Analytical Laboratory Testing

Ten (10) disturbed soil samples were recovered for testing by a NATA accredited analytical laboratory. The following tests were undertaken on the disturbed soil samples:

- Cation Exchange Capacity (CEC) of calcium, magnesium, potassium, and sodium
- Exchangeable sodium percentage
- Salinity (EC 1:5, one part soil to five parts water)
- Soil pH
- Chlorides
- Sulphates
- Resistivity.

Environmental laboratory test results are attached as Appendix D.



# 4. Site Conditions

#### 4.1 Surface Conditions

We note the following regarding surface conditions on the site:

- The surface predominantly consists of grassed and moderately vegetated areas with 4 existing structures. The land is currently being used as an equestrian facility with stable structures present.
- General waste and rubbish were observed on the surface near these structures.
- The regional topography grades downward towards groundwater bodies in the north-east, east. The surface elevation grades upwards from the site to the west.

#### 4.2 Subsurface Conditions

The subsurface conditions encountered within the boreholes are summarised in Table 1 below.

Table 1: Summary of Inferred Geological Units encountered in PSM boreholes

Inferred Geological Unit	Depth to Top of Geological Unit (Below Ground Surface (m))	Inferred Thickness (m)	Description
TOPSOIL	0	0.05 to 0.25	TOPSOIL: CLAY: high plasticity, brown to dark brown grey, rootlets observed
FILL	0 to 0.2	0.6 to 4.2	CLAY/ Gravelly CLAY: medium to high plasticity, pale brown to dark grey, gravel is sub-rounded to angular, up to 40 mm.
NATURAL SOIL	0.1 to 4.2	1.3 to 8.8	CLAY: high plasticity, brown grey to grey mottled red
BEDROCK A	2.2 to 8.0	0.2 to 3.7	SILTSTONE: grey to dark grey, extremely to moderately weathered, very low to low strength. LAMINITE: (60 to 70%) SANDSTONE and (30 to 40%) SILTSTONE, pale grey and yellow to brown, sandstone is medium grained, thinly laminated, extremely to highly weathered, very low strength.
BEDROCK B	3.2 to 9.6	N/A	SILTSTONE: grey to dark grey/ grey and brown, moderately to slightly weathered, with some highly weathered, low to medium strength. LAMINITE: (20 to 60%) SANDSTONE and (40 to 80%) SILTSTONE: pale grey to pale yellow/ grey and brown, sandstone is fine to medium grained, thinly to thickly laminated, moderately to slightly weathered, with some highly weathered, low to medium strength.

Table 2 shows the approximate elevation to the top of the inferred geotechnical units encountered in the boreholes. The borehole collar levels were estimated from the survey plan provided to PSM.



## Table 2: Elevation to the Top of Inferred Geological Units encountered in PSM Boreholes

STAGE 2	Elevation to Top of Unit (RL m AHD)											
Test ID	TOPSOIL	FILL	NATURAL SOIL	BEDROCK A	BEDROCK B	ЕОН						
BH01*	59.4	N/E	59.2	56.4	55.7	49.4						
BH02*	62.8	N/E	62.6	54.8	N/E	53.7						
BH03*	55.9	N/E	55.7	51.4	47.7	43.9						
BH04*	55.3	N/E	55.1	49.3	45.7	44.7						
BH05*	53.1	N/E	52.9	47.1	45.1	42.0						
BH06*	51.1	N/E	50.9	45.1	43.7	40.4						
BH07*	48.1	N/E	48.0	43.6	41.2	37.6						
BH08	40.8	N/E	40.6	36.3	N/E	34.8						
BH09	40.9	40.7	38.4	34.9	N/E	34.6						
BH10	N/E	41.7	38.2	N/E	N/E	35.3						
BH11	N/E	41.1	38.1	N/E	N/E	34.6						
BH12	N/E	43.1	38.9	N/E	N/E	35.1						
BH13	N/E	40.8	40.1	37.8	37.6 [1]	37.6						
BH14	N/E	42.5	38.5	N/E	N/E	36.1						
BH15	43.2	N/E	43.0	38.7	38.5 [1]	38.5						
BH16	40.0	39.8	38.5	32.2	N/E	32.0						
BH17	41.6	41.4	38.6	N/E	N/E	35.2						
BH18	42.9	N/E	42.7	38.4	38.0 [1]	38.0						
BH19	52.6	52.6	52.0	N/E	N/E	46.6						
BH20	49.3	N/E	49.1	44.8	44.5 <sup>[1]</sup>	44.5						
BH21	N/E	46.1	44.6	41.6	41.1 <sup>[1]</sup>	41.1						
BH22	N/E	41.7	38.7	35.7	N/E	35.4						
BH23	N/E	41.6	38.6	N/E	N/E	33.4						
BH24	N/E	42.2	39.2	N/E	N/E	35.8						
BH25	N/E	43.3	40.3	N/E	N/E	36.9						
BH26	N/E	44.7	44.0	N/E	N/E	38.2						
BH27	N/E	45.9	43.9	N/E	N/E	39.5						
BH28	49.6	N/E	49.5	N/E	N/E	43.6						
BH29	56.9	N/E	56.8	N/E	N/E	50.9						
BH30	53.5	N/E	53.4	N/E	N/E	46.0						
BH31	46.4	N/E	46.2	N/E	N/E	40.0						
BH32	48.1	N/E	47.9	N/E	N/E	41.7						



STAGE 2		El	evation to Top o	of Unit (RL m AH	D)	
Test ID	TOPSOIL	FILL	NATURAL SOIL	BEDROCK A	BEDROCK B	ЕОН
BH33	58.1	N/E	58.0	55.9	53.5 <sup>[1]</sup>	53.5
BH34	60.8	N/E	60.6	N/E	N/E	54.3
BH35	63.0	N/E	62.8	N/E	N/E	56.6

Notes:

EOH refers to End of Hole

N/E refers to Not Encountered

[1] BEDROCK B is based on TC-bit refusal

\* Rock coring was undertaken

#### 4.3 Groundwater

A standpipe piezometer was installed within BH02 and BH06 upon completion of drilling on 11 December 2023 and 13 December 2023. Drilling/coring water was bailed out from the standpipe piezometer following construction and a groundwater monitoring instrument, HOBO water logger was installed in each piezometer after that. Construction records of the piezometer is attached as Appendix B.

Groundwater was not observed at any of the holes during drilling.

We have also deployed two HOBOs water loggers to obtain ongoing groundwater level data in the piezometers. Based on the recorded data between 13 December 2023 and 1 February 2024, we note the following:

- The last steady groundwater level recorded in BH02 was approximately 59 m RL
- The last steady groundwater level recorded in BH06 was approximately 46.7 m RL.

Figure 3 and 4 presents the recorded water level/ rainfall vs dates.

# 5. Assessment of Laboratory Testing

#### 5.1 CBR Testing

Four (4) CBR test was undertaken within the NATURAL SOIL layer at BH04, BH08, BH21 and BH33. The results are presented in Table 3.

#### Table 3 – CBR Test Results

BH ID	MATERIAL DESCRIPTION	SOAKED CBR (%)	OPTIMUM MOISTURE CONTENT (%)	STANDARD MAXIMUM DRY DENSITY (t/m³)	SWELL (%)
BH04 (3 m to 4 m)	CLAY	1.5*	13.3	1.82	5.0
BH08 (0.5 m to 1 m)	CLAY	2.5*	17.5	1.74	2.5
BH21 (1.5 m to 2.5 m)	CLAY	1.0*	14.6	1.88	4.0
BH33 (1 m to 3.5 m)	CLAY	1.5*	17.5	1.75	5.0

Note: \* Indicates Soaked CBR value at 2.5mm penetration.



## 5.2 Soil Salinity and Aggressivity Investigation

The analysis of the salinity and aggressivity results are discussed in PSM353-020L dated 7 March 2024 (attached as Appendix D).

## 6. General

We have also prepared the following documents for the development:

- Interim Geotechnical Design Advice (IGDA), PSM3530-003L dated 3 March 2025 (attached as Appendix E)
- Bulk Earthwork Specification (BES), PSM3530-004S dated 3 March 2025 (attached as Appendix F).

If at any time, the conditions are found to vary from those described in this report, further advice should be sought.

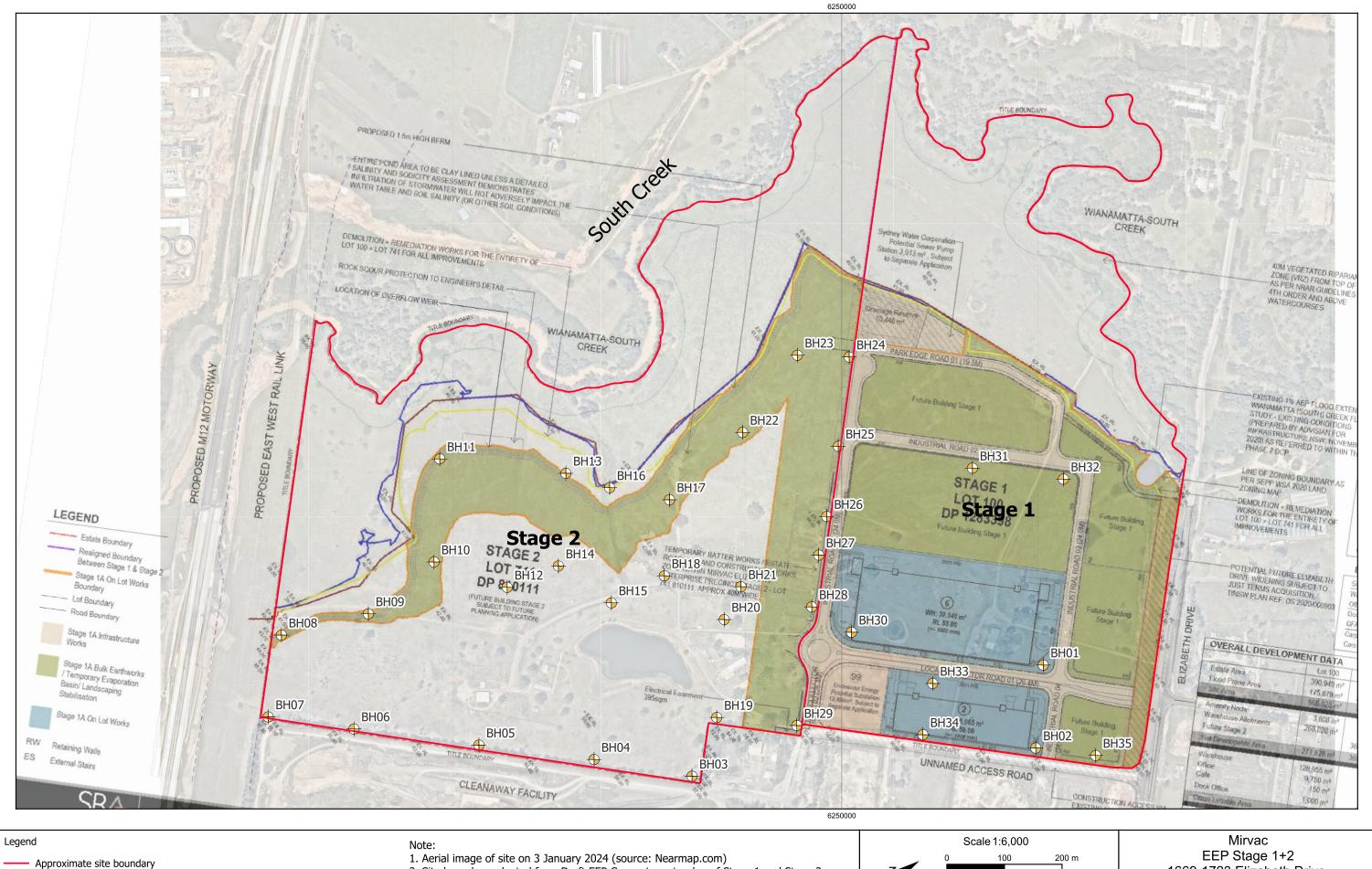
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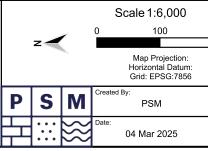
KELVIN LIM ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM PRINCIPAL



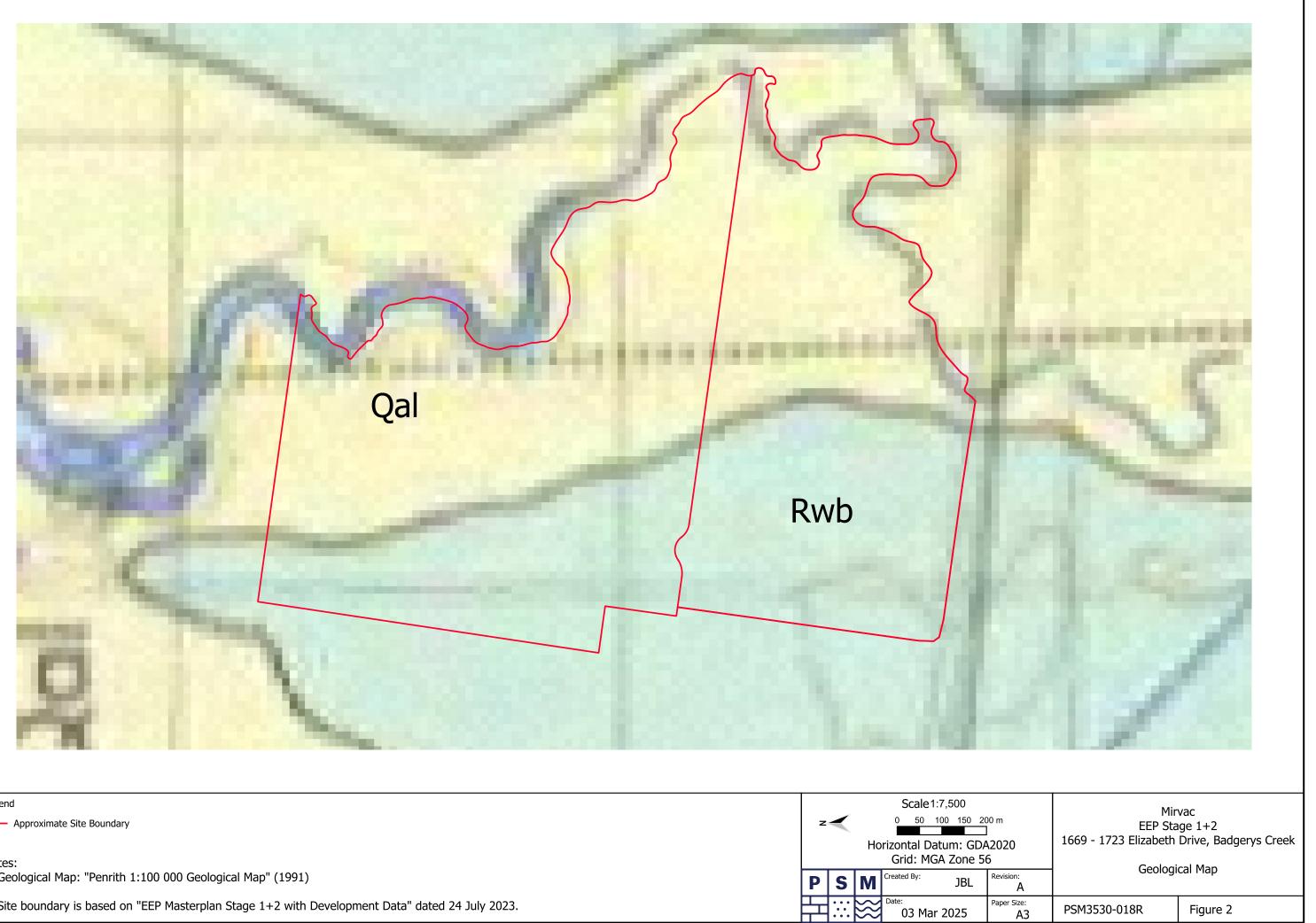


- - 2. Site boundary adapted from Draft EEP Concept masterplan of Stage 1 and Stage 2
  - 3. Overlaid site plan is from Stage 1 Masterplan "Estate Works Staging Plan Stage 1a"

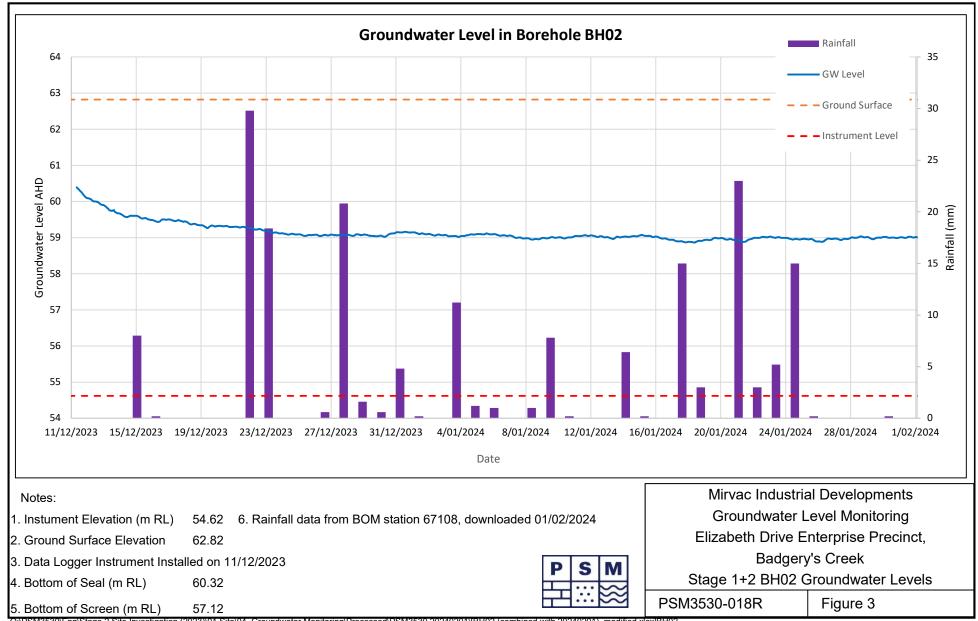


Approximate BH Locations

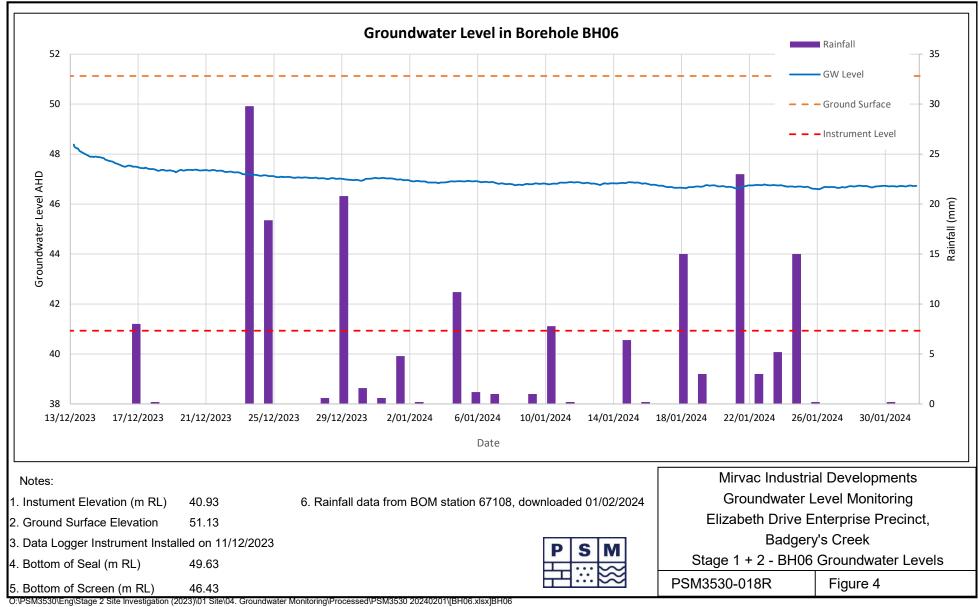
	1669-1723 Elizabeth Drive, Badgerys Creek								
Revision: A		SITE LOCA	LITY PLAN						
Paper Size: A3	;	PSM3530-018R	Figure 1						



Legend Approximate Site Boundary Notes: 1. Geological Map: "Penrith 1:100 000 Geological Map" (1991) 2. Site boundary is based on "EEP Masterplan Stage 1+2 with Development Data" dated 24 July 2023.



O:\PSM3530\Eng\Stage 2 Site Investigation (2023)\01 Site\04. Groundwater Monitoring\Processed\PSM3530 20240201\[BH02 (combined with 20240201)\_modified.xlsx]BH02



Appendix A Selected Site Photographs





Photo 1 - General Site Photo facing South from BH01



Photo 2 - General Site Photo facing North from BH02

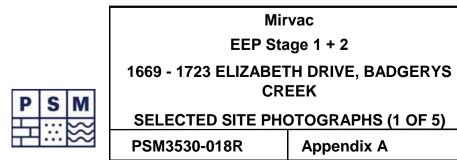




Photo 3 - General Site Photo facing North from BH03



Photo 4 - General Site Photo facing East from BH04

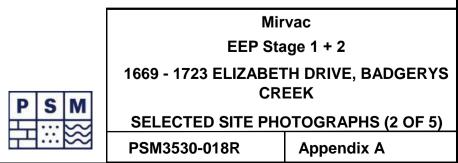




Photo 5 - General Site Photo facing South-West from BH12



Photo 6 - General Site Photo facing East from BH14





Photo 7 - General Site Photo facing West from BH17



Photo 8 - General Site Photo facing East from BH23

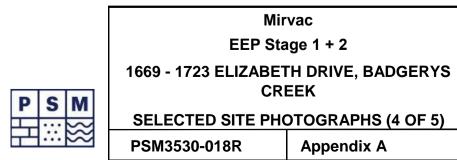




Photo 9 - Typical Drill Rig Set Up



Photo 10 - Typical Soil Profile Encountered



Appendix B Borehole Logs and Piezometer Construction



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Borehole ID

BH01

Page 1 of 3

Pro Ho	le L	t Na ocai osit	ion:	Refer to	eth E o PS	M353	30-018	R Fig	gure 1	A2020 Zone 56	Commen Complete Logged E Checked	ed: By:			2/202 2/202	
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Ho	le D	iam		ing Informat		5 mm				Bearing: Soil Desc	Datum:		AH	HD	0	perator: Matrix Drilling Observations
										Material Descriptio	-		/ isity			
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	SOIL NAME: Plasticity, bel particle characteristics of component, colour, secondary additional observatio	aviour or primary components, ns	Moisture Condition	Consistency Relative Der	Ha Peneti U (kl	and cometer CS Pa)	r Structure, Zoning, Origir Additional Observations
				SPT			-		СН	TOPSOIL: CLAY: high plasticity rootlets observed CLAY: high plasticity, brown gre						0.20: INFERRED NATURAL
		z		0.50-0.95 m 3,8,7 N=15			- - 1									
		z		SPT 1.50-1.95 m 2,10,12 N=22		 57.4	- - 2 -					D	VSt			
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Borehole ID

BH01

Page 2 of 3

Enç	gir	nee	ring	Log	j - C	ore	d B	orehole		Project N	o.: F	ـــــ SM3530	
Cli	ient	ŀ		Mi	rvac					Commen	ced: 1	1/12/2023	
			ame:			h Ente	erpris	e Precinct		Complete		1/12/2023	
	-		tion:					018R Figure 1		Logged E		BL	
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Dr	ill N	Лоde	and M	ounti	ng:	Coma	acchic	Geo 305 Inc	lination: -90°	RL Surfa	ce: 59.40	) m	
Ba	rre	l Typ	e and L	.engtl	h:	3 m		Ве	aring:	Datum:	AHD	Ope	rator: Matrix Drilling
		Drill	ing Info	rmat	ion			R	ock Substance			F	Rock Mass Defects
Method	vv ater	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material De ROCK NAME: particle/, colour, fabric/texture, components, moisture, mine	grain characteristics, inclusions or minor ral composition, alteration	Weathering	Strength Is(50) • - Axial O - Diametral	Defect Spacing (mm)	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
		F			57.4 58.4					MW       MW <td< th=""><th></th><th></th><th></th></td<>			
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	ADA WB HQ3 PQ3 SPT PT WP1	Γ-Aug - Wa - Win - Win - Star - Pus Γ-Wat	ethod ar drilling T ar drilling V shbore eline core (i eline core (i ndard pene h tube ter pressure nce with AS 1	' bit 63.5 mr 85.0 mr tration † e test	m) test	Graj	<ul> <li>&gt; Inflo</li> <li>□ Part</li> <li>■ Corr</li> <li>■ Core</li> <li>□ Core</li> <li>□ Indica</li> <li>□ No co</li> </ul>	al Loss plete Loss <b>og/Core Loss</b> recovered (hatching ites material) re recovery	Weathering           XW - Extremely Weathered           HW - Highly Weathered           MW - Moderately Weathered           Slightly Weathered           FR - Fresh           Strength           VL - Very Low           L - Low           M - Medium           H - High           H - High           E - Extremely High	FT - Fau SS - She SZ - She	ar Surface ar Zone ding parting m ed Seam t tact shed Zone ture Zone ding Shear	Infilling/Coa CN - Clean CN - Clean SN - Stain VN - Veneer CO - Coating RF - Rock fr; G - Gravel S - Sand Z - Silt CA - Calcite CL - Clay FE - Iron QZ - Quartz X - Carbon:	SL - Slickensided POL - Polished S - Smooth RF - Rough VR - Very Rough <b>Shape</b> PR - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular

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Borehole ID

BH01

Page 3 of 3

Pro Ho	ole	t: ct Na Loca Posit	ition:	Eli: Re	efer to	PSM	3530	e Precinct 018R Figure 1 9650.0 m N MGA2020 Zone	9 56	Commence Complete Logged By Checked I	d: 1 y: J	1/12/2023 1/12/2023 BL \S	
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			ing Info	-					k Substance	Datam			Rock Mass Defects
Method	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Descri ROCK NAME: particle/grai colour, fabric/texture, incl components, moisture, mineral d	n characteristics, usions or minor		Strength Is(50) - Axial - Diametral	Defect Spacing (mm)	Defect Descriptions / Commen Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
		77	Is(50) d=0.17 a=0.13 MPa Is(50) d=0.14 a=0.16 MPa		52.4 53.4			SILTSTONE: grey, extremely to thinly laminated <i>(continued)</i> Becomes slightly weathered	highly weathered,				- JT, 70°, CL VN, PR, S - RF, 20 mm - JT, 70°, CL VN, S
NMLC	75-100% Water RETURN	87	Is(50) d=0.14 a=0.16 MPa Is(50) d=0.14 a=0.40 MPa		.4 51.4	8		LAMINITE: 70% SILTSTONE, 3 pale grey and yellow, sandstone thinly laminated SILTSTONE: dark grey, slightly laminated	e is medium grained,				— BP, 5°, CN, CU, S — JT, 60°, RF, PR, S — JT, 85°, PR, ST, S
		T - Aug	Is(50) d=0.01 a=0.05 MPa Is(50) d=0.04 MPa Is(50) a=0.09 MPa ethod er drilling T		50.4	9	W - Inflo	Hole Terminated at 10.00 m Target depth ater	Weathering W - Extremely Weathered W - Highly Weathered	I         I           I         I		I         I           I         I	- BP, 5°, CL VN, UN, S ting <u>Roughness</u> SL - Slickensided POL - Polished
	WB HQ3 PQ3 SPT PT	- Was 3- Wire 3- Wire - Star - Pus	eline core ( eline core ( ndard pene	63.5 mr 85.0 mr tration t	n)		Com Core indica	plete Loss precovered (hatching L tes material) H re recovery VI	Strength - Very Low - Low - Medium - High	SZ - Shea BP - Bedd SM - Seam IS - Infille JT - Joint CO - Conta CZ - Crush VN - Vein FZ - Fract	ing parting d Seam act aed Zone	VN - Veneer CO - Coatinç RF - Rock fr G - Gravel S - Sand Z - Silt CA - Calcite CL - Clay FE - Iron QZ - Quartz	RF - Rough



PSM3530-018R

Appendix B



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Borehole ID

BH02

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'n	qir	iee	rir	ng Log - I	Non	ı Co	ored	Во	reho	le	Project N	No.:		PS	SM3	L 530	Page 1 of 3
C Pi H	lient rojec ole L ole F	: ct Na	ame	Mirvac Elizabe Bi Refer t	eth Ei o PS	nterp M353	rise Pr 30-018	recino IR Fig	ct gure 1	A2020 Zone 56	Commer Complete Logged I Checked	nced: ed: By:					
				nd Mounting:	Cor	naccl	hio Ge							.80	m		Norston Motrix Drilling
H		Jiar	Diameter: Drilling Information						Bearing: Datum Soil Description					HD		0	operator: Matrix Drilling Observations
Т										-	puon		iţ				Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary c additional observation	rimary omponents,	Moisture Condition	Consistency / Relative Density	Pene	Hand etron UCS (kPa	netei S )	r Structure, Zoning, Origin Additional Observations
									СН	TOPSOIL: CLAY: high plasticity, to red, rootlets observed		D					
		         z		SPT 0.50-0.95 m 2,5,5 N=10			-		СН	CLAY: high plasticity, grey mottled	d red		St				0.20: INFERRED NATURAL
					-	 61.8	1										
				SPT 1.50-1.95 m 4,11,14 N=25	-	60.8	- - 2 -					М	VSt				
				SPT 3.00-3.45 m 6,12,23 N=35	-	- 59.8	3						— — Н				
						58.8	- - 4 -			Continued on cored borehole she	et						
	D/T - D/V - /B - PT - T - S -	Wa Sta Pus Aug	er di er di shbo ndaro h tub er so	d penetration tes	it No	Re	stance efusal		⊳ Infle ⊲ Par	ater Samples al w U - Undisturbed bu D - Disturbed Sa D - Disturbed Sa SPT - Standard Pe mplete Loss ES - Environment TW - Thin Walled LB - Large Distur	Sample ample netration Test al Sample		loistu D M W	re Co - [ - N / - V	Dry ∕loist		Consistency/Relative Dens         VS       - Very soft         S       - Soft         F       - Firm         St       - Stift         VSt       - Very stift         H       - Hard         VL       - Very loose         L       - Loose         MD       - Medium dense         D       - Dense         VD       - Very dense         Ce       - Compact

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Borehole ID

**BH02** 

Page 2 of 3

P	-	ct Na	ame:	Eli				e Precinct			Commen Complete	ed: 1	1/12/2023 1/12/2023	
		Loca Posi	ation: tion:					-018R Figure 1 9663.0 m N MGA2020 2	Zone 56		Logged B Checked		BL \S	
D	Drill N	Node	and M	ounti	ng:	Coma	cchic	Geo 305 In	clination: -	90°	RL Surfac	ce: 62.80	) m	
В	Barre	el Typ	be and L	.engtl	า:	3 m		B	earing:		Datum:	AHD	Ope	rator: Matrix Drilling
		Drill	ling Info	ormat	ion				Rock Substan	nce			F	Rock Mass Defects
INIEILIOU	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material D ROCK NAME: particle colour, fabric/texture components, moisture, min	/grain characteri , inclusions or mi	istics, inor , alteration	Weathering ≳ ≩ ≩ ≳ ⊮	Strength Is(50) ● - Axial O - Diametral	Defect Spacing (mm)	Defect Descriptions / Comme Description, alpha/beta, infilli or coating, shape, roughnes thickness, other
					60.8 61.8	- - - 1 - - - - - - - - - - - - -								
					59.8	- - 3								
INVICO	75-100% Water RETURN	0			58.8	4		Continued from non-cored CLAY: high plasticity, grey						
	AD/ WB HQ3 PQ3 SPT PT	T-Aug V-Aug - War 3- Win 3- Win - Star - Pus	ethod yer drilling T yer drilling V shbore eline core (i eline core (i endard pene sh tube	/ bit 63.5 mr 85.0 mr tration f	n)	<	> Inflo ☐ Parti ■ Com ohic L Core indica	ater w ial Loss plete Loss og/Core Loss recovered (hatching ites material) per recovery	Weatheri           XW - Extremely           HW - Highly WW           MW - Moderatel           SW - Slightly W           FR - Fresh           VL - Very Low           L - Low           M - Medium           H - High           VH - Very High	r Weathered eathered ly Weathered /eathered	FT - Faul SS - Shea SZ - Shea	ar Surface ar Zone ding parting m ed Seam t tact shed Zone	Infilling/Coa CN - Clean SN - Stain VN - Veneer CO - Coating RF - Rock fr G - Gravel S - Sand Z - Silt CA - Calcite CL - Clay FE - Iron	SL - Slickensided POL - Polished S - Smooth agments VR - Rough Shape PR - Planar

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Borehole ID

BH02

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Engi	nee	ring	Log	1 - C	ore	d Bo	orehole	Projec	t No.:	PSM35	ـــــــــــــــــــــــــــــــــــــ	Fage 3 01 3
Clier Proje Hole		ame: ation:	Mi Eli Re	irvac izabel efer to	th Ente PSM	erpris 3530-	e Precinct 018R Figure 1 9663.0 m N MGA2020 Zone 56	Comm Compl Logge Check	d By:	11/12/20 11/12/20 JBL AS		
		el and M					Geo 305 Inclination: -90°	RL Su	-	80 m		
		be and L		-	3 m		Bearing:	Datum			Ope	rator: Matrix Drilling
	Drill	ling Info	ormat	tion			Rock Substance				F	Rock Mass Defects
Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteratio	Weatheri	O - Diametra		ing າ)	Defect Descriptions / Comment Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
NMLC 75-100% Water RETURN	94 0			1 55.8 56.8	- - - - - - - - - - - - - - - - - -		CORE LOSS <i>(continued)</i>					
		ls(50) d=0.1 a=0.02 MPa ls(50) d=0.06 MPa		53.8 54.8	 8    9		SILTSTONE: grey and brown, extremely to highly weathered, thinly laminated Hole Terminated at 9.10 m					8.00: INFERRED BEDROCK — BP, 3°, RF, PR, S — BP, 5°, CL CO, PR, S → BP, 5°, CN, PR, S — CZ
AD WE HQ PQ SP PT WF	/T-Aug /V-Aug 3-Wa 23-Win 23-Win 23-Win T-Stau -Pus PT-Wa	eline core ( eline core ( ndard pene	/ bit 63.5 mi 85.0 mi stration e test	m) test	Graj	<ul> <li>&gt; Inflor</li> <li>□ Parti</li> <li>■ Com</li> <li>□ Dhic Lo</li> <li>□ Core</li> <li>□ Indica</li> <li>□ No co</li> </ul>	Target depth         ater       Weathering         w       Extremely Weathered         al Loss       HW - Highly Weathered         al Loss       WW - Moderately Weathered         plete Loss       SW - Silghtly Weathered         pog/Core Loss       Fresh         recovered (hatching tes material)       L       Low         H       High         Heigh       Heigh         Fre excovery       VH - Very High         Fe       Fetsherek High	FT - SS - SZ - SM - IS - SM - IS - CO - CZ - VN - FZ - BSH -	Shear Surface Shear Zone Bedding parting Seam Infilled Seam Joint Contact Crushed Zone	CO - RF - G - S - Z - CA - CL - FE - QZ -	Clean Stain Veneer Coating Rock fra Gravel Sand Silt Calcite Clay Iron	SL - Slickensided POL - Polished S - Smooth RF - Rough VR - Very Rough <b>Shape</b> PR - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular



Š	PSM3530-018R
$\sim$	PSM3530-018R

Appendix B



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Borehole ID

BH03

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P H	lient: rojec lole L lole F	t Na .oca	tion:	Refer t	eth E o PS	M35	30-018	R Figure 1Logged By:0.0 m N MGA2020 Zone 56Checked By:							/12/ L	202	
	Drill Model and Mounting: Comacchio ( Hole Diameter: 125 mm							o 30	5	Inclination: -90° Bearing:	RL Surfac	ce:	55 A⊢	.90 i ID	m	0	perator: Matrix Drilling
		Drilling Information							Soil Descript	ion						Observations	
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavi particle characteristics of prin component, colour, secondary con additional observations		Moisture Condition	Consistency / Relative Density	Pene	Hance tron UCS	neter ; )	Structure, Zoning, Origin, Additional Observations
		z	-	SPT 0.50-0.95 m 2,15,35			-		СН	TOPSOIL: CLAY: high plasticity, bro rootlets observed							0.25: INFERRED NATURAL
				N=50		54.9	1					D	н				
				SPT 1.50-1.95 m 3,3,5 N=8		53.9	2-			Becomes brown			 St				
		z		SPT	~~~	 52.9				Becomes grey	-	D to M					
				3.00-3.45 m 7,20,29 N=49		4	-						н				3.30: Layer of ironstone observe in S sample
						51.9	4					D					
		letho		SPT 4.50-4.87 m 10,35,21/70mr HB N=R	Po	netrat			14	SILTSTONE: extremely weathered, as CLAY: high plasticity, grey and b	rown					fier	4.50: INFERRED BEDROCK
Al Al SI P A C	D/T - D/V - /B - PT - T -	Aug Aug Was Star Pusl	er dril er dril hbore dard n tube	ling TC bit ling V bit e penetration tes e ewing us push tube 1.	t	o resis	stance		⊳ Infl ⊲ Par		ample ple tration Test Sample	~	D M	- [ - N - V	)ry ⁄loist		VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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Borehole ID

BH03

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Client: Projec Hole L Hole F	ct Na ₋oca	tion:	Refer to	o PS	M353	30-018	R Fig	jure 1	A2020 Zone 56	Comme Complet Logged Checked	ed: By:					
Drill M Hole D			d Mounting:		nacc mm	hio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	55 AF	.90 HD	m	Op	perator: Matrix Drilling
	Drilling Information								Soil Descr							Observations
Penetration	Support	Water	Samples Tests			Graphic Log	Classification Symbol	SOIL NAME: Plasticity, beh particle characteristics of	Material Description		Condition Condition Construct Constr			eter	er Structure, Zoning, Origin, Additional Observations	
	Z		SPT 6.00-6.30 m 3,38 HB N=R ES 6.00 m		48.9 49.9				SILTSTONE: extremely weather as CLAY: high plasticity, grey an <i>(continued)</i>		D					
					46.9 47.9				Continued on cored borehole sh							
AD/T - AD/V - WB - SPT - PT - AS -	Auge Auge Was Stan Push	er dril er dril hbore dard n tube er scr	penetration test		R	stance efusal		$>$ Inflo $\lhd$ Par	ater Samples a ow U - Undisturbed S tial Loss D - Disturbed S mplete Loss ES - Environmer TW - Thin Wallec LB - Large Distu	d Sample ample enetration Tes ntal Sample I		M	re Ca - E - N / - V	Dry Noist	ion	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cermented C - Compact

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Borehole ID

BH03

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=nai	nee	rina	ا مم	- C	ore	d Be	orehole		Project N	lo.: F	PSM3530	Page 3 of 4
Engineering Log - Cored Bord         Client:       Mirvac         Project Name:       Elizabeth Enterprise P         Hole Location:       Refer to PSM3530-018         Hole Position:       292995.0 m E 6250266							prise Precinct			iced: 2 ed: 2 By: 3	12/12/2023 12/12/2023 JBL AS	
Drill Model and Mounting: Com						acchio Geo 305 Inclination: -90° Bearing:			RL Surfa			rotor: Motrix Drilling
Barrel Type and Length: 3 m Drilling Information				3 m			Datum:	AHD	O Operator: Matrix Drilling Rock Mass Defects			
						Rock Substance				Strength		
Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material De ROCK NAME: particle/ colour, fabric/texture, components, moisture, mine	grain characteristics, inclusions or minor	Weathering ≳ ≩ ≩ ≳ ⊮	ls(50) ● - Axial ○ - Diametral <sup>5</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>6</sup> <sup>9</sup> <sup>5</sup> <sup>1</sup> <sup>5</sup> <sup>1</sup> <sup>5</sup> <sup>1</sup> <sup>5</sup> <sup>5</sup> <sup>1</sup> <sup>5</sup>	Defect Spacing (mm) <sup>№</sup> <sub>8</sub> <sup>№</sup> <sup>00</sup>	Defect Descriptions / Commen Description, alpha/beta, infilling or coating, shape, roughness thickness, other
				49.9	- - 6 - -							
RETURN	80	Is(50) d=0.1 a=0.09 MPa Is(50) d=0.15 a=0.2 MPa ethod Is(10) shbore ethod Is(10) shbore ethod Is(10) shbore ethod Is(10) shbore ethod Is(10) shbore ethod Is(10) shbore sh		47.9 48.9	7		Continued from non-cored to SILTSTONE: grey and brow weathered, thinly laminated	vn, extremely to highly				BP, 0°, CN, PR, S ¬-BP, 0°, CL VN, PR, S 
NMLC 75-100% Water	88	ls(50) d=0.1 a=0.09 MPa		- 46.9	9_							—BP, 0°, CN, PR, S —BP, 5°, CL VN, UN, S
AD AD WE HQ PQ SP PT WF Logged in	Ma /T - Aug /V - Aug 3 - Wa 3 - Win 3 - Win 3 - Win 3 - Win 3 - Win 7 - Stal - Pus PT - Wa accorda	Is(50) d=0.15 a=0.2 MPa ethod ger drilling V shbore eline core ( eline core ( eline core ( ndard pene- th tube ter pressure nce with AS -	C bit / bit 63.5 mr 85.0 mr tration t e test 1726:201	n) n) rest 7 Geoteo	Gray	Viii     Inflor     Parti     Com     Core     indica     No cc     investig	ater w al Loss plete Loss og/Core Loss recovered (hatching tes material) re recovery ations	Weathering           XW         - Extremely Weathered           HW         - Highly Weathered           MW         - Moderately Weathered           SW         - Siightly Weathered           FR         - Fresh           Strength         - Low           M         - Medium           H         - High           VL         - Very Low           L         - Low           H         - High           VH         - Very High           EH         - Extremely High	FT - Fau SS - She BP - Bed SM - Sea IS - Infill JT - Joir CO - Con CZ - Cru VN - Veir FZ - Frav	ear Surface lading parting im led Seam nt tact shed Zone n cture Zone lding Shear	Infiling/Coc CN - Clean SN - Stain VN - Veneer CO - Coatin RF - Rock fr G - Gravel S - Sand CA - Calcite CL - Clay FE - Iron QZ - QuartZ X - Carbor	SL - Slickensided POL - Polished S - Smooth agments VR - Very Rough <b>Shape</b> PR - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular

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Borehole ID

BH03

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Client:MirvacProject Name:Elizabeth Enterprise PrecinctHole Location:Refer to PSM3530-018R FigHole Position:292995.0 m E 6250260.0 m					zabet				Commer Complet	ed: 1	2/12/2023 2/12/2023 BL	
								0260.0 m N MGA2020 Zone 56	• • •			
			and M		•		cchic	Geo 305 Inclination: -90°	RL Surfa			
Barrel Type and Length: 3 m			3 m		Bearing:	Datum: AHD		Operator: Matrix Drilling				
Drilling Information				ion			Rock Substance			Rock Mass Defects		
INIELIIOU	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration	Weathering ≳ ≩ ≩ § ∰	Strength Is(50) ● - Axial O - Diametral	Defect Spacing (mm)	Defect Descriptions / Comme Description, alpha/beta, infilli or coating, shape, roughnes thickness, other
	75-100% Water RETURN	88	ls(50) d=0.21 a=0.3 MPa		 44.9	- - - 11 -		SILTSTONE: grey and brown, moderately weathered, thinly laminated				− BP, 0°, CN, PR, S, 5 mm − BP, 0°, RF, UN, S, 10 mm − BP, 10°, CN, ST, S
			ls(50) d=0.34 a=1.65 MPa		43.9	- - - - - -		LAMINITE: 70% SANDSTONE, 30% SILTSTONE, pale grey and yellow, slightly weathered, fine grained, thinly laminated Hole Terminated at 12.00 m Target depth				— BP, 5°, CN, CU, S
					 42.9	- 13						
					41.9	- 14 - -						
	AD/	T - Aug	e <b>thod</b> er drilling T er drilling V shbore				> Inflo	al Loss MW - Moderately Weathered	FT - Fau SS - Shu SZ - Shu	ear Surface ear Zone	Infilling/Coa CN - Clean SN - Stain VN - Veneer	SL - Slickensided POL - Polished S - Smooth
	HQ: PQ: SP1 PT	3- Wire 3- Wire 1- Star - Pus	eline core ( eline core ( ndard pene	85.0 mr tration t	n)		<b>bhic L</b> Core	SW         Slightly Weathered           FR         - Fresh           og/Core Loss         Strength           vL         - Very Low           recovered (hatching         L           tes material)         M           H         - High	SM - Sea IS - Infi JT - Joi CO - Coi	lled Seam nt ntact ushed Zone	CO - Coating RF - Rock fra G - Gravel S - Sand Z - Silt CA - Calcite CL - Clay	



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Pi H	lient: rojec ole L ole F	t Na .oca	tion	Refer t	o PS	M353	30-018	R Fiq	gure 1	Comr Comp Logge A2020 Zone 56 Check	eted: d By:			2/202 2/202	
	rill M ole D			d Mounting:		nacc i mm	hio Ge	o 30	5	Inclination: -90° RL Su Bearing: Datum			55.30 m AHD		perator: Matrix Drilling
			Dril	ling Informat						Soil Description					Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components additional observations	, Moisture	Consistency /	Relative Density 100 An	and rometer CS Pa)	- Structure, Zoning, Origin Additional Observations
		z		SPT 0.50-0.95 m 3,7,9 N=16			-		СН	TOPSOIL: CLAY: high plasticity, brown, rootlets observed CLAY trace gravel: high plasticity, brown and grey, gravel is sub-angular up to 5 mm					0.20: INFERRED NATURAL
						54.3	1		СН	CLAY: high plasticity, grey and brown					
				SPT 1.50-1.95 m 4,11,14 N=25			2			Ironstone bands encountered between 1.6 n and 1.8 m	n		St		
		z		SPT 3.00-3.45 m 6,11,17 N=28 CBR 3.00-4.00 m		 51.3 52.3			СН	CLAY: high plasticity, grey mottled red	D1				
	M D/T -	letho Auge	o <b>d</b> Per dri	SPT 4.50-4.95 m 8,11,22 HB N=33	Pe	netrat			CH ▷ Infl	CLAY with gravel: high plasticity, grey mottle red, gravel is sub-angular up to 4 mm of siltstone origin ater Samples and Tests ow U - Undisturbed Sample					Consistency/Relative Den
vv	из - РТ - Г - S -	Was Stan Pusł Auge	hbor dard htub er sc	penetration tes		R			Par	ow U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration T mplete Loss ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample			M - Mo W - We	ist	VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented

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Borehole ID

**BH04** 

Client: Project Na Hole Loca Hole Posi	tion:	Refer to	o PS	M353	30-018	R Fig	jure 1	A2020 Zone 56	Commer Complet Logged Checked	ed: By:			2/202	
Drill Mode Hole Diam		d Mounting:		nacc mm		o 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	55 A⊢	.30 m ID		perator: Matrix Drilling
	Drill	ing Informati	on					Soil Descrip	tion					Observations
Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of pri component, colour, secondary co additional observations	mary mponents,	Moisture Condition	Consistency / Relative Density	Ha Peneti U (k	and rometer CS Pa)	r Structure, Zoning, Origin, Additional Observations
Z		SPT 6.00-6.30 m 6,31 HB N=R SPT 7.50-7.80 m 6,37 HB N=R		47.3 48.3 49.3			СН	CLAY with gravel: high plasticity, g red, gravel is sub-angular up to 4 r siltstone origin <i>(continued)</i> SILTSTONE: extremely weathered as CLAY: high plasticity, grey		D to	Н			6.00: INFERRED BEDROCK
				46.3	9			Continued on cored borehole shee						
<i>Meth</i> <i>Moth</i> <i>AD/T</i> - Aug <i>AD/V</i> - Aug <i>AD/V</i> - Aug <i>MB</i> - Was SPT - Star PT - Pus <i>AS</i> - Aug	er dril er dril hbore dard n tube er scr	e penetration test e		R	stance efusal		$>$ Inflo $\lhd$ Par	ater Samples an bw U - Undisturbed Sa tial Loss SPT - Standard Pen mplete Loss ES - Environmenta TW - Thin Walled LB - Large Disturb	ample nple etration Test I Sample		D M	re Cor - Dr - Mo - We	bist	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense

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Borehole ID

**BH04** 

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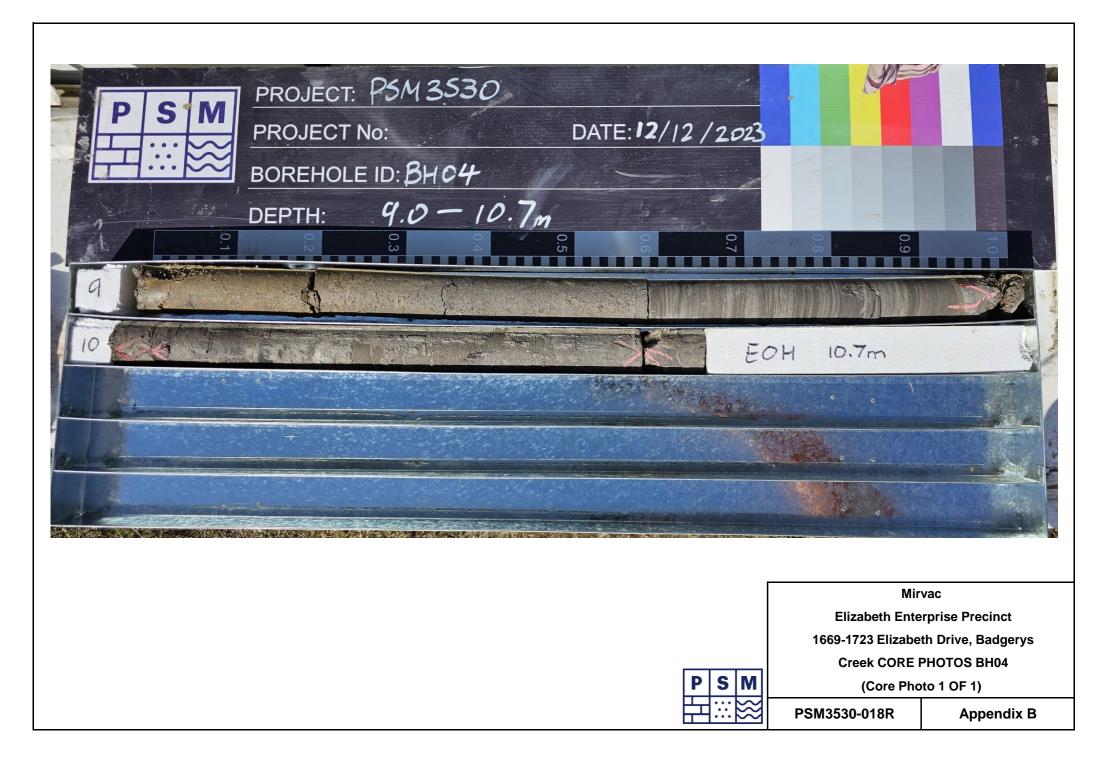
	ngi	nee	ring	Log	J - C	core	d B	orehole	Project No.:	PSM353	0	
	Clier				rvac			- Dra sig et	Commenced:	12/12/20		
	-		ame: ation:					e Precinct -018R Figure 1	Completed: Logged By:	12/12/20 JBL	23	
		Posi						0430.0 m N MGA2020 Zone 56	Checked By:	AS		
С	Drill	Mode	and M	ounti	ng:	Coma	acchi	o Geo 305 Inclination: -90°	RL Surface: 55	.30 m		
В	Barre	el Typ	be and L	engt	h:	3 m		Bearing:	Datum: AH	ID C	Opera	ator: Matrix Drilling
		Drill	ling Info	ormat	tion			Rock Substance			Ro	ock Mass Defects
			pu	WPT (Lugeons)			Ď	Material Description	Strength Is(50)			Defect Descriptions / Comme
2		(%)	Samples and Field Tests	(Luge			Graphic Log	ROCK NAME: particle/grain characteristics,	Weathering O - Axial		ng	Description, alpha/beta, infill
	Water	RQD (%)	amp ield	VPT	RL (m)	Depth (m)	braph	colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration		(mm)		or coating, shape, roughnes thickness, other
-	>	œ	ωп	>	(11)	(11)	0		X H M S H J J M H H	EH 500 500 500 500 500 500 500 50	9 ē	
						-	τ.				i i l	
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					49.3	6-						
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					48.3	7-						
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										i   i i i i	i i	
						-						
					7.3	8-					iil	
					47							
						-						
						-				i iiii	i i	
						-						
						-						
					e.			Continued from non-cored borehole sheet				
1					46.	- y-		SILTSTONE: grey and brown, highly weathered,				
						-		thinly laminated			01	
											01	
		97									01	
:			ls(50) d=0.27					Becomes moderately weathered			01	
			d=0.27 a=0.12 MPa			_						
												l-cz
		М	ethod				N	later Weathering	Defect Type	Infilling/		ing Roughness
			jer drilling T jer drilling V				> Inflo	The Highly Weathered	FT - Fault SS - Shear Surface	CN - C SN - S	tain	SL - Slickensided POL - Polished S Smooth
	WB	- Wa	shbore eline core (		m)			tial Loss MW - Moderately Weathered nplete Loss FR - Fresh	SZ - Shear Zone BP - Bedding parting SM - Seam	VN - V CO - C	oating	S - Smooth RF - Rough
	PQ	3-Win	eline core ( ndard pene	85.0 mi	m)			Strength	SM - Seam IS - Infilled Seam JT - Joint	RF - R G - G S - S	iravel	gments VR - Very Rough Shape
			h tube				Core	recovered (hatching L - Low Madium	CO - Contact CZ - Crushed Zone	Z - S CA - C	ilt	PR - Planar CU - Curved
	WP	T-Wa	ter pressure	e test			indic	ates material) M - Medium H - High	VN - Vein FZ - Fracture Zone	CL - C FE - In	lay on	UN - Undulating ST - Stepped
				1700-004	7 Cooto	chnical site		EH - Extremely High	BSH - Bedding Shear DB - Drilling Break	QZ - Q X - C	uartz	IR - Irregular

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BH04

Page 4 of 4

nenced: 12/12/2023 bleted: 12/12/2023 ed By: JBL ked By: AS				
urface: 55.30 m n: AHD Op	erator: Matrix Drilling			
	erator: Matrix Drilling Rock Mass Defects			
Strength Is(50) ● - Axial Defect O - Diametral Spacing (mm) S 任 J J E I F I V & & & & & & & & & & & & & & & & & &	Defect Descriptions / Commen Description, alpha/beta, infilling or coating, shape, roughness thickness, other			
	– BP, 5°, CN, PR, S – BP, 7°, CN, PR, S			
I         I	n SL - Slickensided POL - Polished ing RF - Rough fragments VR - Very Rough el R - Planar			
	Fault         CN - Clea           Shear Surface         SN - Stain           Shear Zone         VN - Ven           Bedding parting         CO - Coat           Seam         RF - Rock           Infiled Seam         G - Grav           Joint         S - Sanc           Contact         Z - Sitt			



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Borehole ID

**BH05** 

Pr Ho	ient: ojec ole L ole P	t Na .ocai	ion	Refer t	eth E o PS	M35	30-018	R Fig	gure 1	Comp Logge	nence leted: ed By: ked By		1 J	3/12 3/12 IBL AS		
	ill M ble D			d Mounting:		nacc 5 mm	hio Ge	o 30	5	Inclination: -90° RL So Bearing: Datur	urface: n:		53.10 AHD		0	perator: Matrix Drilling
			Drill	ling Informat	ion					Soil Description						Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary component additional observations	Moisture	Consistency /		Han netro UC (kPa	metei S a)	r Structure, Zoning, Origin Additional Observations
				SPT 0.50-0.95 m 1,4,4 N=8		52.1	- - - 1		СН	TOPSOIL: CLAY: high plasticity, brown grey mottled red, rootlets observed	, 					0.20: INFERRED NATURAL
		z		SPT 1.50-1.95 m 3,3,4 N=7		51.1	2				Dt	F				
				SPT 3.00-3.45 m 6,8,17 N=25		50.1				Becomes grey mottled red	M					
		z		SPT 4.50-4.95 m 11,15,20 N=35		49.1	4			Becomes grey mottled brown		VS				
AD AD SP AS CT	D/T - D/V - B - PT - - -	Pusr Auge	er dri er dri hbor dard tube er sci	l ling TC bit e penetration tes e ewing us push tube 1.	t	R	stance efusal		⊳ Infle ⊲ Par	ater Samples and Tests ow U - Undisturbed Sample tial Loss D - Disturbed Sample SPT - Standard Penetration ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Samp			D - M -	Cond Dry Mois Wet	t	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very losse L - Losse MD - Medium dense D - Dense VD - Very dense C - Cemented

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BH05

Client: Project N Hole Loc Hole Pos	ation	: Refer to	PSI	M353	30-018	R Fig	gure 1	A2020 Zone 56	Commen Complete Logged E Checked	ed: By:			2/202 2/202	
Drill Mod Hole Dia		0		naccl mm	nio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ce:	53. AH	10 m D		perator: Matrix Drilling
		ling Informatio						Soil Descri			,			Observations
Penetration			Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of p	Material Description		Condition Consistency / Consistency / Consis			er Structure, Zoning, Origin, Additional Observations			
				5	-		СН	CLAY: high plasticity, brown and (continued)			н	2	n 4 0	
2	2	SPT 6.00-6.12 m 17/120mm HB N=R		1 47.1	6			SILTSTONE: extremely to highly recovered as CLAY: high plastity	grey	D to M				6.00: INFERRED BEDROCK
				.1 46.1	-			Continued on cored borehole she						
				.1 45.1	-									
IIIII           IIIII           IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ger dr ger dr ashbo indaro sh tub ger so	penetration test		Re	tance efusal		⊳ Inflo ⊲ Par	ater Samples a bw U - Undisturbed tial Loss SPT - Standard Pe nplete Loss ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample enetration Test tal Sample		D M	e Cor - Dr - Mc - We	ist	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose

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Borehole ID

**BH05** 

Page 3 of 4

	gii	nee	ring	Log	J - C	ore	d B	orehole	Project No.:	PSM3530				
-	lien				rvac				Commenced:	13/12/2023				
	-		ame:					e Precinct	Completed:	13/12/2023				
		Loca Posi	tion:					-018R Figure 1 0630.0 m N MGA2020 Zone 56	Logged By: Checked By:	JBL AS				
			el and M be and L		-	Coma 3 m	cchi	o Geo 305 Inclination: -90° Bearing:		53.10 m AHD Operator: Matrix Drillin	a			
			ing Info	-		0		Rock Substance	Dulum. /	Rock Mass Defects				
			-						Strengt	h				
[] ː ː ː ː ː ː ː ː ː ː ː ː ː ː ː ː ː ː ː						Depth	aphic Log	Material Description ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, altera	Weathering O - Axia	al Defect Descriptions / C bral Spacing (mm) Description, alpha/bet or coating, shape, rou	Defect Descriptions / Commer Description, alpha/beta, infillir or coating, shape, roughness thickness, other			
						(m)	G		TIOLI X X X X X X X X X X X X X X X X X X X					
					47.1	6								
						7								
	7	80	Is(50) d=0.06 a=0.06 MPa		45.1			Continued from non-cored borehole sheet SILTSTONE: grey and brown, highly weathered, thinly laminated Becomes moderately weathered						
	75-100% Water RETURN		ls(50) d=0.11 a=0.15 MPa		44.1	- - 9					S, 5 mr			
		06	ls(50) d=0.09 a=0.15 MPa			-								
-		Me	ethod				W	ater Weathering	Defect Type	Infilling/Coating Roughr				
	AD/ WB HQ3 PQ3 SPT	V-Aug - Was 3- Win 3- Win 5- Star	er drilling T er drilling V shbore eline core ( eline core ( ndard pene h tube	/ bit 63.5 mr 85.0 mr	m)	<	∎ Con Ohic L	W         XW - Extremely Weather HW - Highly Weathered HW - Moderately Weathered MW - Moderately Weathered SW - Slightly Weathered SW - Slightly Weathered SW - Slightly Weathered FR - Fresh VL - Very Low recovered (hatching L - Low	ed FT - Fault SS - Shear Surface red SZ - Shear Zone BP - Bedding parting SM - Seam IS - Infilled Seam JT - Joint CO - Contact	CN - Clean         SL - Slicket           SN - Stain         POL - Polish           VN - Veneer         S - Smoot           CO - Coating         RF - Rough           RF - Rock fragments         VR - Very R           G - Gravel         Shape           S - Sand         Shape           Z - Sitt         PR - Plana	ed h tough <b>e</b>			
	WP	T-Wat	ter pressure	e test		$\ge$ 1	indica	ates material) M - Medium H - High	CZ - Crushed Zone VN - Vein FZ - Fracture Zone	CA - Calcite CU - Curve CL - Clay UN - Undul FE - Iron ST - Stepp	ating ed			
								ore recovery VH - Very High EH - Extremely High	BSH - Bedding Shear	QZ - Quartz IR - Irregul	ar			

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Borehole ID

BH05

Page 4 of 4

P H	lole	ect N	ame: ation: tion:	Eli Re	efer to	PSM	3530-	e Precinct -018R Figure 1 0630.0 m N MGA2020 Zone 56	Comment Complete Logged B Checked	d: 1 y: J	3/12/2023 3/12/2023 BL .S				
			el and M be and L		•	Coma 3 m	cchic	o Geo 305 Inclination: -90° Bearing:	RL Surfac Datum:	e: 53.10 AHD		rator: Matrix Drilling			
_			ling Info	-		• …		Rock Substance			Rock Mass Defects				
INIEILIOU	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration		Strength Is(50) ● - Axial ○ - Diametral	Defect Spacing (mm) <sup>ଝ</sup> ି ଓ ଝି ଓ <sup>00</sup>	Defect Descriptions / Commen Description, alpha/beta, infilling or coating, shape, roughness, thickness, other			
	75-100% Water RETURN	06	ls(50) d=0.32 a=0.3 MPa		 42.1	- - - 11-		SILTSTONE: grey and brown, highly weathered, thinly laminated <i>(continued)</i>							
					41.1	- - 12 -		Target depth							
					40.1	- 13 — -									
					39.1	- - 14 - -									
	AD/ WB HQ3 PQ3 SPT PT	T-Auς - Wa 3- Wir 3- Wir Γ- Sta - Pus	ethod ger drilling T ger drilling V shbore eline core ( eline core ( ndard pene sh tube ter pressure	/ bit 63.5 mr 85.0 mr tration f	n)	<	> Inflo ] Parti 【 Com [ Core Core	ater     Weathering       w     XW     Extremely Weathered       HW     Highly Weathered     HW       ial Loss     MW     Moderately Weathered       splete Loss     SW     Slightly Weathered       og/Core Loss     FR     Fresh       recovered (hatching     L     Low       ates material)     M     Medium	FT - Fault SS - Shea SZ - Shea BP - Bedd SM - Sean IS - Infille JT - Joint CO - Conta CZ - Crust VN - Vein	r Surface r Zone ing parting n ed Seam act	Infilling/Coa CN - Clean SN - Stain VN - Veneer CO - Coating RF - Rock fr G - Gravel S - Sand Z - Sitt CA - Calcite CL - Clay FE - Iron	SL - Slickensided POL - Polished S - Smooth RF - Rough			



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	<b>,</b>	ee	rin	ig Log - N	IO		brea	BO	reno	iie	Project N	No.:		Ρ5	M3530	)		
	ent:			Mirvac							Commer				12/202			
	oject										Complet				12/202	23		
	le Lo le P								-	A2020 Zone 56	Logged Checked			JBI AS				
				d Mounting:			hio Ge			Inclination: -90°	RL Surfa		51	.10 r				
	le D			-		5 mm		2 00	-	Bearing:	Datum:			HD Operator: Matrix Drillin				
			Dril	ling Informat	ion			Soil Description								Observations		
5	Penetration	Support	Water	Samples Tests Remarks			Depth (m)	Graphic Log Classification Symbol		Material Description SOIL NAME: Plasticity, beh particle characteristics of component, colour, secondary additional observatio	aviour or primary components,	iour or mary mponents, O		Consistency / Relative Density 800 (eAy) 800 (eAy) 800 (eAy) 800 (each) 800 (		Additional Observations		
		S	5		£	(m)	(11)		СН	TOPSOIL: CLAY: high plasticity,		≥0	OR	100	300 400 500			
				0.07	77		-		СН	grey CLAY: high plasticity, brown and	grey					0.20: INFERRED NATURAL		
				SPT 0.50-0.95 m 3,9,8 N=17			-						VSt					
						50.1	1											
		z		SPT 1.50-1.95 m			-											
				2,2,2 N=4		_	-											
						49.1	2-						F					
							-					D						
						<u>.</u>	3-											
				SPT 3.00-3.30 m 3,11 HB N=R		48	-											
							-											
						 47.1	-											
		z				47	-						Н					
				SPT			-											
				4.50-4.95 m 2,10,23 HB N=33			-											
WВ	T - / V - /	Was	er dri er dri hboi		N	netrat o resis			⊳ Infl ⊲ Par	tial Loss D - Disturbed S SPT - Standard Pe	Sample ample enetration Test		D M	re Co - D - M	ndition ry loist /et	VS - Very soft S - Soft F - Firm		
	F - S - F - /	Stan Pusł Auge	dard 1 tub er sc	penetration tes			efusal mm diai	neter		mplete Loss ES - Environmen TW - Thin Walled LB - Large Distu	tai Sample					St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense		
																D - Dense VD - Very dense		

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Ρ	lient: rojec ole L										Commen Complete Logged B	ed:			/12/	/202 /202			
	ole P								-	A2020 Zone 56	Checked	-		AS					
	rill M ole D			0		maccl i mm	hio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfac Datum:	ce:	51 AH	.10 i ID	m	0	perator: Matrix Drilling		
			Drill	ing Informati	on					Soil Descrip	tion					Observations			
	Penetration	Support Water		Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of pr component, colour, secondary co additional observations	iour or mary mponents,	Moisture Condition	Consistency / Relative Density	Pene	UCS (kPa	neter S )	- Structure, Zoning, Origir Additional Observations		
		z		SPT 6.00-6.40 m 2.27,7/100mm HB N=R		45.1	- - - 6		СН	CLAY: high plasticity, brown and g (continued) SILTSTONE: extremely weathered recovered as CLAY: high plasticity	ey	D	н		<u> </u>		6.00: INFERRED BEDROCK		
Í							-			Continued on cored borehole shee	t								
						44.1	7												
	и и и и и и и и и и и и и и	ethc	od er dril	ling TC bit	Pe		9		₩ ▷ Infl	iater Samples an Sw U - Undisturbed S		N	loistu				Consistency/Relative Den		
	В - РТ - Г - S -	was Stan Pusł Auge	hbore dard h tube er scr	penetration test		R			Par	W U - Undisturbed Sa tial Loss D - Disturbed Sa SPT - Standard Per ES - Environmenta TW - Thin Walled LB - Large Disturb	nple etration Test I Sample		M W	- C - N 7 - V	Vet	:	VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense		

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En	igi	nee	ering	Log	j - C	ore	d Bo	orehole	Project N	lo.: F	PSM3530	
	lien				rvac	–		5	Commer		3/12/2023	
		ect Na	ame: ation:				•	e Precinct 018R Figure 1	Complete Logged E		13/12/2023 IBL	
		Posi						016(Thgure 1 0847.0 m N MGA2020 Zone 56	Checked	•	AS	
C	) rill I	Mode	el and M	lounti	na:	Coma	acchic	Geo 305 Inclination: -90°	RL Surfa	-	0 m	
			be and L		•	3 m		Bearing:	Datum:	AHD		rator: Matrix Drilling
		Drill	ling Info	ormat	tion			Rock Substance			F	Rock Mass Defects
			р	ons)			5	Material Description		Strength Is(50)		Defect Descriptions / Commer
٦		(%)	Samples and Field Tests	WPT (Lugeons)			Graphic Log	ROCK NAME: particle/grain characteristics,	Weathering	● - Axial O - Diametral	Defect Spacing	Description, alpha/beta, infillin
Method	Water	RQD (%)	ampl ield 7	/PT (	RL	Depth	iraph	colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration		0.1 1 0.3 3 3	(mm)	or coating, shape, roughness thickness, other
2	5	£	SΨ	5	(m)	(m)	G		Ž Ž Ž Š Š Ľ	╡」≥ェチ듭	420 600 1000	
						-						
						-						
						-						
					45.1	6-						
								Continued from non-cored borehole sheet				
						-		SILTSTONE: grey and brown, highly weathered				
					44.1	7-						
						_						
						-	<u></u>	LAMINITE: 60% SANDSTONE, 40% SILTSTONE,				
			ls(50)			-		grey, fine grained, moderately weathered, thinly to thickly laminated				—BP, 0°, CN, PR, S
		0	d=0.34 a=0.45 MPa			-						
		70	WFa									
	URN				43.	8-						
	r RET					-						
NMLC	Wate					-						-CZ, RF, 70 mm
2	75-100% Water RETURN		ls(50)									C2, KF, 70 mm
	75-1		d=0.18 a=0.17 MPa									—BP, 0°, CL VN, PR, S
						-		Becomes 80% SILTSTONE, 20% SANDSTONE				
					42.1	9-						
						_						
			ls(50)									
		50	d=0.16 a=0.11			-						— BP, 5°, RF, PR, S, 15 mm
			MPa			-						
						-						– BP, 10°, CL VN, PR, S
												-BP, 5°, CL VN, PR, RF
	A.D.		ethod					ater Weathering XW - Extremely Weathered	Defe FT - Fau	ct Type	Infilling/Coa CN - Clean	sting Roughness SL - Slickensided
	AD/	V - Aug	jer drilling 1 jer drilling \ shbore	/ bit			> Inflov ⊲ Parti	W HW - Highly Weathered Al Loss MW - Moderately Weathered	SS - She SZ - She	ear Surface ear Zone	SN - Stain VN - Veneer	POL - Polished S - Smooth
	HQ	3- Wire	eline core ( eline core (					plete Loss SW - Slightly Weathered FR - Fresh	BP - Beo SM - Sea IS - Infil		CO - Coating RF - Rock fra G - Gravel	
	SPT	Γ- Stai	ndard pene h tube			Gra		bg/Core Loss Strength VL - Very Low L - Low	JT - Joir CO - Cor	nt ntact	S - Sand Z - Silt	Shape PR - Planar
			ter pressure	e test			indica	tes material) M - Medium H - High	VN - Vei	ished Zone n cture Zone	CA - Calcite CL - Clay FE - Iron	CU - Curved UN - Undulating ST - Stepped
			nco with AS	1726-201	17 Gente	chnical site		re recovery VH - Very High EH - Extremely High		ding Shear	QZ - Quartz X - Carbon	IR - Irregular

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Borehole ID

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Fr	nai	nee	rina		1 - C	ore	d Bo	orehole		Pro	ject N	lo.:		PSM	L 3530	)	Γc	ge 4 of 4	
( F H	Clien Proje Hole	it: ect Na	ame: ition:	Mi Eli Re	rvac izabel efer to	th Ent	erpris 3530-	e Precinct 018R Figure 1 0847.0 m N MGA2020 Z	Zone 56	Cor Cor Log	nmer nplet ged l	iced: ed: By:		13/12 13/12 JBL AS	2/202	23			
			l and M e and L		-		acchio		clination: -90°	RL Dat	Surfa	ce:	51.1 AHI	10 m	0	)nor	ator: N	latrix Drillir	a
-	Sane		ing Info	-		3 m			earing: Rock Substance	Dat	um.		Апі	, 		•		latrix Drillir s Defects	ig
			-	1									ngth			~		5 Dereets	
Method	Water RQD (%) Samples and Field Tests (m) (m) (m) (m) (m)					Depth (m)	Graphic Log	Material De ROCK NAME: particle/, colour, fabric/texture, components, moisture, mine	/grain characteristics, , inclusions or minor		Weathering ≳ ≩ ≩ ゑ ⊮		50) Axial ametral ᠸ ॢ Ҿ :: म ऄ ਹੋ	Sp (	efect bacin mm) ରୁଷ୍ଡି	g	Descript or coati	escriptions / ( ion, alpha/be ng, shape, ro nickness, oth	ta, infilling ughness,
NMLC		50	Is(50) d=0.13 a=0.37 MPa			-		LAMINITE: 60% SANDSTO grey, fine grained, moderate thickly laminated <i>(continued)</i> Becomes slightly weathered	ely weathered, thinly to )										
					40.1	- 11		Hole Terminated at 10.70 m Target depth	n										
					39.1	- - 12 -													
					38.1	- - 13- -													
			ethod er drilling T er drilling V shore eline core (i dine core (i dard pene h tube ter pressure nce with AS 1		37.1	- - 14 — -													
	AD/ AD/ WB HQ3 PQ3	<b>M</b> T - Aug V - Aug - Wa 3- Wir 3- Wir	ethod er drilling T er drilling V shbore eline core (i	C bit / bit 63.5 mi	m)		Wa > Inflov ☐ Parti ■ Com	a <b>ter</b> v al Loss plete Loss	Weathering           XW         Extremely Weathered           HW         Highly Weathered           MW         Moderately Weathered           SW         Silghtly Weathered           FR         Fresh	S S B S	T - Fai S - Shi Z - Shi P - Bei M - Sei	ear Surface ear Zone Iding part	ce ling	CI SN VI CC RI	                                   	ean ain eneer oating ock fra	t <b>ing</b> gments	Roughi SL - Slicke POL - Polish S - Smoo RF - Rougl VR - Very f	nsided ed th า
Log	SPI PT WP	F-Star -Pus T-Wa	ndard pene h tube er pressure	tration e test	test 17 Geoteo	Gra	Dhic Lo Core i indica No co e investig	<b>bg/Core Loss</b> recovered (hatching tes material) re recovery ations	Strength VL - Very Low L - Low M - Medium H - High VH - Very High EH - Extremely High	J C C V F B	T - Joi O - Co Z - Cru N - Vei Z - Fra SH - Bei	nt ntact shed Zor	ie ie :ar	S Z C/ CL FE Q2	- Gi - Sa - Sil - Ca - Cli - Iro 2 - Qu - Ca	and It alcite ay on Jartz	ceous	Shap PR - Plana CU - Curve UN - Undu ST - Stepp IR - Irregu	r :d lating ied



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Borehole ID

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Pro Ho	le L	t Na .oca	me: tion: ion:	Refer to	o PS	M35	30-018	R Fię	gure 1	A2020 Zone 56	Commenced Completed: Logged By: Checked By		14/12 14/12 JBL AS		
Dri	II M	ode	lan	d Mounting:	Cor	nacc	hio Ge			Inclination: -90°	RL Surface:	4	3.10 m		
Ho	le D		eter			5 mm				Bearing:	Datum:	A	HD	0	perator: Matrix Drilling
			Driii	ling Informati	ion					Soil Descrip	tion				Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of prin component, colour, secondary con additional observations	nary ກponents, ເຊ	Consistency / Relative Density	Har Penetrc UC (kP	ometer S a)	Structure, Zoning, Origin Additional Observations
							-		СН	TOPSOIL: CLAY: high plasticity, brootlets observed CLAY: high plasticity, brown and gr	/-				0.15: INFERRED NATURAL
				SPT 0.50-0.95 m 3,5,7 N=12		 47.1	- 1					St			
		z		SPT 1.50-1.95 m 5,10,11 N=21		 46.1				Becomes grey mottled red Ironstone band encountered					
				SPT 3.00-3.45 m 7,9,15 HB N=24		 45.1	3-				D tr M				
		z		SPT 4.50-4.65 m 18 HB N=R		44.1	4			SILTSTONE: extremely weathered recovered as CLAY: high plasticity,					4.50: INFERRED BEDROCK
NF	/T - /V - 3 - T - -	Was Stan Pusł Auge	er dri er dri hbor dard n tub er sc	lling TC bit lling V bit e penetration tesi		R	stance efusal		⊳ Infl ⊲ Par	fater Samples and ow U - Undisturbed Sa tial Loss D - Disturbed Sa SPT - Standard Pene mplete Loss ES - Environmenta TW - Thin Walled LB - Large Disturbe	ample nple etration Test Sample	E N	ure Conc ) - Dry A - Mois V - Wet	st	Consistency/Relative Den VS - Very soft S - Soft F - Firm VSt - Very stiff H - Hard VL - Very losse L - Loose MD - Medium dense D - Dense

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lient:			Mirvac							Commence	ed:	14/12/2	
rojec										Completed		14/12/20	023
lole L Iole F							-		A2020 Zone 56	Logged By Checked B		JBL AS	
						hio Ge			Inclination: -90°	RL Surface	-	48.10 m	
lole D			-		5 mm			_	Bearing:	Datum:			Operator: Matrix Drilling
		Drill	ing Informati	on					Soil Descrip	tion			Observations
Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of pri component, colour, secondary co additional observations	iour or mary mponents,	Condition	Consistency / Relative Density 200 / 100 200 / 2	ter Structure, Zoning, Origir Additional Observations
	z	>	SPT 6.00-6.15 m 18 HB N=R		42.1	(iii)   6  			SILTSTONE: extremely weathered recovered as CLAY: high plasticity (continued)	<sup>'</sup> dark grey	) to M	400 C	
					40.1 41.1	7			Continued on cored borehole shee	t			
					39.1	9							
D/T - D/V - /B - PT - T - S -	Auge Was Stan Pusł Auge	er dril er dril hbore dard tube er scr	penetration test		R	stance efusal		⊳ Inflo ⊲ Par	ater Samples an w U - Undisturbed S tial Loss D - Disturbed Sar SPT - Standard Pen nplete Loss ES - Environmenta TW - Thin Walled LB - Large Disturb	Sample nple etration Test I Sample	М	oisture Conditio D - Dry M - Moist W - Wet	Dr Consistency/Relative Den: VS - Very soft S - Soft F - Firm VSt - Very stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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Borehole ID

BH07

Page 3 of 4

Ingi	nee	ring	Log	- C	ore	d Bo	orehole		Project	No.: F	► SM3530	Page 3 of 4
Clier Proje Hole Hole	ect Na Loca	ation:	Eli Re	efer to	PSM	3530-	e Precinct 018R Figure 1 )996.0 m N MGA2020 2	Zone 56	Comme Comple Logged Checke	ted: ·	14/12/2023 14/12/2023 JBL AS	
		el and M be and L		0	Coma 3 m	acchio		clination: -90° earing:	RL Surfa Datum:	ace: 48.1 AHD		rator: Matrix Drilling
Dant		ling Info			0 111			Rock Substance	Datum			Rock Mass Defects
Wethod Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	ROCK NAME: particle	, inclusions or minor	Weathering	O - Diametral	Defect Spacing (mm) ଝି <sub>ଡ</sub> ଝି ଛି <sup>ତି</sup>	Defect Descriptions / Commen Description, alpha/beta, infillin or coating, shape, roughness thickness, other
				42.1	- - - 6							
		Is(50) d=2.87 a=3.62 MPa		41.1	- 7		Continued from non-cored SILTSTONE: grey and bro thinly laminated Becomes moderately wea	wn, highly weathered,				
75-100% Water RETURN	63	ls(50) d=0.48 a=0.98		40.1	- 8 - -		LAMINITE: 70% SANDST pale yellow and grey, fine t moderately weathered, thi	to medium grained,				- BP, 5°, CL VN, PR, S - BP, 5°, CL CO, PR, RF - BP, 10°, CL CO, PR, S - BP, 10°, CL VN, UN, RF
75	87	MPa Is(50) d=0.19 a=0.38 MPa		39.1	- 9 - - -		Becomes 80% SILTSTON and slightly weathered	E, 20% SANDSTONE				- SM, CL, 20 mm - BP, 5°, CL CO, PR, RF - BP, 5°, CL VN, PR, RF - BP, 5°, CL VN, PR, S
AD/ WB HQ PQ SP PT WP	/T - Aug /V - Aug 3 - Was 3- Wire 3- Wire 3- Wire 7- Star - Pus PT - Wat	eline core (6 eline core (8 ndard pene	/ bit 63.5 mr 85.0 mr tration f e test	n) æst	Graj	<ul> <li>&gt; Inflov</li> <li>☐ Parti</li> <li>■ Com</li> <li>■ Core</li> <li>■ Core</li> <li>■ Core</li> <li>■ No co</li> </ul>	al Loss plete Loss <b>og/Core Loss</b> recovered (hatching tes material) re recovery	Weathering           XW         Extremely Weathered           HW         Highly Weathered           MW         Moderately Weathered           SW         Slightly Weathered           FR         Fresh           Strength         VL           VL         Very Low           L         Low           M         Medium           H         High           VH         Very High           EH         Extremely High	FT - Fa SS - Si SZ - Si BP - Ba SM - Sa IS - In JT - Ja CO - C CZ - C VN - Ka FZ - Fa BSH - Ba	hear Surface hear Zone edding parting aam filled Seam oint ontact rushed Zone	CN - Clean SN - Stain VN - Veneet CO - Coatin, RF - Rock fr G - Gravel S - Sand Z - Silt CA - Calcite CL - Clay FE - Iron QZ - Quartz X - Carbor	SL - Slickensided POL - Polished S - Smooth agments VR - Rough VR - Very Rough <b>Shape</b> PR - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular

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Borehole ID

BH07

Page 4 of 4

Eng	gir	nee	ring	Log	j - C	ore	d Bo	orehole	Project N	No.: F	PSM3530	Page 4 of 4
Ho	ojec ole L	ct Na	ame: tion: tion:	Eli Re	efer to	PSM	3530-	e Precinct 018R Figure 1 )996.0 m N MGA2020 Zone 56	Commer Complete Logged I Checked	ed: 1 By: J	14/12/2023 14/12/2023 JBL AS	
Dri	ill N	/lode	l and M	ounti	ng:	Coma		Geo 305 Inclination: -90°	RL Surfa	ice: 48.10	0 m	
Ba			e and L	-		3 m		Bearing:	Datum:	AHD		rator: Matrix Drilling
	, 	Drill	ing Info		ion	1		Rock Substance		Strength	F	Rock Mass Defects
Method	water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteratio	Weathering N ≳ £ ≩ § ∰	ls(50)	Defect Spacing (mm)	Defect Descriptions / Commen Description, alpha/beta, infillin or coating, shape, roughness thickness, other
INIVILO		87	ls(50) d=0.47 a=0.62 MPa			-		LAMINITE: 70% SANDSTONE, 30% SILTSTONE, pale yellow and grey, fine to medium grained, moderately weathered, thinly laminated( <i>continued</i> )				
					37.1	- - 11		Hole Terminated at 10.50 m Target depth				
					36.1	- - 12 -						
					1 35.1	- - 13- -						
					34.1	- - 14 -						
A V	AD/V WB -	- Aug / - Aug - Was	ethod er drilling T er drilling V shbore elline core (; idiard pene h tube er pressure er pressure nce with AS 1	bit	m) m) test	<	> Inflov ⊲ Partia	al Loss MW - Moderately Weathered	FT - Fau SS - Shich BP - Bec SM - See IS - Infii JT - Join CO - Con CZ - Cru VN - Vei	ear Surface ear Zone dding parting am lled Seam nt nt ntact ushed Zone	Infilling/Coa CN - Clean SN - Stainer CO - Coating RF - Rock fr G - Gravel S - Said CA - Catclite CL - Clay FE - Iron	SL - Slickensided POL - Polished S - Smooth agments VR - Very Rough Shape PR - Planar



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Borehole ID

**BH08** 

Client: Project Name Hole Location Hole Position:	Refer to PSM3530-018	recinct 3R Figure 1	Commenced: 14/12/202 Completed: 14/12/202 Logged By: JBL Checked By: AS	
Drill Model an Hole Diamete	-		RL Surface: 40.80 m Datum: AHD C	perator: Matrix Drilling
Dril	ling Information	Soil Descripti	on	Observations
Penetration Support Water	Samples Tests Remarks	Borner     Material Description       Distribution     SOIL NAME: Plasticity, behavio particle characteristics of prime component, colour, secondary com additional observations	arv [≒≓[ʊ≯] UCS	r Structure, Zoning, Origin Additional Observations
Not Encountered	SPT 0.50-0.95 m 6,10,12 N=22 CBR 0.50-1.00 m SPT 1.50-1.95 m 4,10,10 N=20 ES 1.50 m SPT 3.00-3.45 m 3,8,15 N=23 	CH TOPSOIL: CLAY: high plasticity, brown rootlets observed CH CLAY: high plasticity, brown mottled in Becomes brown grey		0.20: INFERRED NATURAL
Method AD/T - Auger dr AD/V - Auger dr WB - Washbo	SPT 4.50-4.73 m 11,13/80mm HB N=R	SILTSTONE: extremely weathered, r         as CLAY: high plasticity, dark grey         Water       Samples and T         □       Inflow       U         □       Partial Loss       D         □       Partial Loss       SPT- Standard Penett         ■       Complete Loss       ENvironmental S         TW       Thin Walled	Tests Moisture Condition mple D - Dry le M - Moist ration Test W - Wet	4.50: INFERRED BEDROCK 4.50: INFERRED BEDROCK VS - Very soft S - Soft F - Firm St - Stiff VS - Very stiff VS - Very stiff

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BH08

P F	Client: Project Iole L	oca	tion:	Mirvac Elizabe Refer to	PS	M353	30-018	R Fig	gure 1		Commer Complet Logged I	ed: By:		14 JE			
							250973 hio Ge			A2020 Zone 56 Inclination: -90°	Checkeo RL Surfa	-	10	AS .80			
	lole D			-		i mm		0.30	J	Bearing:	Datum:	ace.	40 AH			С	Operator: Matrix Drilling
		1	Drilli	ng Informati	on					iption						Observations	
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of p component, colour, secondary o additional observation	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hane etror UCS (kPa	nete S	Additional Observation
		Z	Not Encountered			8	-			SILTSTONE: extremely weathere as CLAY: high plasticity, dark gre		D					
							- - - 7 -			Hole Terminated at 6.00 m Target depth							
						1 32.8	- - 8 -										
						31.8	9										
V S P A	.D/T - 7 .D/V - 7 VB - 1 PT - 1 PT - 1 .S - 7	Was Stan Pusł Auge	er drilli er drilli hbore dard p dard p tube er scre	penetration test	N	R	stance efusal		⊳ Infl ⊲ Par	ater Samples a ow U - Undisturbed tial Loss D - Disturbed S SPT - Standard Pe nplete Loss ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample enetration Test tal Sample		loistui D M W	- [ - ]	ondi Dry Woist Wet	<b>ition</b>	<ul> <li>Consistency/Relative Detension</li> <li>VS - Very soft</li> <li>S - Soft</li> <li>F - Firm</li> <li>St - Stiff</li> <li>VSt - Very stiff</li> <li>H - Hard</li> <li>VL - Very loose</li> <li>L - Loose</li> <li>MD - Medium dense</li> <li>D - Dense</li> <li>VD - Very dense</li> <li>C - Cemented</li> <li>C - Cemented</li> </ul>

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Borehole ID

BH09

Client:     Mirvac       Project Name:     Elizabeth Enterprise Precinct       Hole Location:     Refer to PSM3530-018R Figure 1       Hole Position:     293277.0 m E 6250822.0 m N MGA2020 Zone 56       Drill Model and Mounting:     Comacchio Geo 305     Inclination: -90°											Comme Complet Logged Checked	ed: By:			2/202 2/202	
			ano eter	d Mounting:		nacc 5 mm		eo 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	40 Ał	.90 m <del>I</del> D		perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Descri	otion					Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary c additional observation	rimary omponents,	Moisture Condition	Consistency / Relative Density	Penetr U (kl	and ometer CS Pa)	r Structure, Zoning, Origin Additional Observations
		z		SPT 0.50-0.95 m 9,14,23 HB N=37		39.9	- - - 1		СН	TOPSOIL: CLAY: high plasticity, t rootlets observed CLAY: high plasticity, brown mottl			н			0.15: INFERRED FILL
			Not Encountered	SPT 1.50-1.95 m 10,11,14 N=25		38.9	2		СН	CLAY: high plasticity, brown grey		D	VSt			2.50: INFERRED NATURAL
		Z	Z	SPT 3.00-3.45 m 4,5,6 N=11		37.9	3									
			<u>.</u>	SPT 4.50-4.95 m 4.5.6 N=11		36.9	4		14		ad Tasta	м	St		dition	Consistence://Polotive Dee
۹D/۱	T - / V - / - \ - \ - /	Auge Was Stan Push Auge	er dril er dril hbore dard tube er scr	penetration tes		R	stance efusal		> Infl ⊲ Par	fater         Samples au           ow         U         - Undisturbed           tial Loss         D         - Disturbed Sa           SPT - Standard Pe         ES         - Environmeni           TW         Thin Walled         LB         - Large Disturbed	Sample Imple netration Tes al Sample		D M	re Con - Dry - Mo / - We	/ ist	Consistency/Relative Dens VS - Very soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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BH09

Engineering Log - Non	Cored Borend	le F	Project No.:	PSM3530	
Hole Location: Refer to PSI	nterprise Precinct M3530-018R Figure 1 E 6250822.0 m N MG	C L	Completed: .ogged By:	14/12/2023 14/12/2023 JBL AS	
Drill Model and Mounting: Con Hole Diameter: 125	RL Surface: 40.9 Datum: AHD		Matrix Drilling		
Drilling Information		Soil Descriptio			Observations
Method Penetration Lests Kecovery Recovery	(m)	Material Description SOIL NAME: Plasticity, behaviou particle characteristics of prima component, colour, secondary comp additional observations	ry onents,		ucture, Zoning, Origin, ditional Observations
UDV UDV UDV UDV UDV UDV UDV UDV	-6.45 6	CLAY: high plasticity, brown grey <i>(con</i>			RRED BEDROCK
N=R         N		Hole Terminated at 6.24 m Target depth			
Method Per AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB - Washbore SPT - Standard penetration test PT - Push tube AS - Auger screwing CT - Continuous push tube 1.5m lor	o resistance	Samples and T           ater         Samples and T           bw         U         Undisturbed Sam           tial Loss         D         Disturbed Samples           SPT         Standard Penetra           nplete Loss         ES         Environmental Sa           TW         Thin Walled         LB           LB         Large Disturbed Samples         Samples	aple D - e M - ation Test W - ample	- Dry. V - Moist S - Wet F - Wet S V H U L	St - Very stiff - Hard - Very loose - Loose D - Medium dense - Dense D - Very dense e - Cermented

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Borehole ID

BH10

Clier Proje Hole Hole	ect Lc	ocat	ion:	Refer to	o PS	M35	30-018	BR Fig	jure 1	Comme Complet Logged A2020 Zone 56 Checked	ed: By:			2/202 2/202	
	rill Model and Mounting: Comacchio ( ole Diameter: 125 mm													0	perator: Matrix Drilling
				ing Informati		,				Bearing: Datum: Soil Description				0	Observations
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Ha Penetro UC (kF	nd ometer SS Pa)	Structure, Zoning, Origir Additional Observations
		0,	2	SPT		()	-		CI	CLAY: medium plasticity, pale brown	D	F to St	200	20	0.00: INFERRED FILL
		z		0.50-0.95 m 9,9,12 N=21		40.7	- 1		СІ-СН	Gravelly CLAY: medium to high plasticity, brown and dark grey, gravel is sub-angular to sub-rounded up to 5 mm	D to M				
			ountered	SPT 1.50-1.95 m 8,8,16 N=24 ES 1.50 m		 39.7	- 2—		CI	Gravelly CLAY: medium plasticity, dark grey and grey, gravel is angular to sub-angular up to 30 mm, SHALE origin		VSt			
		z	Not Encountered	SPT 3.00-3.45 m 6,20,11 N=31		 38.7				and gréy, gravel is sub-rounded up to 20 mm	D				
						37.7	4	~~~	СН	CLAY: high plasticity, brown mottled red, ironstained	м	-			3.50: INFERRED NATURAL
D/T	                                 	etho Auge	<b>d</b> r dril	SPT 4.50-4.95 m 3.4.5 N=9 ling TC bit ling V bit	_	netrat			₩ > Infl	Becomes pale grey mottled brown ater Samples and Tests ow U - Undisturbed Sample	<u></u> л	D	re Cont - Dry		Consistency/Relative Den
VB SPT PT AS	- V - S - P - A	Vasi Stano Push Auge	hbore dard tube r scr	e penetration test		R				D - Disturbed Sample SPT - Standard Penetration Tes SPT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample	t	W	- Mói - We	sı t	VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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Client:

Penetration

Method

AD/T

2019-03-06 Pri: PSM 3.02.0 2019-02-24

Tool | Lib: PSM 3.02.1

nd Map

0.03.00.09 Datgel

09:59 07/02/2024

PSM3530.GPJ

RH N7 AU

ALLNONCORF

PSM.

LIB.GLB Log

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PSM

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Borehole ID

**BH10** Page 2 of 2

Loose Medium dense Dense Very dense Cemented Compact

L MD D VD

Ce C

**Engineering Log - Non Cored Borehole** PSM3530 Project No.: Mirvac Commenced: 18/12/2023 Project Name: Elizabeth Enterprise Precinct Completed: 18/12/2023 Hole Location: Refer to PSM3530-018R Figure 1 Logged By: KQ Hole Position: 293367.0 m E 6250708.0 m N MGA2020 Zone 56 Checked By: AS Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 41.70 m Hole Diameter: 125 mm Bearing: Datum: AHD Matrix Drilling Operator: **Drilling Information** Soil Description Observations Consistency / Relative Density Material Description Classification Symbol g Hand Samples SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations Structure, Zoning, Origin, Additional Observations Moisture Condition Penetrometer Recovery Graphic L Tests Support UCS Water Remarks (kPa) RL Depth (m) (m) 100 200 300 500 CLAY: high plasticity, brown mottled red, ironstained (continued) СН Encountered St Μ z Not 6 35. 6.00: Water observed in SPT sample SPT Ironstone gravels observed 6.00-6.45 m M to 5,8,11 N=19 VSt W Hole Terminated at 6.45 m Target depth 34.7 7 33.7 8 32.7 9 
 Method
 Penetration

 AD/T - Auger drilling TC bit
 Ab/T - Auger drilling V bit

 AD/V - Auger drilling V bit
 No resistance

 WB - Washbore
 ST - Standard penetration test

 SPT - Standard penetration test
 Refusal

 AS - Auger screwing
 Refusal

 CT - Continuous push tube 1.5m long 76mm diameter

 Consistency/Relative Density

 VS
 - Very soft

 S
 - Soft

 F
 - Firm

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose
 Samples and Tests Moisture Condition Water Samples and rests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample D M W - Dry - Moist - Wet  $\triangleright$ Inflow Partial Loss Complete Loss

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BH11

Clie	ent:			Mirvac						Comme	nced:		18/12/202	23
Proj	ject	Na	me:							Comple			18/12/202	
Hole Hole										re 1 Logged By: I MGA2020 Zone 56 Checked By			KQ AS	
				d Mounting:			hio Ge			Inclination: -90° RL Surfa	-	11	.10 m	
Hole				-		5 mm		:0 300	,	Bearing: Datum:	100.			perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Description				Observations
Γ									<i>c</i>	Material Description	Τ	/ isity		
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetromete UCS (kPa)	r Structure, Zoning, Origin Additional Observations
		z		SPT 0.50-0.95 m					CI	CLAY with gravel: medium plasticity, grey, gravel is sub-rounded to rounded up to 10 mm		St		0.00: INFERRED FILL
				9,9,11 N=20		40.1	1			Clayey GRAVEL: dark grey and grey, sub-angular to sub-rounded up to 20 mm, siltstone origin, clay is medium plasticity, pale grey	D	MD		
				SPT 1.50-1.95 m 23,22,11 N=33		39.1	2-		CI	CLAY with gravel: medium plasticity, grey mottled brown, gravel is sub-angular up to 10 mm of siltstone origin			-	
		N		SPT 3.00-3.45 m 5,7,9		38.1	3-		СН	CLAY: high plasticity, brown and red mottled dark brown, ironstained	D to M	VSt		3.00: INFERRED NATURAL
				N=16		37.1					М			
				SPT 4.50-4.95 m 3,3,8 N=11			-			Ironstone gravels observed				
WB	T - A √ - A - \ - S - F	Nasi Stan Push	r dril r dril nbore dard tube	penetration test			stance		> Inflo ⊲ Par	Samples and Tests           ow         U         - Undisturbed Sample           tial Loss         D         - Disturbed Sample           splete Loss         SPT         Standard Penetration Test           mplete Loss         ES         - Environmental Sample           TW         Thin Walled         LB         - Large Disturbed Sample	Λ. t	D M	re Condition - Dry I - Moist / - Wet	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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Borehole ID

BH11

P H	Client: Trojec Iole L Iole F	t Na .oca	tion:	Refer to	o PS	M35	30-018	R Fi	gure 1	A2020 Zone 56	Comme Complet Logged Checked	ed: By:					
	rill M Iole E			d Mounting:		nacc i mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:		.10 HD	m	0	perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Descr	iption						Observations
50.50	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of f component, colour, secondary o additional observatio	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hand etron UCS (kPa	nete S	r Structure, Zoning, Origin Additional Observations
		z				-	-		СН	CLAY: high plasticity, brown and dark brown, ironstained <i>(continue</i>		м	St				
				SPT 6.00-6.45 m 9,19,22 N=41		35.1	6					w	н				
						 34.1	7			Target depth							
						33.1	- 8										
						32.1	9										
A N S P A	D/T - D/V - /B - PT - T - S -	Auge Was Stan Pusł Auge	er dril er dril hbore dard tube er scr	penetration test		R	stance efusal		⊳ Infl ⊲ Par	ater Samples a ow U - Undisturbec tial Loss D - Disturbed P mplete Loss SPT - Standard P ES - Environmer TW - Thin Walled LB - Large Distu	l Sample ample enetration Tes tal Sample		M	ire C - [   -   / - \	Dry Moist		Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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BH12

P H	lient: rojec ole L	t Na .oca	ion:	Refer to	PS	M353	30-018	BR Fig	jure 1	C	Commen Complete ogged E	ed: By:		18/ KQ	12/20 12/20	
	ole F						hio Ge				hecked	,	43	AS .10 m	<u></u> ו	
	ole D					i mm					atum:		AH			Operator: Matrix Drilling
		1	Drill	ing Informatio	on					Soil Description	n					Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour particle characteristics of primar component, colour, secondary compo additional observations	r or Ƴ onents,	Moisture Condition	Consistency / Relative Density	Penet U (k	and romet ICS Pa)	Additional Observations
		z		SPT					CI	CLAY trace gravel: medium plasticity, grey mottled yellow brown, gravel is up mm of siltstone origin		D	St			0.00: INFERRED FILL
				0.50-0.81 m 12,23,3/10mm HB N=R		 42.1	1		GC	Gravelly CLAY: medium plasticity, dark and grey, gravel is angular up to 30 m siltstone origin						
				SPT 1.50-1.90 m 13,16,20/100mr HB N=R		41.1	2-			Ironstone gravel observed, rounded ar 30 mm	nd up to	D	Н			
		z	Not Encountered	SPT 3.00-3.45 m 7.14.16 N=30		40.1	3-		GC	GRAVEL with clay: pale to dark grey, sub-angular to sub-rounded up to 40 n siltstone and sandstone origin, clay is n plasticity	nm, of medium	м	D			
				SPT 4.50-4.95 m 5,6,10 N=16		39.1	4		СН	CLAY: high plasticity, brown and red m dark grey, ironstained	nottled	M	St to VSt			4.20: INFERRED NATURAL
A[ W	D/T - D/V - /B - PT - T - S -	Auge Was Stan Push Auge	er dril er dril hbore dard tube er scr	penetration test		R	stance efusal		> Inflo ⊲ Par	ater Samples and Te bw U - Undisturbed Sam D - Disturbed Sample SPT - Standard Penetra mplete Loss ES - Environmental Sa TW - Thin Walled LB - Large Disturbed S	ple ition Test ample		D M	re Col - Dr - Ma - W	oist	Drn Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very slose L - Loose MD - Medium dense D - Dense

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Borehole ID

BH12

Clier Proje		Na	me:	Mirvac Elizabe	eth E	nterp	rise Pr	ecinc	t		Commence Completed:	d:	18/12/20 18/12/20			
Hole Hole								-		A2020 Zone 56	Logged By: Checked By	-	KQ AS			
				I Mounting:			hio Ge			Inclination: -90°	RL Surface:		A.5 3.10 m			
Hole				-		5 mm		0 000		Bearing:	Datum:			Operator: Matrix I	Drilling	
		L	Drill	ing Informat	ion					Soil Descript	ion			Observations		
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavio particle characteristics of prim component, colour, secondary com additional observations	nary 🗄	Condition Consistency / Relative Density	Hand Penetrome UCS (kPa)	er Structure, Zc Additional C	Structure, Zoning, Origin, Additional Observations	
									СН	CLAY: high plasticity, brown and red dark grey, ironstained (continued)	mottled					
							-				N	St to VSt				
		z	Not Encountered	SPT 6.00-6.45 m 2,2,3 N=5		37.1	6			Becomes pale grey mottled brown						
			2			 36.1	- 7— -				M I M					
				SPT 7.50-7.95 m 5,4,8 N=12		35.1	-			Sandy CLAY: high plasticity, dark ye is medium to coarse grained	 llow, sand	St	-			
							-			Hole Terminated at 8.00 m Target depth						
						 34.1	9									
AD/T AD/V WB SPT PT AS	<i>Me</i> - A - A - A - A - A - A - A - A - A	Vasł Stanc Push Nuge	r dril r dril hbore dard tube r scr	penetration tes	t	R	stance efusal		> Infl ⊲ Par	ater Samples and ow U - Undisturbed Sa tial Loss D - Disturbed Sam spT- Standard Pene mplete Loss ES - Environmental TW - Thin Walled LB - Large Disturbed	imple ple tration Test Sample	D M	re Conditio - Dry I - Moist / - Wet	n Consistency/RR VS - Very S - Soft F - Firm St - Stiff VSt - Very H - Hard VL - Very L - Loos MD - Medi	stiff loose	

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BH13

P H	lient: rojec ole L ole P	t Na ocai	ion:	Refer to	eth E o PS	M353	30-018	BR Fig	ure 1	A2020 Zone 56	Commer Complete Logged E Checked	ed: 3y:		18/12 18/12 KQ AS			
	rill M ole D			d Mounting:		nacc i mm	hio Ge	eo 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ce:	40. AH	80 m D	0	perator: Matrix Drilling	
			Drill	ing Informat	ion					Soil Descr	iption					Observations	
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of p component, colour, secondary o additional observation		Moisture Condition	onsist elative	Ha Penetro UC (kF	ometei SS Pa)	r Structure, Zoning, Origin, Additional Observations	
AUV		z		SPT 0.50-0.95 m 10,6,7 N=13 ES 0.50 m			-		СІ	CLAY with gravel: medium plasti and yellow, gravel is sub-rounder mm CLAY: high plasticity, pale grey n iron stained	d úp to 20	D to M	St			0.00: INFERRED FILL 0.70: INFERRED NATURAL	
				SPT 1.50-1.95 m 3,9,14 N=23 ES 1.50 m		 38.8 39.8	1 - - 2					М				1.50: Ironstone gravels observed with SPT sample	
		z		SPT 3.00-3.19 m -7,22/40mm HB N=R	3	37.8				SILTSTONE: extremely weather as CLAY: high plasticity, grey Hole Terminated at 3.20 m	ed, recovered					3.00: INFERRED BEDROCK	
				<u>IV=R</u>						Refusal							
	                               	Was Stan Push Auge	er dril er dril hbore dard tube er scr	ling TC bit ling V bit e penetration test e ewing us push tube 1.3		R	stance efusal	•	> Inflo ⊲ Par	ater Samples a bw U - Undisturbed tial Loss D - Disturbed S SPT - Standard Pe nplete Loss ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample enetration Test tal Sample		loisture D M W	e Cond - Dry - Moi - We	st	Consistency/Relative Densistency/Relative Densistency S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense	

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Borehole ID

BH14

Clien Proje Hole Hole	ect N Loc	atic	n: Refer	eth E to PS	SM35	30-018	BR Fig	jure 1	Com Logg	mence bleted: ed By: ked By		18/12/202 18/12/202 KQ AS			
Drill I Hole			nd Mounting: er:		macc 5 mm	hio Ge	eo 305	5	Inclination: -90° RL S Bearing: Datu	urface m:		2.50 m HD O	perator: Matrix Drilling		
			illing Informa						Soil Description				Observations		
Penetration		Support	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary componen additional observations	, st Moisture	Condition Consistency / Relative Density	Hand Penetromete UCS (kPa)	r Structure, Zoning, Origin, Additional Observations		
		Z	SPT 0.50-0.95 m 3,11,28 N=39		41.5	- - 1		GC	Gravelly CLAY: medium to high plasticity, brown and dark grey, gravel is angular to sub-angular, up to 30 mm. Becomes dark grey				0.00: INFERRED FILL		
			SPT 1.50-1.95 m 10,13,16 N=29		40.5	2				C	VSt to H		1.50: SILTSTONE fragment observe within SPT sample		
		z	SPT 3.00-3.45 m 4.8,10 N=18		1 38.5 39.5	3			CLAY with gravel: medium to high plasticity brown, red and yellow, gravel is sub-angula up to 5 mm, trace sandstone fragments				4.0: INFERRED NATURAL		
AD/T · AD/V · WB · SPT ·	- Au - Au - W - St	ashb anda	SPT 4.50-4.95 m 7,9,14 N=23 drilling TC bit drilling V bit ore rd penetration te:	ØN	netrat	tion		> Infl ⊲ Par	tial Loss D - Disturbed Sample SPT - Standard Penetration ES - Environmental Sample	Test	D	rre Condition - Dry I - Moist / - Wet	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff		
AS ·	- Ρι - Αι	ish ti Iaer :	ibe screwing ious push tube 1		ng 76		meter	- 00	TW - Thin Walled LB - Large Disturbed Samp				VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact		

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Client:

Engineering Log - Non Cored Borehole

Mirvac

Borehole ID

BH14

								••	
							Page 2	2 of 2	
	Project N	o.:		PSM3	3530				
	Commen	ced:		18/12	/202	3			
	Complete	ed:		18/12	/202	3			
	Logged E	sy:		KQ					
	Checked	By:		AS					
-90°	RL Surfac	ce:	42	.50 m					
	Datum:		AH	ID	O	perator:	Matrix	Drilling	
Soil Descrip	tion						Observ	vations	
al Description			cy / ensity	Han	d				

Drill Hole				Mounting:		maccl 5 mm	nio Ge	eo 30	5	Inclination: -90° Bearing:	RL Surfa Datum:	ce:		2.50 HD	m	С	perator:	Matrix Drilling
		D	rilli	ng Informat	ion					Soil Desci	•							Observations
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio SOIL NAME: Plasticity, beh particle characteristics of component, colour, secondary additional observatic	n paviour or primary components, ns	Moisture Condition	Consistency / Relative Density	Pen	Han etror UCS (kPa	mete S I)	A	ructure, Zoning, Origin, dditional Observations
		z	>	SPT 6.00-6.45 m 3.4.5 N=9		36.5	- - - 6		СН	CLAY: high plasticity, brown mot ironstained <i>(continued)</i> Becomes brown		M M to W	VSt St	-				
						33.5 34.5 35.5	- - - - - - - - - - - - - - - - - - -			Hole Terminated at 6.45 m Target depth								
AD/T AD/V WB SPT PT AS	<i>Met</i> - Au - Au - W - Sta - Pu - Au	iger iger ashl and ish 1 iger	drilli drilli bore ard p ube scre	ing TC bit ing V bit penetration tes swing s push tube 1.		netrat o resis Re ng 76r	tance efusal		⊳ Infl ⊲ Par	later Samples a ow U - Undisturbed tial Loss D - Disturbed S SPT - Standard P mplete Loss ES - Environmer TW - Thin Wallec LB - Large Distu	d Sample Sample enetration Test ntal Sample	N	loistu D W W		Dry Moist			istency/Relative Den VS - Very soft S - Soft F - Firm VSt - Stiff H - Hard VL - Very loose L - Very loose MD - Medium dense D - Dense VD - Very dense

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BH15

P H	lient: rojec ole L ole P	t Na .oca	ion:	Refer t	eth E o PS	M353	30-018	BR Fig	gure 1	A2020 Zone 56	Commer Complete Logged E Checked	ed: 3y:					
	rill M ole D			d Mounting:		nacc i mm	hio Ge	eo 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ce:		8.20 r HD	n	Operator: Matr	ix Drilling
			Drill	ing Informat	ion					Soil Descrip	otion					Obse	rvations
MICHION	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of pri component, colour, secondary co additional observations	mary mponents,	Moisture Condition	Consistency / Relative Density	H Pene ( 000 (	Hand etrome UCS kPa)	Additiona	Zoning, Origin, I Observations
		z		SPT 0.50-0.95 m 6,10,13 N=23 ES 0.95 m		42.2	- - - 1		СІ	TOPSOIL: Silty CLAY: medium pla: yellow and brown, rootlets CLAY: high plasticity, dark brown n ironstained		М				0.20: INFERRED N	IATURAL
			Not Encountered	SPT 1.50-1.95 m 6,9,16 N=25		41.2	2		СН	CLAY: high plasticity, brown and re ironstained			VSt				
		z		SPT 3.00-3.45 m 6,14,14 N=28		 39.2 40.2	3		СН	Sandy CLAY: high plasticity, pale g grey, sand is fine grained	rey and	D to M					
				SPT 4.50-4.73 m 17,18/80mm H N=R	IB —					SILTSTONE: dark grey, low to med strength, slighly weathered Hole Terminated at 4.70 m Refusal	 lium			-		4.50: INFERRED E	BEDROCK
AAWSPAC	D/T - D/V - /B - PT - T - S -	Auge	er dril er dril hbore dard tube er scr	ling TC bit ling V bit e penetration tes e ewing us push tube 1.	t	R	stance efusal		⊳ Inflo ⊲ Par	ater Samples and DW U - Undisturbed Sa tial Loss D - Disturbed San SPT - Standard Pen nplete Loss ES - Environmenta TW - Thin Walled LB - Large Disturbe	ample nple etration Test I Sample	Λ	<b>foistu</b> D N W	// - D   - D   - N / - V	lry loist	VS - V S - S F - F St - S VSt - V H - F VL - V L - U MD - M	tiff ery stiff

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Borehole ID

BH16

Pr Ho	ient: ojec ole L ole F	t Na oca	ion:	Refer to	o PS	M353	30-018	BR Fig	jure 1	Comr Comp Logge A2020 Zone 56 Checl	ed By:				/12/ )	/202 /202	
	rill M ole D			d Mounting:		naccl i mm	hio Ge	eo 305	5	Inclination: -90° RL Su Bearing: Datur			40. AH	00 r D	n	0	perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Description							Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary component additional observations	Moisture	Condition	elative	Pene I	UCS kPa	neter S )	Structure, Zoning, Origin, Additional Observations
		z					-		CI	TOPSOIL: CLAY: medium plasticity, brown, rootlets Clayey GRAVEL: dark grey and grey, sub-angular to sub-rounded, up to 35 mm,	D t M		F				0.20: INFERRED FILL
				SPT 0.50-0.95 m 10,13,14 N=27 CBR 0.50-1.50 m		39.0	- - 1			clay is medium plasticity	D	,	D				
				SPT 1.50-1.95 m 3,3,6 N=9		38.0			СН	CLAY: high plasticity, brown mottled pale brown							1.50: INFERRED NATURAL
		z		SPT 3.00-3.45 m 2,4,5 N=9		37.0	3				М	1	St				
	iii			SPT 4.50-4.95 m 4,3,4 N=7		36.0	- 4 - - -			Becomes pale grey mottled brown							4.50: Ironstone gravel observed in S sample
VV	D/T - D/V - B - PT - - - -	was Stan Pusł Auge	er dril er dril hbore dard tube er scr	penetration test		R	stance efusal	•	> Infl ⊲ Par	Samples and Tests           ow         U         - Undisturbed Sample           ow         D         - Disturbed Sample           tial Loss         D         - Disturbed Sample           SPT         Standard Penetration 1           mplete Loss         ES         - Environmental Sample           TW         Thin Walled         LB           LB         - Large Disturbed Sample		Mo	M	re Co - D - N - V	)ry 1oist		Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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2019-03-06 Prj: PSM 3.02.0 2019-02-24

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Borehole ID

**BH16** Page 2 of 2 **Engineering Log - Non Cored Borehole** PSM3530 Project No .: Commenced: 19/12/2023 Completed: 19/12/2023 Logged By: KQ Checked By: AS Comacchio Geo 305 Inclination: -90° RL Surface: 40.00 m 125 mm Bearing: Datum: AHD Matrix Drilling Operator: Soil Description Observations Consistency / Relative Density Material Description Classification Symbol g Hand SOIL NAME: Plasticity, behaviour or particle characteristics of primary Moisture Condition Penetrometer Recovery Graphic I UCS component, colour, secondary components, additional observations RL Depth (kPa) (m) (m) 100 200 300 500 CLAY: high plasticity, brown mottled pale brown (continued) СН Μ St 34.0 6 СН CLAY: high plasticity, pale grey mottled dark grey M to W VSt 33.0 to H 7 CLAY: high plasticity, dark brown, ironstained, trace sandstone fragments and ironstone СН gravel w SILTSTONE: dark grey and grey, very low 7.80: INFERRED BEDROCK strength, slighly weathered 8 32. Hole Terminated at 7.95 m Target depth

Client: Mirvac Project Name: Elizabeth Enterprise Precinct Hole Location: Refer to PSM3530-018R Figure 1 Hole Position: 293496.0 m E 6250403.0 m N MGA2020 Zone 56 Drill Model and Mounting: Hole Diameter: **Drilling Information** Penetration Samples Structure, Zoning, Origin, Additional Observations Tests Method Support Water Remarks SPT 6.00-6.45 m 5,6,10 N=16 AD/T z SPT 7.50-7.95 m 12,17,35 N=52 ||||0 9 ω. |||| 
 Method
 Penetration

 AD/T - Auger drilling TC bit
 No resistance

 AD/V - Auger drilling V bit
 No resistance

 WB - Washbore
 No resistance

 SPT - Standard penetration test
 Provident and the standard penetration test

 PT - Push tube
 Refusal

 AS - Auger screwing
 Refusal

 CT - Continuous push tube 1.5m long 76mm diameter

 Consistency/Relative Density

 VS
 - Very soft

 S
 - Soft

 F
 - Firm

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose
 Samples and Tests Moisture Condition Water 
 Samples and Tests

 U
 - Undisturbed Sample

 D
 - Disturbed Sample

 SPT
 - Standard Penetration Test

 ES
 - Environmental Sample

 TW
 - Thin Walled

 LB
 - Large Disturbed Sample
 D M W - Dry - Moist - Wet  $\triangleright$ Inflow Partial Loss Complete Loss Loose Medium dense Dense Very dense Cemented Compact L MD D VD Ce C Logged in accordance with AS 1726:2017 Geotechnical site investigations

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BH17

Engi	ine	eel	rin	g Log - N	lor	n Co	ored	Bo	reho	le Project	No.:		PSM353	0
Clie				Mirvac						Comme		:	19/12/20	
Proj Hole										Comple Logged			19/12/20 KQ	23
Hole								-		A2020 Zone 56 Checke	-		AS	
Drill	Mc	odel	and	d Mounting:	Co	macc	hio Ge	eo 305	5	Inclination: -90° RL Surf	ace:	4	41.60 m	
Hole	e Di	iam	eter	:	125	5 mm				Bearing: Datum:		/	AHD (	Operator: Matrix Drilling
		I	Drill	ing Informat	ion					Soil Description				Observations
Denatration	renetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency /	Relative Density A 2000 CS 2000 CKPa 2000 CKPA	Additional Observations
		z							CI	TOPSOIL: CLAY: medium plasticity, brown	D to M	_		
				SPT 0.50-0.95 m 3,9,6 N=15		 40.6	- - - 1		GC	Clayey GRAVEL: dark grey and grey, sub-angular to sub-rounded, up to 30 mm, clay is medium plasticity	D	M	D	0.20: INFERRED FILL
			Not Encountered	SPT 1.50-1.95 m 1,4,9 N=13			- - 2 -		CI-CH	CLAY trace gravel: medium to high plasticity, grey and dark grey, gravel is sub-angular up to 10 mm of siltstone origin		s	t	
		Z	No	SPT 3.00-3.45 m 2,3,4 N=7		38.6			СН	CLAY: high plasticity, pale brown to brown mottled grey				3.00: INFERRED NATURAL
				SPT 4.50-4.95 m 3,3,4 N=7		37.6	4				м	F		4.50: Ironstone gravels observed in S sample
WB SPT PT AS	- A - V - V - S - A	Vasl Stan Push Auge	r dril r dril nbore dard tube r scr	penetration test		R	stance efusal		⊳ Inflo ⊲ Par	ater Samples and Tests w U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test SPT - Standard Penetration	st		ature Condition D - Dry M - Moist W - Wet	VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense
aaed ir	n acco	ordan	ce with	AS 1726:2017 Geote	echnica	l site inve	estigations							Ce - Cemented C - Compact

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BH17

Long the second	ct N Loca Pos Mode	ation: ition: el and neter <b>Drill</b>	Refer to 293475 d Mounting:	Comac 125 mn	530-018 5250299 chio Ge n Depth	8R Fiç 9.0 m	gure 1 N MG	A2020 Zone 56 Inclination: -90° Bearing: <b>Soil Descrip</b> Material Description	Commen Complet Logged Checked RL Surfa Datum:	ed: By: d By: ace:	41 Ał	19/ KQ AS .60 n ID		2023	
Hole I Hole F Drill M Hole [	Local Pos Mode Diar	ation: ition: el and neter <b>Drill</b>	Refer to 293475 d Mounting: :: ing Informati Samples Tests	o PSM35 5.0 m E 6 Comac 125 mn	530-018 5250299 chio Ge n Depth	8R Fig 9.0 m 9.305	gure 1 N MG	Inclination: -90° Bearing: <b>Soil Descrij</b>	Logged Checked RL Surfa Datum:	By: d By: ace:	Ał	KQ AS .60 n HD	!		perator: Matrix Drilling
Drill M Hole [		el ano meter <b>Drill</b>	d Mounting: :: ing Informati Samples Tests	Comac 125 mn	chio Ge	eo 30	5	Inclination: -90° Bearing: <b>Soil Descrij</b>	RL Surfa Datum:	ace:	Ał	.60 n HD		Op	
Hole [		Mater Mater	t <b>ing Informati</b> Samples Tests	125 mn	Depth		1	Bearing: Soil Descrip	Datum:		Ał	HD	n	Op	
	Summert	Mater	l <b>ing Informati</b> Samples Tests	ion	Depth	thic Log	ation	Soil Descrij		1				Op	
Penetration		Water	Samples Tests		Depth (m)	thic Log	ation		otion	1					Observations
Penetration			Tests	Recovery (m)	Depth (m)	thic Log	ation	Material Description		1	· `				Observations
		untered				Grap	Classification Symbol	SOIL NAME: Plasticity, beha particle characteristics of pl component, colour, secondary co additional observation	imary mponents,	Moisture Condition	Consistency / Relative Density	H Pene L (H	land trome JCS kPa)		Structure, Zoning, Origir Additional Observations
		Not Encountered	SPT 6.00-6.45 m 6,6,7 N=13	35.6	- - - 6-		СН	CLAY: high plasticity, pale brown t mottled grey <i>(continued)</i>	o brown	м	F 				
44	1							Hole Terminated at 6.45 m Target depth							
								5 1							
	Ì.			34.6	7-										
111	Ì.														
					1										
	1				-										
				33.6	8-										
				) (n											
	1			9	9-										
				32.	9-										
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	Ì.														
	1														
<u> </u>	Meth	od		Penetra	ation			ater Samples ar	d Tests	N		re Co		on	Consistency/Relative Den
AD/T - AD/V - VB - SPT - SPT - AS -	- Aug - Aug - Wa - Sta - Pus - Aug	ger dri ger dri shbor ndard sh tubo ger sci	penetration test	//////////////////////////////////////	Refusal				Sample nple letration Tes al Sample	t	M	- Di   - M / - W	oist		VS - Very soft S - Soft F - Firm VSt - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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Borehole ID

**BH18** 

Client Proje Hole Hole	ct Na Loca	tion	Refer to	o PS	M35	30-018	BR Fig	gure 1	Comm Comp Logge A2020 Zone 56 Check	eted: d By:				
Drill N Hole			d Mounting:		nacc 5 mm		eo 305	5	Inclination: -90° RL Su Bearing: Datum			2.90 HD		Operator: Matrix Drilling
		Drill	ling Informat	ion					Soil Description					Observations
Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components additional observations	Moisture	Consistency / Relative Density	Pene	Hand etromet UCS (kPa)	Additional Observations
			SPT 0.50-0.95 m 2,4,5 N=9		41.9			СІ	TOPSOIL: Silty CLAY: medium plasticity, brown and yellow, rootlets CLAY: high plasticity, dark brown mottled rec minor ironstaining	ī, -	St			0.20: INFERRED NATURAL
	Z	Not Encountered	SPT 1.50-1.95 m 5,9,11 N=20		40.9	2			Becomes pale grey and dark grey					
		-	SPT 3.00-3.45 m 5,11,14 N=25		 38.9 39.9	3				D ti M				
AD/T - AD/V -	Meth Aug	er dri er dri	SPT 4.50-4.83 m 9,23,25/30mm N=R ling TC bit lling TC bit	Pe	netrat	tion		⊳ Infl	SILTSTONE: extremely weathered, recover as CLAY: high plasticity, grey and dark grey Hole Terminated at 4.87 m Refusal ater Samples and Tests ow U - Undisturbed Sample tial Loss D - Disturbed Sample SPT - Standard Penetration T		E N	D - D A - N	onditio. Dry Aoist	4.50: INFERRED BEDROCK n Consistency/Relative Dens VS - Very soft S - Soft F - Firm
PT - AS -	<ul> <li>Star</li> <li>Pus</li> <li>Aug</li> </ul>	idard h tub er sci	penetration tes		Ring 76				nplete Loss Environmental Sample ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sampl		N	V - V	vel	St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented

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Borehole ID

BH19

Clie Pro Hol Hol	ject e Lo	ocat	ion:	Refer to	o PS	M353	30-018	BR Fig	gure 1	Com Com Logg A2020 Zone 56 Chec	ed By	d: /:			/12/ }	202 202	
Dril Hol				d Mounting:		naccl mm		eo 305	5	Inclination: -90° RL S Bearing: Datu		e:	52 A⊢	.60 i ID	m	0	perator: Matrix Drilling
		I	Drill	ing Informat	ion					Soil Description							Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary componen additional observations	ts, bitta	Condition	Consistency / Relative Density	Pene	UCS kPa	neter )	Structure, Zoning, Origin, Additional Observations
				SPT 0.50-0.95 m 4,5,8 N=13 ES 1.00 m		51.6			CL-CI CL-CI CH	TOPSOIL: CLAY trace sand: low plasticity, dark brown, sand is fine grained, rootlets observed CLAY trace sand and gravel: low to mediur plasticity, orange and red, sand is fine grained, gravel is sub-angular up to 10 mm CLAY: high plasticity, pale grey mottled red	/ n	D to M D to M	F to St				0.05: INFERRED FILL 0.60: INFERRED NATURAL
							-			Becomes pale grey and pale yellow							
		z		SPT 1.50-1.95 m 6,11,12 N=23		- 50.6	2			Becomes pale grey and brown							
				SPT 3.00-3.45 m 8,10,13 N=23		1 49.6	3-					м	VSt				
				SPT 4.00-4.45 m 5,7,12 N=19		 48.6	4										
		Z	4			n a 4 4				Non-last and Total			aist				Consistency/D-1-4
AD/\ WB	T - / V - / - \ - \ - \ F - /	Auge Wasl Stand Push Auge	r dril r dril bore lard tube r scr	penetration tes		R	stance efusal		⊳ Inflo ⊲ Par	ater Samples and Tests w U - Undisturbed Sample D - Disturbed Sample D - Disturbed Sample SPT - Standard Penetration nplete Loss Environmental Sample TW - Thin Walled LB - Large Disturbed Sample	9	М	M	re Cc - D - N - V	)ry 1oist	uon	Consistency/Relative Dens VS - Very soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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BH19 Page 2 of 2

E	Eng	gine	ee	ring	g Log - N	lor	n Co	ored	Bo	reho	le	Ρ	Project N	lo.:		Ρ	SM	35	30	
	Pro Ho	ent: oject le Lo le Po	ocat	ion:	Mirvac Elizabe Refer to 293054	PS	SM353	30-018	BR Fig	gure 1	A2020 Zone 56	C L	Commen Complete .ogged E Checked	ed: By:		2	1/1: 1/1: G S			
		ill Mo ole Di			0		maccl 5 mm	hio Ge	eo 305	5	Inclination: -90° Bearing:		RL Surfa Datum:	ce:		2.60 HD	m		Op	erator: Matrix Drilling
			I	Drilli	ng Informati	on					Soil Descri	ptio	n							Observations
	Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary c additional observation	avioui orimai compo	r or ry onents,	Moisture Condition	Consistency / Relative Density	Per	Ha netro UC (kF	ome SS Pa)		Structure, Zoning, Origin, Additional Observations
	ADIT		z	Not Encountered			.6			СН	CLAY: high plasticity, pale grey m (continued)	ottled	d red	М	VSt					
PSM 3.02.2 LIB.GLB Log PSM AUNONCORE BH NZ AU PSM8530.GPJ < <drawingfiese> 07/02/2024 10:00 10.03.00.09 Datgel Fence and Map Tool   LIb: PSM 3.02.1 2019-03-06 Pt; PSM 3.02.0 2019-02-24</drawingfiese>							43.6 44.6 45.6 46.				Hole Terminated at 6.00 m Target depth									
13.02.2. LIB.GLB Log PSM AU NONCORE E	AD/ WB	/T - A /V - A 3 - V 3 - V T - S - F - A	Auge Vasl Stano Push Auge	r drilli r drilli bore dard p tube r scre	penetration test		lo resis	stance efusal		⊳ Inflo ⊲ Par	ater Samples ar w U - Undisturbed tial Loss D - Disturbed Sa spT - Standard Per mplete Loss ES - Environment TW - Thin Walled LB - Large Disturb	Sam ample netra tal Sa	iple e ation Test ample		loistu D M W	- - / -	Dry Moi	st	<u> </u>	Consistency/Relative Density         VS       - Very soft         S       - Soft         F       - Firm         St       - Stiff         VS       - Very stiff         H       - Hard         VL       - Very loose         L       - Loose         MD       - Medium dense         D       - Dense         VD       - Very dense         Ce       - Cemented
PSM	Logged	d in acco	ordan	e with a	AS 1726:2017 Geote	chnica	al site inve	estigations												C - Compact

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BH20

Clier Proje Hole Hole	ect I Lo	cati	on:		eth E o PS	M35	30-018	R Fig	gure 1	A2020 Zone 56	Commer Complet Logged I Checked	ed: By:			12/202 12/202	
Drill   Hole				I Mounting:		nacc i mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	49 AH	.30 m HD		perator: Matrix Drilling
				ing Informat						Soil Descri						Observations
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary o additional observation	aviour or rimary components,	Moisture Condition	Consistency / Relative Density	H Penet U (k	and romete CS Pa)	r Structure, Zoning, Origir Additional Observations
		z		SPT 0.50-0.95 m 3.4,6 N=10		 48.3	- - - 1		СН	TOPSOIL: CLAY: high plasticity, dark brown, rootlets CLAY: high plasticity, brown mott ironstained		-	F			0.20: INFERRED NATURAL
				SPT 1.50-1.95 m 9,6,8 N=14		47.3						м	St			
		z		SPT 3.00-3.45 m 1,6,12 N=18		 46.3	3									
				SPT 4.50-4.85 m 10,22,8/50mm N=R		45.3	4		СН	SILTSTONE: extremely weathere as CLAY: high plasticity, grey and Hole Terminated at 4.80 m		-				4.50: INFERRED BEDROCK
AD/T AD/V WB SPT PT AS	<i>Mei</i> - Au - Au - W - St - Pu - Au	uger uger ash and ush uger	drill drill bore ard tube	ing TC bit ing V bit penetration tes ewing is push tube 1.	t	R	stance efusal		⊳ Infl ⊲ Par	Refusal <i>ater Samples a</i>	Sample ample netration Test tal Sample	<u> </u> л	D M	re Coi - Dr - Ma / - Wi	óist	Consistency/Relative Den VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cernented

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BH21

Pro Ho	ent: oject le Lo le P	ocat	ion:	Refer to	o PS	M35	30-018	BR Fig	gure 1	Comme Comple Loggec A2020 Zone 56 Checke	eted: I By:		20/12/202 20/12/202 KQ AS	
	ll Mo le D			Mounting:		nacc 5 mm	hio Ge	ieo 305 Inclination: -90° RL Surface: 46.10 m Bearing: Datum: AHD						perator: Matrix Drilling
				ing Informat						Soil Description				Observations
200	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture	Consistency / Relative Density	Hand Penetrometel UCS (kPa)	r Structure, Zoning, Origin, Additional Observations
		z		SPT 0.50-0.95 m 9,17,16 N=33		45.1	- - 1-		СН	CLAY with gravel: high plasticity, grey and brown, gravel is sub-angular up to 5 mm	D tc M	н		0.00: INFERRED FILL
				SPT 1.50-1.95 m 4,9,11 N=20 CBR 1.50-2.50 m		44.1	- - 2 -		СН	CLAY: high plasticity, brown				1.50: INFERRED NATURAL
		z		SPT 3.00-3.45 m 8,12,16 N=28		43.1	3				м	VSt to H		
ΛVΗ	/T - # /V - #	Nasi	d r dril r dril	SPT 4.50-4.92 m 8,17,20/120mn HB N=R ling TC bit ing TC bit 3	Pe		4		⊳ Infle	SILTSTONE: extremely weathered recovered as CLAY: high plasticity, pale grey Hole Terminated at 4.92 m Refusal ater Samples and Tests ow U - Undisturbed Sample tial Loss D - Disturbed Sample		Moistur Moistur	re Condition - Dry - Moist - Wet	4.50: INFERRED BEDROCK  4.50: INFERRED BEDROCK  Consistency/Relative Dens VS - Very soft S - Soft S - Soft F - Firm
SP <sup>.</sup> PT AS CT	T - S - F - A	Stan Push	dard tube	penetration test		ng 76r			<ul> <li>Cor</li> </ul>	tial Loss D - Disturbed Sample D - Disturbed Sample SPT - Standard Penetration Te ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample				St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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BH22

Pr Ho	lient: rojec ole L ole P	t Na oca	ion:	Refer t	o PS	M35	30-018	BR Fig	gure 1	A2020 Zone 56	Comme Complet Logged Checked	ed: By:					
	rill M ole D			d Mounting:		nacc 5 mm	hio Ge	eo 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:		.70 r HD	n	0	perator: Matrix Drilling
			Drill	ing Informat	ion					Soil Descr	iption						Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of f component, colour, secondary o additional observation	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Pene	Hand etrom UCS kPa)	neter	Structure, Zoning, Origin, Additional Observations
		z		SPT 0.50-0.95 m 11,12,11 N=23		 40.7			GC	Gravelly CLAY: medium plasticity is sub-angular to sub-rounded up siltstone origin	/, grey, gravel to 30 mm of						0.00: INFERRED FILL
			Not Encountered	SPT 1.50-1.95 m 6,6,7 N=13 ES 1.50 m		 39.7	2					D	St to VSt				
			Not End	SPT 3.00-3.45 m 3,4.4 N=8		38.7	3-		СН	CLAY: high plasticity, grey mottle	d brown			-			3.00: INFERRED NATURAL
				SPT 4.50-4.95 m 4,5,6 N=11		37.7	4		СН	CLAY trace gravel: high plasticity mottled yellow brown, gravel is a 20 mm		M	St				
AE WI SF PT AS CT	D/T - D/V - B - PT - T - S -	Auge	er dril er dril hbore dard tube er scr	ling TC bit ling V bit e penetration tes e ewing us push tube 1.		R	stance efusal		⊳ Infl ⊲ Par	ater Samples a bw U - Undisturbed tial Loss D - Disturbed S SPT - Standard Pe mplete Loss ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample enetration Tes tal Sample	л t	N	/ - D - D - N / - V	loist	ion	Consistency/Relative Dens VS - Very soft S - Soft St - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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Client:

Project Name:

Hole Location:

Hole Position:

Hole Diameter:

Penetration

Support

Water

Not Encountered

SPT

6.00-6.35 m

4,16,25/50mm HB N=R

Method

Drill Model and Mounting:

Mirvac

**Drilling Information** 

Samples

Tests

Remarks

125 mm

Recovery

RL Depth

(m) (m)

35.

34.7

6

7

Borehole ID

**BH22** Page 2 of 2 **Engineering Log - Non Cored Borehole** PSM3530 Project No.: Commenced: 19/12/2023 Elizabeth Enterprise Precinct Completed: 19/12/2023 Refer to PSM3530-018R Figure 1 Logged By: KQ 293592.0 m E 6250172.0 m N MGA2020 Zone 56 Checked By: AS Comacchio Geo 305 Inclination: -90° RL Surface: 41.70 m Bearing: Datum: AHD Matrix Drilling Operator: Soil Description Observations Consistency / Relative Density Material Description Classification Symbol g Hand SOIL NAME: Plasticity, behaviour or particle characteristics of primary Structure, Zoning, Origin, Additional Observations Moisture Condition Penetrometer Graphic I UCS component, colour, secondary components, additional observations (kPa) 100 200 300 500 CLAY trace gravel: high plasticity, pale grey mottled yellow brown, gravel is angular up to СН 20 mm (continued) St Μ 6.00: INFERRED BEDROCK SILTSTONE: pale grey, moderately to slightly weathered, very low strength Hole Terminated at 6.35 m Target depth

AD/T PSM 3,02.0 2019-02-24 1111 ||||2019-03-06 Pri: | | | | ||||Tool | Lib: PSM 3.02.1 1111 nd Map 1111 1111 0.03.00.09 Datgel ||||||||||||0.00 07/02/2024 PSM3530.GPJ ||||RH N7 AU ALL NONCORF SM 8 LIB.GLB 1 0.00

PSM

33.7 8 32.7 9 
 Method
 Penetration

 AD/T - Auger drilling TC bit
 No resistance

 AD/V - Auger drilling V bit
 No resistance

 WB - Washbore
 No resistance

 SPT - Standard penetration test
 Provident and the standard penetration test

 PT - Push tube
 Refusal

 AS - Auger screwing
 Refusal

 CT - Continuous push tube 1.5m long 76mm diameter

 Consistency/Relative Density

 VS
 - Very soft

 S
 - Soft

 F
 - Firm

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose
 Samples and Tests Moisture Condition Water Samples and rests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample D M W - Dry - Moist - Wet  $\triangleright$ Inflow Partial Loss Complete Loss Loose Medium dense Dense Very dense Cemented Compact L MD D VD Ce C Logged in accordance with AS 1726:2017 Geotechnical site investigations

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Borehole ID

BH23

Clien Proje Hole Hole	ct I Lo	cati	on:	Refer to	o PS	M35	30-018	BR Fig	ure 1	Comme Complet Logged A2020 Zone 56 Checker	ed: By:		19/12/20: 19/12/20: KQ AS	
Drill N Hole				I Mounting:		nacc 5 mm	hio Ge	eo 305	5	Inclination: -90° RL Surfa Bearing: Datum:	ace:	41. AH	.60 m ID C	Operator: Matrix Drilling
				ing Informat						Soil Description				Observations
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetromete UCS (kPa)	er Structure, Zoning, Origin, Additional Observations
		z		SPT 0.50-0.95 m 5,7,12 N=19		40.6	- - - 1-		GC	Gravelly CLAY: medium plasticity, grey, gravel is sub-angular to sub-rounded up to 30 mm of siltstone origin				0.00: INFERRED FILL
				SPT 1.50-1.95 m 18,20,16 N=36			- - 2- -				D to M	VSt to H		
		z		SPT 3.00-3.45 m 4,5,7 N=12		38.6	- 3 - -		СН	CLAY: high plasticity, grey mottled brown				3.00: INFERRED NATURAL
	               	thoo	1	SPT 4.50-4.95 m 4,3,5 N=8	Pe	9.76	4 — - - -		W	ater Samples and Tests	M	St	e Condition	Consistency/Relative Dens
AD/T - AD/V - WB - SPT - PT - AS -	- Aı - Aı - W - St - Pı - Aı	uger uger ash and ush uger	drill drill bore ard ube scr	penetration test		o resis	stance efusal	•	> Inflo ⊲ Par		t	D M	- Dry - Moist - Wet	VS - Very soft S - Soft F - Firm St - Stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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BH23

P H	ilient: rojec lole L lole F	t Na .oca	tion:	Refer to	o PS	M35	30-018	R Fig	gure 1	A2020 Zone 56	Commer Complet Logged Checked	ed: By:					
	rill M lole D			d Mounting:		macc 5 mm		eo 305 Inclination: -90° RL Surface: 41.60 Bearing: Datum: AHD					m	0	perator: Matrix Drilling		
				ing Informat						Soil Descrip							Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behar particle characteristics of pr component, colour, secondary cc additional observations	imary mponents,	Moisture Condition	Consistency / Relative Density	Pen	Hani letror UCS (kPa	netei S	r Structure, Zoning, Origin, Additional Observations
						9.	-		СН	CLAY: high plasticity, grey mottled (continued)	brown		St	01	30	4( 5(	
		Z		SPT 6.00-6.45 m 6,9,15 N=24		 34.6 35.6	6— - - 7— -					м	VSt				6.40: Ironstone gravel observed
						33.6	8			Hole Terminated at 8.20 m Target depth							
	D/T - D/V -	<b>lethc</b> Auge Auge	er dril er dril	ling TC bit ling V bit	-	9: 25: netral	9 — 9 — - - - - - - - - - - - - - - - - - - -		⊳ Infl	<b>fater Samples an</b> ow U - Undisturbed Sa D - Disturbed Sa	Sample		loistu D		condi Dry Moist		Consistency/Relative Dens VS - Very soft S - Soft
w	/B - PT - T - S -	Was Stan Push Auge	hbore dard tube er scr	e penetration test		R	efusal			tial Loss D - Disturbed Sa SPT - Standard Per ES - Environment TW - Thin Walled LB - Large Disturb	al Sample	t	Ŵ	V - 1	Wet		VS - Very soft S - Soft F - Firm St - Stiff H - Hard VL - Very losse L - Loose MD - Medium dense D - Dense VD - Very dense

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Borehole ID

BH24

Pi He	lient: rojec ole L ole F	t Na .oca	tion	Refer to	eth E o PS	M353	30-018	BR Fig	gure 1	Comme Comple Logged A2020 Zone 56 Checke	ted: By:		19/12/20: 19/12/20: KQ AS	
	rill M ole D			d Mounting:		macc i mm	hio Ge	eo 305 Inclination: -90° RL Surface: 42.20 m Bearing: Datum: AHD						Operator: Matrix Drilling
				ing Informat						Soil Description				Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetromete UCS (kPa)	Additional Observations
		z		SPT 0.15-0.60 m 7,13,9 N=22					CI	Gravelly CLAY: medium plasticity, grey, grave is sub-angular to sub-rounded up to 30 mm of siltstone origin				0.00: INFERRED FILL
				SPT 1.50-1.84 m 5,5,10/40mm HB		41.2				Becomes grey mottled brown	D to M	VSt to H		
		z	Not Encountered	N=R		 40.2	2							
				SPT 3.00-3.45 m 4,6,7 N=13		39.2	3		СН	CLAY: high plasticity, grey mottled brown, trace rootlets				3.00: INFERRED NATURAL
						38.2	4				М			
				SPT 4.50-4.95 m 10,12,15 N=27			_		CH	Sandy CLAY: high plasticity, brown and grey, sand is fine to medium grained	-	VSt		
	D/T - D/V - IB - PT - F - S -	Auge	er dri er dri hbor dard n tube er sci	lling TC bit ling V bit e penetration test e rewing us push tube 1.5			stance efusal		⊳ Infl ⊲ Par	Samples and Tests           Dw         U           Disturbed Sample           tial Loss         D           mplete Loss         SPT - Standard Penetration Te           ES - Environmental Sample         EW           TW - Thin Walled         LB           LB - Large Disturbed Sample         Sample Sample		D M	re Condition - Dry - Moist - Wet	Consistency/Relative Den VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact

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BH24

Page 2 of 2 PSM3530

	ent:		me:	Mirvac Elizabe	th ⊏	ntern	risa Dr	ecino	rt		Comme Complet					/202 /202	
	-		tion:								Logged			K		202	25
Hol	le P	osit	ion:	293723	.0 m	n E 62	249987	7.0 m	N MG	A2020 Zone 56	Checked	d By:		A	S		
				0			hio Ge	o 30	5	Inclination: -90°	RL Surfa	ace:		.20	m		
Hol	le D	lam	eter	:	125	5 mm				Bearing:	Datum: AF					0	operator: Matrix Drilling
		1	Drill	ing Informati	on			Soil Description									Observations
:	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio SOIL NAME: Plasticity, bel particle characteristics of component, colour, secondary additional observatio	naviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hand etror UCS (kPa	nete S	r Structure, Zoning, Origi Additional Observation
		z		SPT 6.00-6.45 m 7,11,14 N=25		36.2	- - - 6		СН	Sandy CLAY: high plasticity, bro sand is fine to medium grained	wn and grey, continued)	м	VSt			4 0	
						35.2	7			Hole Terminated at 6.45 m Target depth							
						 33.2 34.2	8										
AD/ WB	Υ-/ Υ-/ Γ-: - Ι	Auge Was Stan Push Auge	er dril er dril hbore dard tube er scr	penetration test	N	R	stance efusal		⊳ Infl ⊲ Par		Sample enetration Tes ntal Sample d		M	- [	Dry Moist		Consistency/Relative Der VS - Very soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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Borehole ID

BH25

Pr Ho	ient: ojec ole L ole P	t Na .oca	tion	Refer t	o PS	M35	30-018	BR Fig	gure 1	Comme Comple Logged A2020 Zone 56 Checke	ted: By:		19/12/20 19/12/20 KQ AS	
	ill M ble D			d Mounting:		nacc 5 mm	hio Ge	eo 305	5	Inclination: -90° RL Surf Bearing: Datum:	ace:	43 AH	.30 m <del>I</del> D	Operator: Matrix Drilling
			Drill	ling Informat	ion					Soil Description				Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetrome UCS (kPa)	Additional Observations
		z		SPT 0.50-0.95 m 6,22,29 N=51		 42.3	- - 1		СІ	Gravelly CLAY: medium plasticity, grey, gravel is sub-angular to sub-rounded up to 30 mm of siltstone origin				0.00: INFERRED FILL
			Not Encountered	SPT 1.50-1.95 m 13,7,8 N=15		41.3	- - 2 -				D to M	VSt to H		
		z	Not Er	SPT 3.00-3.45 m 3,3,6 N=9		1 40.3	3		СН	CLAY: high plasticity, brown and yellow mottled grey, trace rootlets				3.00: INFERRED NATURAL
				SPT 4.50-4.95 m 2,5,12 N=17		39.3	4		СН	Becomes yellow mottled pale grey Sandy CLAY: high plasticity, brown and grey, sand is fine to medium grained	М	VSt		
VV	D/T - D/V - B - PT - - -	Was Stan Pusł Auge	er dri er dri hbor dard n tube er sci	penetration tes	t N	R	stance efusal		⊳ Infl ⊲ Par	later Samples and Tests ow U - Undisturbed Sample tial Loss D - Disturbed Sample splete Loss SPT - Standard Penetration Tes mplete Loss ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		D M	re Conditio - Dry - Moist - Wet	on Consistency/Relative Den VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented

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Clien Proje Hole Hole	ect Lo	cati	ion:	Mirvac Elizabe Refer to	o PS	M353	30-018	R Fig	gure 1	A2020 Zone 56	Commer Complet Logged Checked	ed: By:					
	Мо	del	and	Mounting:	Cor		hio Ge			Inclination: -90° Bearing:	RL Surfa		43 Aŀ	.30		С	operator: Matrix Drilling
		Ľ	Drilli	ing Informati	ion			Soil Description									Observations
Penetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary o additional observation	aviour or rimary components,	Moisture Condition	Consistency / Relative Density	Per	Han etror UCS (kPa	d nete S I)	r Structure, Zoning, Origin, Additional Observations
		z		SPT 6.00-6.45 m 12,13,10 N=23		37.3	- - - 6		СН	Sandy CLAY: high plasticity, brov sand is fine to medium grained (c	n and grey, ontinued)	м	VSt				
						– 36.3	7			Hole Terminated at 6.45 m Target depth							
						35.3	8										
AD/T AD/V WB SPT PT AS	   	lash tanc ush uge	r drill r drill Ibore lard tube r scre	penetration test		R	stance efusal		⊳ Inflo ⊲ Par	ater Samples a bw U - Undisturbed tial Loss D - Disturbed S SPT - Standard Pe nplete Loss ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample netration Test tal Sample	L t	M	-			Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Cempatci

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Borehole ID

BH26

Clien Proje Hole Hole	ect N Loc	atior	: Refer t	eth E o PS	M353	30-018	R Fig	jure 1	A2020 Zone 56	Commer Complet Logged Checked	ed: By:						
Drill I Hole			nd Mounting: r:		nacc mm	nio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:		4.70 HD	m	0	Operator: Matrix Drilling	
		Dri	lling Informat	ion					Soil Descri	ption						Observations	
Penetration	C. Construction	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary c additional observation	rimary omponents,	Moisture Condition Consistency /		Hand Penetromete UCS (kPa)		d neter	er Structure, Zoning, Origin, Additional Observations	
		Not Encountered	SPT 0.50-0.95 m 3,5,9 N=14 SPT 1.50-1.95 m 6,7,8 N=15		42.7 43.7	- - - - - - - - - - - - - - - - - - -		СІ-СН	CLAY trace gravel: medium to hig brown, gravel up to 5 mm		-					0.00: INFERRED FILL	
		Not Enc	SPT 3.00-3.45 m 3.5.8 N=13		40.7 41.7	- 3- - - - - - - - - - - - - - - - - -			Becomes pale grey mottled yellov Becomes pale brown	v	М	St					
AD/T AD/V WB SPT SPT AS	- Pu - Au	ger d ger d shbo ndar sh tul ger s	SPT 4.50-4.95 m 4.6,9 N=15 illing TC bit illing V bit re d penetration tes be prevving pus push tube 1.	t	R	tance efusal	•	$>$ Inflo $\lhd$ Par	ater Samples a w U - Undisturbed tial Loss D - Disturbed Sa SPT - Standard Pe mplete Loss ES - Environmeni TW - Thin Walled LB - Large Distur	Sample ample netration Test al Sample		N	ure C - [ 1 - M / - \	Dry ∕loist		Consistency/Relative Den VS - Very soft S - Soft F - Firm VSt - Stiff H - Hard VL - Very soft VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense	

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BH26

E	ngi	gineering Log - Non Cored Borehole												PSM3530				
	Clien Proje Hole Hole	ct N Loca	ation	: Refer t	eth E to PS	M35	30-018	BR Fig	gure 1	A2020 Zone 56	Comme Comple Logged Checke	ted: By:			)/12 ຊ	202 2/202		
		Mod	el an	d Mounting:	Со		hio Ge			Inclination: -90° Bearing:	RL Surfa Datum:	-	44 AH	.70		C	Operator: Matrix Drilling	
			Dri	lling Informat	tion					Soil Descrip	Soil Description						Observations	
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of pri component, colour, secondary co additional observations	mary mponents,	Moisture Condition	Consistency / Relative Density	Pen	UC: (kPa	mete S	Additional Observations	
AD/T			Not Encountered	SPT 6.00-6.45 m 4,5,9 N=14		38.7	6-		СН	CLAY: high plasticity, brown mottled (continued)	1 grey	м	St					
							-			Hole Terminated at 6.45 m Target depth								
2.1 2019-03-06 Prj: PSM 3.02.0 2019-02-24						37.7	- 7											
.00.09 Datgel Fence and Map Tool   Lib: PSM 3.0						36.7	8											
302.2 LIB Lug PSM AUNONCOFE BH NZ AU PSM8530.GPJ < <drawmgfile> 07/02/2024 10:00 10.0330.09 Datest Fence and Map Tool Lub: PSM 3.02.1 2019-03-06 Prj. PSM 3.02.0 2019-032-04 PSM 3</drawmgfile>						 35.7	9											
5	AD/T AD/V SPT PT AS CT	⊥ - Aug - Aug - Va - Sta - Pus - Aug - Cor	ger dr ger dr shbo ndaro ndaro sh tub ger so ntinuc	d penetration tes	5m lo	R ng 76	stance efusal mm diar		⊳ Infl ⊲ Par	ater Samples and bw U - Undisturbed S tial Loss D - Disturbed San SPT - Standard Pen nplete Loss ES - Environmenta TW - Thin Walled LB - Large Disturbe	ample ople etration Tes Sample		foistur D M W	re C - 1 - 1	Ory Vois Vet	t	<ul> <li>Consistency/Relative Density</li> <li>VS - Very soft</li> <li>S - Soft</li> <li>F - Firm</li> <li>St - Stiff</li> <li>VS - Very stiff</li> <li>H - Hard</li> <li>VL - Very loose</li> <li>L - Loose</li> <li>MD - Medium dense</li> <li>D - Dense</li> <li>VD - Very dense</li> <li>C - Cemented</li> <li>C - Compact</li> </ul>	

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BH27

Client:MirvacProject Name:Elizabeth Enterprise PrecinctHole Location:Refer to PSM3530-018R Figure 1Hole Position:293379.0 m E 6250040.0 m N MGA2020 Zone 56												nced: ted: By:			12/202 12/202	
								-		A2020 Zone 56	Checked	-		AS		
				d Mounting:			hio Ge	eo 305	5	Inclination: -90°	RL Surfa	ace:		.90 n		
H	ole D	)iam	eter	:	125	mm				Bearing:	Datum:		AH	HD	0	perator: Matrix Drilling
		_	Drill	ing Informat	ion					Soil Descr	iption		-			Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of p component, colour, secondary o additional observation	aviour or orimary components,	Moisture Condition	Consistency / Relative Density	H Penet L (k	and rometer CS Pa)	r Structure, Zoning, Origin, Additional Observations
				SPT	77		-		CI	Gravelly CLAY: medium plasticity gravel is sub-angular to sub-rour mm	nded up to 30	D to M				0.00: INFERRED FILL
				0.50-0.95 m 8,12,12 N=24		44.9	- - 1-		СН	CLAY: high plasticity, brown and	yellow		VSt			
				SPT 1.50-1.95 m 7,7,6 N=13 ES 1.50 m			-		СІ-СН	Sandy Gravelly CLAY: medium tr plasticity, dark brown and red, sa grained, gravel is sub-angular to up to 5 mm	ind is fine					
		z	Not Encountered	E3 1.30 m		 43.9	2		СН	CLAY: high plasticity, pale grey i	nottled brown					2.00: INFERRED NATURAL
			Not E	SPT 3.00-3.45 m 4,6,10		 42.9	3-					М	St to			
				N=16			-						VSt			
						41.9	4									
				SPT 4.50-4.95 m 4,5,8 N=13			-									
vv	D/T - D/V - B - PT - T - S -	was Star Pusl Aug	er dril er dril hbon dard n tube er sci	penetration test		R	stance efusal		> Infl ⊲ Par	ater         Samples a           bw         U         Undisturbed           bw         D         Disturbed S           tial Loss         D         Disturbed S           mplete Loss         SPT - Standard Pe           ES - Environmer         TW - Thin Walled           LB         Large Disturber	l Sample ample enetration Tes ital Sample		D M	re Co. - Dr - Mr / - W	ndition y pist et	Consistency/Relative Dens VS - Very soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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	lient: rojec		me <sup>.</sup>	Mirvac Elizabe	th F	ntern	rise Pr	ecino	ct		Commence Completed				2/20 2/20		
Н	ole L	oca	tion:	Refer to	o PS	M35	30-018	R Fig	gure 1		Logged By: KQ					-	
	ole P				-	-				A2020 Zone 56	Checked B	-		AS			
	rill M ole D			I Mounting:		nacc 5 mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surface Datum:	e:	45. AH	.90 m ID		perator: Matr	ix Drilling
			Drill	ing Informat	ion					Soil Descript	ion					-	rvations
										Material Description			/ sity				
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	SOIL NAME: Plasticity, behavi particle characteristics of prin component, colour, secondary con additional observations	our or hary hponents, so No	Condition	Consistency Relative Den	Ha Peneti U (kl	and comete CS Pa)	r Structure Additiona	, Zoning, Origin, al Observations
			ountered				-		СН	CLAY: high plasticity, pale grey mo (continued)	ttled brown						
		z		SPT 6.00-6.45 m 7,9,13 N=22		39.9	6				,	м	St to VSt				
ŕ							-			Hole Terminated at 6.45 m Target depth							
						38.9	7-										
						.,											
						37.9	8-										
						(7)											
						36.9	9-										
						ñ											
W SF P AS	D/T - D/V - /B - PT - T - S -	Was Stan Push Auge	er drill er drill hbore dard tube er scr	penetration tes		R	stance efusal		⊳ Infl ⊲ Par	ater Samples and bw U - Undisturbed Sa tial Loss D - Disturbed Sam SPT - Standard Pene nplete Loss ES - Environmental TW - Thin Walled LB - Large Disturbe	ample ple tration Test Sample	М	D M	re Cor - Dr - Mc - We	/ vist	VS - V S - S F - F St - S VSt - V H - H VL - V L - U L - L	ititf /ery stiff lard /ery loose oose Medium dense
AS C	S	Auae	er scr	ewina				neter		LB - Large Disturbe	d Sample					VL - V L - L MD - N	erv loose

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Borehole ID

**BH28** 

Client: Project Hole L Hole P	t Na ocat	ion:	Refer to	o PS	M353	30-018	R Fig	gure 1	A2020 Zone 56	Commenced Completed: Logged By: Checked By:		21/12/ 21/12/ BG AS		
Drill Mo Hole D			I Mounting:		nacc mm	nio Ge	o 30	5	Inclination: -90° Bearing:	RL Surface: Datum:	49 Al-	.60 m <del>I</del> D	Or	perator: Matrix Drilling
			ing Informati						Soil Descript					Observations
Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavio particle characteristics of prim component, colour, secondary com additional observations	ponents, Normanian Strict	Consistency / Relative Density	Hand Penetron UCS (kPa	neter ; )	Structure, Zoning, Origin Additional Observations
	N	Not Encountered	SPT 0.50-0.95 m 11,13,10 N=23 SPT 1.00-1.45 m 10,14,10 N=24 CBR 1.00-3.50 m ES 2.50 m SPT 3.00-3.45 m 12,17,14 N=31		45.6 46.6 47.6 48.6			CH	TOPSOIL: CLAY with gravel and sal plasticity, dark brown, sand is fine gr gravel is sub-angular up to 10 mm, r observed CLAY: medium to high plasticity, pal mottled yellow, iron stained Becomes pale grey mottled orange CLAY: high plasticity, pale grey and Becomes pale grey mottled yellow	ained, ootlets / e grey /	VSt			0.15: INFERRED NATURAL
AD/T - 7 AD/V - 7 WB - 1 SPT - 1 PT - 1 AS - 7	Wasl Stan Push Auge	r dril r dril nbore dard tube r scr	penetration test	N	R	tance efusal		⊳ Infl ⊲ Par	iater Samples and ow U - Undisturbed Sa tial Loss D - Disturbed Sam SPT - Standard Pene mplete Loss ES - Environmental TW - Thin Walled LB - Large Disturbed	imple ple tration Test Sample	D M	re Condi - Dry - Moist - Wet		Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Medium dense

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2019-03-06 Pri: PSM 3.02.0 2019-02-24

Tool | Lib: PSM 3.02.1

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PSM.

.02.2. LIB.GLB Log

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**Engineering Log - Non Cored Borehole** 

Borehole ID

**BH28** Page 2 of 2

PSM3530

Project No.:

Client: Mirvac Commenced: 21/12/2023 Project Name: Elizabeth Enterprise Precinct Completed: 21/12/2023 Hole Location: Refer to PSM3530-018R Figure 1 Logged By: ВG Hole Position: 293289.0 m E 6250052.0 m N MGA2020 Zone 56 Checked By: AS Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 49.60 m Hole Diameter: 125 mm Bearing: Datum: AHD Matrix Drilling Operator: **Drilling Information** Soil Description Observations Consistency / Relative Density Material Description Classification Symbol g Hand Samples Penetration SOIL NAME: Plasticity, behaviour or particle characteristics of primary Structure, Zoning, Origin, Additional Observations Moisture Condition Penetrometer Recovery Graphic L Tests Method Support UCS Water Remarks component, colour, secondary components, additional observations (kPa) RL Depth (m) (m) 100 200 300 500 CLAY: high plasticity, pale grey and pale red (continued) СН Not Encountered D to н AD z Μ ശ ŝ Hole Terminated at 6.00 m Target depth 42.6 7 1111 ||||||||| | | | ||||| | | |41.6 1111 8 1111 1111 1111 ||||||||||||||||40.6 9 |||||||| 
 Method
 Penetration

 AD/T - Auger drilling TC bit
 No resistance

 AD/V - Auger drilling V bit
 No resistance

 WB - Washbore
 No resistance

 SPT - Standard penetration test
 Provident and the standard penetration test

 PT - Push tube
 Refusal

 AS - Auger screwing
 Refusal

 CT - Continuous push tube 1.5m long 76mm diameter

 Consistency/Relative Density

 VS
 - Very soft

 S
 - Soft

 F
 - Firm

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose
 Samples and Tests Moisture Condition Water Samples and rests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample D M W - Dry - Moist - Wet  $\triangleright$ Inflow Partial Loss Complete Loss Loose Medium dense Dense Very dense Cemented Compact L MD D VD Ce C Logged in accordance with AS 1726:2017 Geotechnical site investigations

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Borehole ID

BH29

						<b>^</b>						5014050	
С	lient	:		g Log - N Mirvac						Comme	nced:		23
	Projec Iole L									Comple Logged		21/12/20: BG	23
	lole F									A2020 Zone 56 Checker	AS		
				d Mounting:			hio Ge	o 30	5	Inclination: -90° RL Surfa	ace:	56.90 m	
H	lole [	Diam	eter	:	125	5 mm				Bearing: Datum:		AHD C	operator: Matrix Drilling
			Drill	ing Informat	ion					Soil Description			Observations
Motiod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density 800 (eAs) 800 (eAs) 800 (each 800 (	r Structure, Zoning, Origin Additional Observations
				SPT 0.50-0.95 m 4,9,9			-		CL CH	TOPSOIL: CLAY trace sand: low plasticity, brown and pale grey, sand is fine grained, (rootlets observed CLAY: high plasticity, pale grey mottled yellow	D to ∧ <u>M</u> /		0.10: INFERRED NATURAL
				N=18		 55.9	1			Becomes orange and brown	D to M		
			Not Encountered	SPT 1.50-1.95 m 3,7,11 N=18			2			Becomes pale grey mottled red		VSt	
			Not	SPT 3.00-3.45 m 5,9,8 N=17		53.9	3-				м		
				SPT 4.00-4.45 m 9,14,19 N=33		52.9	4			Becomes pale red and pale grey		н	
w	D/T - D/V - /B - PT - T - S -	Was Stan Pusl Auge	er dril er dril hbore dard tube er scr	penetration test	t N	R	stance efusal		⊳ Inflo ⊲ Par	Samples and Tests           ow         U         - Undisturbed Sample           ow         D         - Disturbed Sample           tial Loss         SPT         Standard Penetration Test           nplete Loss         ES         - Environmental Sample           TW         Thin Walled         LB         - Large Disturbed Sample		loisture Condition D - Dry M - Moist W - Wet	Consistency/Relative Den. VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense
	ged in ac												Ce - Cemented C - Compact

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2019-03-06 Pri: PSM 3.02.0 2019-02-24

Tool | Lib: PSM 3.02.1

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PSM.

.02.2. LIB.GLB Log

PSM

**Engineering Log - Non Cored Borehole** 

Borehole ID

**BH29** Page 2 of 2

PSM3530

Project No.:

Client: Mirvac Commenced: 21/12/2023 Project Name: Elizabeth Enterprise Precinct Completed: 21/12/2023 Hole Location: Refer to PSM3530-018R Figure 1 Logged By: ВG Hole Position: 293083.0 m E 6250078.0 m N MGA2020 Zone 56 Checked By: AS Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 56.90 m Hole Diameter: 125 mm Bearing: Datum: AHD Matrix Drilling Operator: **Drilling Information** Soil Description Observations Consistency / Relative Density Material Description Classification Symbol g Hand Samples Penetration SOIL NAME: Plasticity, behaviour or particle characteristics of primary Structure, Zoning, Origin, Additional Observations Moisture Condition Penetrometer Recovery Graphic L Tests Method Support UCS Water Remarks component, colour, secondary components, additional observations (kPa) RL Depth (m) (m) 100 200 300 500 CLAY: high plasticity, pale grey mottled yellow (continued) СН Not Encountered н Μ z ი 50. Hole Terminated at 6.00 m Target depth 49.9 7 1111 ||||||||| | | | ||||||||48.9 1111 8 1111 1111 1111 ||||||||||||||||47.9 9 |||||||| 
 Method
 Penetration

 AD/T - Auger drilling TC bit
 No resistance

 AD/V - Auger drilling V bit
 No resistance

 WB - Washbore
 No resistance

 SPT - Standard penetration test
 Provident and the standard penetration test

 PT - Push tube
 Refusal

 AS - Auger screwing
 Refusal

 CT - Continuous push tube 1.5m long 76mm diameter

 Consistency/Relative Density

 VS
 - Very soft

 S
 - Soft

 F
 - Firm

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose
 Samples and Tests Moisture Condition Water Samples and rests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample D M W - Dry - Moist - Wet  $\triangleright$ Inflow Partial Loss Complete Loss Loose Medium dense Dense Very dense Cemented Compact L MD D VD Ce C Logged in accordance with AS 1726:2017 Geotechnical site investigations

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BH30

Client Projec Hole I Hole I	ct N Loca	tion	Refer to	o PS	M353	30-018	R Fig	gure 1	A2020 Zone 56	Commenc Completed Logged By Checked E	d: /:					
Drill N Hole I			d Mounting:		nacc i mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surface Datum:	e:	53 A⊢	.50 r ID	n	O	perator: Matrix Drilling
		Dril	ling Informat	ion					Soil Descript	ion						Observations
Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavi particle characteristics of prir component, colour, secondary cor additional observations	our or g nary f nponents, v	Condition	Consistency / Relative Density	۲ Pene ( 000	Hand trom JCS kPa)	eter	Structure, Zoning, Origin Additional Observations
	           		SPT 0.50-0.95 m 7,8,8 N=16			-		CL-CI CH	TOPSOIL: CLAY trace sand: low to plasticity, orange and brown, sand i grained, rootlets observed CLAY: high plasticity, pale grey, iror	s fine –	M					0.15: INFERRED NATURAL
			ES 1.00 m		 52.5	1			Becomes pale grey mottled red		D	St to VSt				
		Not Encountered	7,10,5 N=15		51.5	2-						VOL				
	           	Not En	SPT 3.00-3.45 m		50.5	3-		СН СІ-СН	CLAY: high plasticity, pale grey and brown CLAY: medium to high plasticity, da ironstained		м м					
			3,12,10 N=22		 49.5	4					м	VSt				
AD/T - AD/V - WB - SPT - PT - AS -	VVa Sta Pus Aug	er dri er dri shbor ndard h tub er sc	penetration test		R	stance efusal		⊳ Infle ⊲ Par	SILTSTONE: extremely weathered as CLAY: high plasticity, grey and b ater Samples and bw U - Undisturbed Sam tial Loss D - Disturbed Sam SPT - Standard Pene ES - Environmental TW - Thin Walled LB - Large Disturbed	rown T <b>Tests</b> ample ple tration Test Sample	M	oistui D M W	re Co - D - M - W	ry loist	ion	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense

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BH30

P ⊦	Client: Projec Hole L	ocat	tion:	Mirvac Elizabe Refer to	D PS	M353	30-018	BR Fig	gure 1		Comme Comple Logged	ted: By:		21/12/20 21/12/20 BG	
	Hole P Drill M						hio Ge			A2020 Zone 56 Inclination: -90°	Checke RL Surf		53	AS 3.50 m	
H	Hole D					mm		Bearing: Datum:					A	HD (	Operator: Matrix Drilling
	1	Drilling Information							1	Soil Descr	iption	1			Observations
INIEthoa	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of component, colour, secondary additional observatio	aviour or orimary components,	Moisture Condition	Consistency / Relative Densitv	Hand Penetromete UCS (kPa) ♀ ႙ ႙ ♀ ႙	Additional Observations
AUI		Z	Not Encountered		-	46.5 47.5	- - - 6 - - - - - - - - -		СН	SILTSTONE: extremely weather as CLAY: high plasticity, grey an (continued)		м	VSt		
					-	44.5 45.5	- 8- - - - 9-			Hole Terminated at 7.50 m Target depth					
N S P A	MAD/T - AD/V - SPT - 2 SPT - 2 AZ/V - 3 SPT - 2 AZ/V - 2	Wasi Stan Push Auge	er drillin er drillin hbore dard p tube er scre	ng TC bit ng V bit enetration test wing s push tube 1.5		R	stance efusal		⊳ Infl ⊲ Par	ater Samples a ow U - Undisturbed tial Loss D - Disturbed S SPT - Standard P ES - Environmer TW - Thin Wallec LB - Large Distu	I Sample ample enetration Tes ital Sample		E N	ure Condition ) - Dry Λ - Moist V - Wet	<ul> <li>Consistency//Relative Den</li> <li>VS - Very soft</li> <li>S - Soft</li> <li>F - Firm</li> <li>St - Stiff</li> <li>H - Hard</li> <li>VL - Very stiff</li> <li>H - Hard</li> <li>VL - Very losse</li> <li>L - Losse</li> <li>MD - Medium dense</li> <li>D - Dense</li> <li>VD - Very dense</li> <li>Ce - Cemented</li> </ul>

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BH31

Pr Ho	lient: rojec ole L ole P	t Na oca	ion:	Refer t	eth E o PS	M353	30-018	R Fi	gure 1	Cor Log	mmenced mpleted: gged By: ecked By				
	rill M ole D			d Mounting:		macc i mm	hio Ge	o 30	5		Surface: tum:		6.40 i .HD		perator: Matrix Drilling
				ing Informat		,				Soil Description		,		0	Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour o particle characteristics of primary component, colour, secondary component additional observations	ents, Voistrice	Consistency / Delative Density		Hand etromete UCS (kPa)	r Structure, Zoning, Origin Additional Observations
				SPT 0.50-0.95 m 6,7,9 N=16 CBR		 45.4	-		СН	TOPSOIL: CLAY: high plasticity, dark bro rootlets CLAY: high plasticity, dark brown	own, 				0.25: INFERRED NATURAL
			ountered	1.00-3.50 m SPT 1.50-1.95 m 5,11,14 N=25		 44.4				Ironstone band observed					
		z	Not Encountered	SPT 3.00-3.45 m 4,8,11 N=19		 43.4	3			Becomes grey	D to M		t		
		lotha	<u>d</u>	SPT 4.50-4.95 m 5,9,11 N=20		42.4	4			CLAY is weakly laminated	te	Moint			Consistency/Polotive Dec
N	D/T - D/V - /B - PT - T - S -	Was Stan Push Auge	er dril er dril hbore dard tube er scr	penetration tes		R	stance efusal		⊳ Infl ⊲ Par	ater Samples and Tesi bow U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetratio mplete Loss ES - Environmental Sam TW - Thin Walled LB - Large Disturbed Sam	e on Test iple	l	Wire Co D - E M - N W - V	ondition Dry Noist Vet	Consistency/Relative Dens VS - Very soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very losse L - Loose MD - Medium dense D - Dense

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BH31

P H	lient: rojec ole L ole F	t Na .oca	tion:	Refer to	o PS	M35	30-018	R Fig	gure 1	A2020 Zone 56	Commen Complete Logged E Checked				/01/2 L	2024 2024	
	rill M ole D			I Mounting:		nacc mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surfa Datum:	ice:	46 A⊦	.40 r ID	n	Or	perator: Matrix Drilling
				ing Informat				Soil Description									Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beha particle characteristics of p component, colour, secondary c additional observation	rimary omponents,	Moisture Condition	Consistency / Relative Density	Pene I 002 002	Hand etrom UCS kPa)	neter	Structure, Zoning, Origin Additional Observations
		z		SPT 6.00-6.45 m 6,9,12 N=21		40.4	- - - 6		СН	CLAY: high plasticity, dark brown	(continued)	D to M	VSt				
						39.4	- 7 -			Hole Terminated at 6.45 m Target depth							
						 38.4	- 8										
						37.4	9										
	D/T - D/V - IB - PT - F - S -	Was Stan Pusł Auge	er drill er drill hbore dard tube er scr	penetration tes		R	stance efusal		⊳ Infl ⊲ Par	ater Samples ar w U - Undisturbed tial Loss D - Disturbed Sa SPT - Standard Pe ES - Environment TW - Thin Walled LB - Large Disturb	Sample mple netration Test al Sample		<b>loistu</b> D M W	re Co - D - N 7 - W	lry loist		Consistency/Relative Den. VS - Very soft S - Soft F - Firm VSt - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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Borehole ID

BH32

Pr Ho	ient: ojec ole L ole P	t Na oca	tion:	Refer to	o PS	M35	30-018	R Fig	gure 1	Comm Comp Logge A2020 Zone 56 Check	eted: d By:		(		1/202 1/202	
	rill M ole D			d Mounting:		macc 5 mm	hio Ge	o 30	5	Inclination: -90° RL Su Bearing: Datum			48.1 AHD		0	perator: Matrix Drilling
				ing Informat		,				Soil Description			/ (11)			Observations
	Penetration		Samples Tests				Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components additional observations	, Moisture	Condition Consistency /	elative	UC (kP	omete S	r Structure, Zoning, Origin Additional Observations
							-		СН	TOPSOIL: CLAY: high plasticity, dark brown rootlets CLAY: high plasticity, dark brown						0.20: INFERRED NATURAL
				SPT 0.50-0.95 m 3,4,6 N=10		 47.1	- - 1			Becomes orange and grey	C					
			Not Encountered	SPT 1.50-1.95 m 3,5,5 N=10		 46.1	- - 2 -			Becomes grey		s	St			
		z	Not EI	SPT 3.00-3.45 m 4,5,11 N=16		45.1	3			Becomes red and brown trace ironstone gravel	D					
		etho:	<b>d</b> er dril	SPT 4.50-4.95 m 5,8,11 N=19 ling TC bit ling V bit	-	netral			₩ D Infla	Becomes grey and brown ater Samples and Tests bw U - Undisturbed Sample			St sture D - M -		dition	Consistency/Relative Den
N	B - PT - - 	Was Stan Pusł Auge	hbore dard tube er scr	e penetration tes	ť	R				D - Disturbed Sample SPT - Standard Penetration T Serversenantal Sample TW - Thin Walled LB - Large Disturbed Sample			M - W -	Moi We	st t	VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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BH32

C	lient:			Mirvac							Comme	ncod·		09	3/01/	/202	24
	lient: rojec		ime <sup>.</sup>		th F	ntern	rise Pr	ecino	xt		Comme				3/01/ 3/01/		
	ole L										Logged			JE			
Н	ole F	Posit	ion:	293067	′.0 n	n E 62	249859	9.0 m	N MG	A2020 Zone 56	Checked	d By:		A	S		
				d Mounting:			hio Ge	o 30	5	Inclination: -90°	RL Surfa	ace:		3.10	m		
Η	ole [	Diam	eter	:	125	5 mm				Bearing:	Datum:		Ał	HD		0	Operator: Matrix Drilling
			Drill	ing Informati	ion					Soil Desci	ription						Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Descriptio SOIL NAME: Plasticity, ber particle characteristics of component, colour, secondary additional observatic	naviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hand etror UCS (kPa	d netei S	er Structure, Zoning, Origin Additional Observations
ł		0	>		œ	(11)	(11)		СН	CLAY: high plasticity, dark brown		20		100	300	500	
		z	Not Encountered			<del>.</del>	-					D to M	VSt				
				SPT 6.00-6.45 m 10,16,23 HB N=39		42.1	6			Gravelly CLAY: high plasticity, g sub-angular up to 20 mm of SIL origin	ey, gravel is ISTONE		н				
							-			Hole Terminated at 6.45 m Target depth							
							-										
						41.1	7-										
						4											
							-										
							-										
							-										
						40.1	8-										
						7											
						39.1	9-										
L						.,											
							1										
							-										
		104				nct					and Tast-	<u> </u>				<u> </u>	Consistency/D-1-time D
A[ W	D/T - D/V - /B - PT - T - S -	Auge Was Stan Pusł Auge	er dril er dril hbore dard n tube er scr	penetration test		R	stance efusal		⊳ Infl ⊲ Par	Samples           ow         U         - Undisturbed           tial Loss         D         - Disturbed S           mplete Loss         SPT - Standard P           TW         - ES         - Environmen           TW         - Thin Walled           LB         - Large Disturbed	d Sample Sample enetration Tes ntal Sample I		loistu D M W		Dry Moist		VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense
																	VD - Very dense

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Borehole ID

BH33

P H	lient: roject ole L ole P	ocat	ion:		eth E o PS	M35	30-018	R Fig	jure 1		Commenced: Completed: Logged By: Checked By:			21/12 21/12 BG AS		
	rill Mo ole D			I Mounting:		nacc 5 mm	hio Ge	o 305	5		RL Surface Datum:	<b>e</b> :	58.′ AHI	10 m )	0	perator: Matrix Drilling
		I	Drill	ing Informat	ion			Soil Description								Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavio particle characteristics of prim component, colour, secondary com additional observations	ur or ein ary tsi ponents, ov	Condition	onsisto	Har enetro UC (kP	meter S a)	- Structure, Zoning, Origin Additional Observations
		z		ES 0.20 m SPT 0.50-0.95 m 4,7,11 N=18		57.1	- - - 1		СІСНСН	TOPSOIL: CLAY trace sand: medium plasticity, dark brown, sand is fine gra rootlets observed CLAY with gravel trace sand: high pla orange red mottled grey, gravel is su up to 2 mm, sand is fine grained CLAY trace sand: high plasticity, pale mottled orange, sand is fine grained	ined, asticity, / p-angular/ yellow	M	VSt			0.15: INFERRED NATURAL
				SPT 1.50-1.95 m 11,9,10 N=19			- - 2 -			SILTSTONE: dark brown to pale brov low strength, highly weathered, medi strength fragments observed						2.20: INFERRED BEDROCK
		z				54.1 55.1				Becomes pale grey and pale brown		i to M				
							-			Hole Terminated at 4.60 m Refusal						
	<b>M</b> D/T - 7 D/V - 7 /B - 1 /B - 1 PT - 1 S - 7	Pusn Auge	r drill r drill bore dard tube r scr	ing TC bit ing V bit penetration tes ewing is push tube 1.	t	R	stance efusal		> Infl ⊲ Par	ater Samples and 7 w U - Undisturbed Sam tial Loss D - Disturbed Sam SPT - Standard Penet ES - Environmental S TW - Thin Walled LB - Large Disturbed	nple le ration Test Sample	M	М	- Dry - Mois - Wet	st	Consistency/Relative Dens VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

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BH34

Engine	er	in	g Log - N	Vor	n Co	ored	Во	reho	le	Project No.:		PSM3	530		
Client:	NI -	-	Mirvac							Commenced		21/12			
Project Hole Lo										Completed: Logged By:		21/12/ BG	202	3	
Hole Po								-		Checked By:		AS			
			I Mounting:			hio Ge	o 30	5		RL Surface:	60.8				
Hole Dia	ame	eter		125	5 mm				Bearing:	Datum:	AHD	)	0	perator: Matrix Drilling	
_,,	D	)rilli	ing Informat	ion					Soil Description	on				Observations	
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behavio particle characteristics of prima component, colour, secondary comp additional observations	ary [∄;≝	Consistency / Relative Density	Hand enetror UCS (kPa	neter S )	Structure, Zoning, Origin, Additional Observations	
			SPT 0.50-0.95 m 2.2,4 N=6		- 59.8	- - 1		СІ-СН	TOPSOIL: CLAY trace gravel and sa medium to high plasticity, dark brown and brown, sand is fine grained, grav sub-angular up to 3 mm CLAY trace sand: high plasticity, pale mottled red, sand is fine grained, iron	n to red vel is /  e grey	F			0.20: INFERRED NATURAL	
	Z		SPT 1.50-1.95 m 3.4,7 N=11			- - 2 -				м	St				
			SPT 3.00-3.45 m 4,7,9 N=16		57.8	3-									
			SPT 4.00-4.45 m 6,6,9 N=15		- 56.8	4					VSt				
AD/T - A AD/V - A WB - W SPT - S PT - P AS - A	uger Vash tand ush uger	drill drill bore ard tube	penetration tes	t	netrat o resis Re ng 76r	stance efusal		⊳ Inflo ⊲ Par	ater Samples and T ow U - Undisturbed Sam tial Loss D - Disturbed Sam SPT - Standard Penetu ES - Environmental S TW - Thin Walled LB - Large Disturbed	mple ble ration Test Sample	M	- Dry - Moist - Wet		Consistency/Relative Den: VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose	
.ogged in acco	ordance	e with	AS 1726:2017 Geote	echnical	l site inve	estigations								MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact	

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BH34

Client:MirvacProject Name:Elizabeth Enterprise PHole Location:Refer to PSM3530-018Hole Position:293511.0 m E 624961							30-018	R Fig	gure 1	Complet Logged I	Commenced: Completed: Logged By: Checked By:			I/12/ I/12/ G S			
	rill M ole D			d Mounting:		naccl i mm	hio Ge	o 30	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	60 Al	).80 -D	m	0	Operator: Matrix Drilling
				ing Informati		,				Soil Descr							Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of f component, colour, secondary o additional observation	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hand etror UCS (kPa	d nete	er Structure, Zoning, Origin Additional Observations
		z	Not Encountered			8	-		СН	CLAY trace sand: high plasticity, mottled red, sand is fine grained, <i>(continued)</i>	pale grey ironstained	м	VSt				
				SPT 6.00-6.45 m 5,10,20 N=30		54.	6		СН	CLAY: high plasticity, pale grey n ironstained	nottled red,		н				
						53.8				Hole Terminated at 6.50 m Target depth							
						- 52.8	- 8										
						51.8	9										
	           D/T - D/V - /B - PT - T - S -	Was Stan Push Auge	er dril er dril hbore dard tube er scr	ling TC bit ling V bit e penetration test ewing us push tube 1.5	Z	R	stance efusal		⊳ Infle ⊲ Par	ater Samples a bw U - Undisturbed tial Loss D - Disturbed S SPT - Standard Pr ES - Environmen TW - Thin Walled LB - Large Distur	Sample ample enetration Test tal Sample	<u>л</u>	<b>foistu</b> D M W	re C - 1 - 1	Dry Moist	ition	<ul> <li>Consistency/Relative Den</li> <li>VS - Very soft</li> <li>S - Soft</li> <li>F - Firm</li> <li>St - Stiff</li> <li>VSt - Very stiff</li> <li>H - Hard</li> <li>VL - Very loose</li> <li>L - Loose</li> <li>MD - Medium dense</li> <li>D - Dense</li> <li>VD - Very dense</li> <li>Ce - Cemented</li> <li>C - Compact</li> </ul>

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BH35

Client:MirvacProject Name:Elizabeth Enterprise PrecHole Location:Refer to PSM3530-018RHole Position:293031.0 m E 6249559.0						30-018	R Fig	gure 1	A2020 Zone 56	Commend Complete Logged B Checked	d: y:					
Drill M Hole D			d Mounting:		naccl i mm	nio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfac	e:	63. AH	.00 r ID		Op	erator: Matrix Drilling
		Drill	ing Informat						Soil Descrip							Observations
Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behav particle characteristics of prin component, colour, secondary con additional observations	our or nary nponents,	Moisture Condition	onsist elativ€	Pene l	Hand etrome JCS kPa)		Structure, Zoning, Origin, Additional Observations
			SPT 0.50-0.95 m 4,5,5 N=10		62.0	- - - 1		СН	TOPSOIL: CLAY: high plasticity, da rootlets CLAY: high plasticity, red and brow Becomes grey and red							0.20: INFERRED NATURAL
		Not Encountered	SPT 1.50-1.95 m 3.4.4 N=8		61.0						D	F to St				
	z	Not Enc	SPT 3.00-3.45 m 5,7,9 N=16		60.0	3				_						
						4-					D to M	VSt				
			SPT 4.50-4.76 m 39,55/110mm HB N=R			-						н				
AD/T - / AD/V - / WB - SPT - S	Was Stan Push Auge	er dril er dril hbore dard tube er scr	penetration test		netrat o resis Re ng 76r	etance efusal		⊳ Inflo ⊲ Par	ater Samples and SW U - Undisturbed S tial Loss D - Disturbed San SPT - Standard Pen- mplete Loss Environmenta TW - Thin Walled LB - Large Disturber	ample ple etration Test Sample	М	loistur D M W	re Co - D - M - W	ry loist	on	Consistency/Relative Dens VS - Very soft S - Soft F - Firm VSt - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense

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BH35

Client: Mirvac Project Name: Elizabeth Enterprise Precinct													08/01/2024 08/01/2024				
Hole Location: Refer to PSM3530-018R Figure							30-018	R Fig	gure 1		Logged	By:		JE	3L	202	
Hole Position: 293031.0 m E 6249559.0 m N MGA2020 Zone 56								Checke	-		AS						
			el ano neter	d Mounting:		nacc i mm	hio Ge	o 305	5	Inclination: -90° Bearing:	RL Surfa Datum:	ace:	63 AH	.00 HD	m	0	perator: Matrix Drilling
				ing Informat						Soil Descr							Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, beh particle characteristics of component, colour, secondary additional observatio	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Pen	Hand etron UCS (kPa	d nete	r Structure, Zoning, Origi Additional Observation
		 	Not Encountered	SPT 6.00-6.45 m 9,17,20 N=37		57.0	(iii)   6		СН	CLAY: high plasticity, red and bro (continued) Becomes brown and grey		D to M	н	100	200	400	
						56.0	7			Hole Terminated at 6.45 m Target depth							
							8										
						54.0	9										
	D/T - D/V - 'B - PT - T - S -	Aug Wa Star Pus Aug	er dri er dri shbor ndard h tub er sc	penetration test		R	stance efusal		⊳ Infl ⊲ Par	Arean Samples a fater Samples a ow U - Undisturbed D - Disturbed S SPT - Standard Po mplete Loss ES - Environmer TW - Thin Walled LB - Large Distu	l Sample ample enetration Tes ital Sample		l Ioistu D M W		Dry Moist		Consistency/Relative Der VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense

M Pells Sullivan Meynink



JOB no.:

PROJECT:

PSM3530

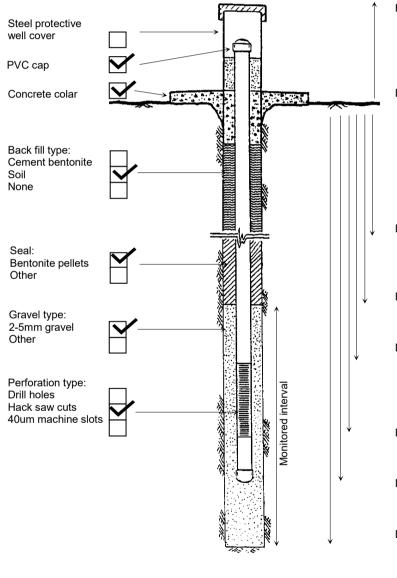
EEP

### PIEZOMETER CONSTRUCTION RECORD

HOLE NUMBER: PIEZOMETER: COLLAR EASTING:	BH02 293044	DRILLING CONTRACTOR: RIG: DEPTH OF HOLE (m):	Matrix Drilling Commachio 205 9.10
COLLAR EASTING: COLLAR NORTHING: COLLAR RL(m):	293044 6249663 62.82	BOREHOLE INCLINATION: PIEZO INSTALLATION DATE:	-90 11/12/2023
DATUM:	GDA2020/ Zone 56	SUPERVISED BY:	JBL

Tick boxes

#### Complete dimensions if appropriate



Height of stickup (m)	0.5
Diameter of PVC (mm)	50
Depth to top of seal	2
Depth to top of gravel pack	2.5
Depth to top of screen	2.7
Depth to base of screen	5.7
Depth to base of piezo	8.7
Depth to base of gravel	8.7

# COMMENTS: HOBO data reader set 8.2

M Pells Sullivan Meynink

Engineering Consultants Rock - Soil - Water

S

JOB no.:

PROJECT:

PSM3530

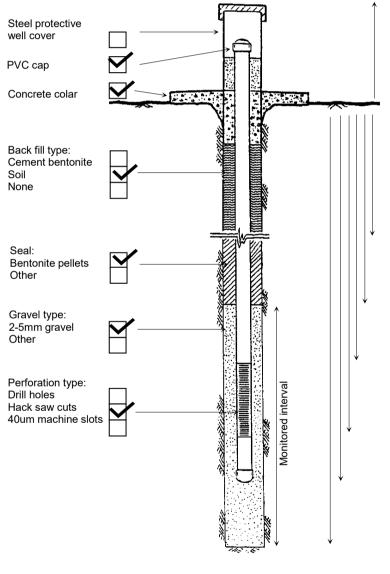
EEP

### PIEZOMETER CONSTRUCTION RECORD

HOLE NUMBER:	BH06	DRILLING CONTRACTOR:	Matrix Drilling
PIEZOMETER:		RIG:	Commachio 205
COLLAR EASTING:	293077	DEPTH OF HOLE (m):	10.70
COLLAR NORTHING:	6250847	BOREHOLE INCLINATION:	-90
COLLAR RL(m):	51.13	PIEZO INSTALLATION DATE:	13/12/2023
DATUM:	GDA2020/ Zone 56	SUPERVISED BY:	JBL

Tick boxes

#### Complete dimensions if appropriate



Height of stickup (m)	0.4
Diameter of PVC (mm)	50_
Depth to top of seal	1
Depth to top of gravel pack	1.5_
Depth to top of screen	1.7
Depth to base of screen	4.7
Depth to base of piezo	10.7
Depth to base of gravel	10.7

# COMMENTS: HOBO data reader set at 10.2m

Appendix C Geotechnical Laboratory Test Certificates (CBR)



 115 Wicks Road

 Macquarie Park, NSW 2113

 Telephone:
 02 9888 5000

 Facsimile:
 02 9888 5001



#### FOUR DAY SOAKED CALIFORNIA BEARING RATIO TEST REPORT

Client:	PSM Admin Pty Ltd	Report No.:	L4970 - 1
PSM Job N	Io.: PSM3530	Report Date:	9/01/2024
		Page 1 of 1	

BOREHOLE NUMBER	BH 4	BH 8	BH 21	BH 33
DEPTH (m)	3.00 - 4.00	0.50 - 1.00	1.50 - 2.50	1.00 - 3.50
Surcharge (kg)	4.5	4.5	4.5	4.5
Maximum Dry Density (t/m <sup>3</sup> )	1.82 STD	1.74 STD	1.88 STD	1.75 STD
Optimum Moisture Content (%)	13.3	17.5	14.6	17.5
Moulded Dry Density (t/m <sup>3</sup> )	1.78	1.70	1.84	1.71
Sample Density Ratio (%)	98	98	98	98
Sample Moisture Ratio (%)	104	102	104	101
Moisture Contents				
Insitu (%)	12.7	17.3	16.1	16.6
Moulded (%)	13.8	17.8	15.2	17.6
After soaking and				
After Test, Top 30mm(%)	28.7	27.6	28.0	30.8
Remaining Depth (%)	19.5	21.5	20.7	23.9
Material Retained on 19mm Sieve (%)	0	0	0	0
Swell (%)	5.0	2.5	4.0	5.0
C.B.R. value: @2.5mm penetration	1.5	2.5	1.0	1.5

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

• 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: 22/12/2023.



NATA Accredited Laboratory 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.

Z 09/01/2024

Authorised Signature / Date (D. Treweek) Appendix D Salinity and Aggressivity Investigation





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Our Ref: PSM3530-020L Rev 3

3 March 2025

Development Manager Mirvac Industrial Developments Level 28, 200 George Street SYDNEY NSW 200 meighan.woods@mirvac.com

Attention: Meighan Wood

Dear Meighan

#### RE: 1669-1723 ELIZABETH DRIVE, BADGERYS CREEK ELIZABETH ENTERPRISE PRECINCT (EEP) STAGE 1 AND 2 SALINITY AND AGGRESSIVITY ANALYSIS

#### 1. Introduction

This letter presents the results and advice for the salinity and aggressivity investigation undertaken by Pells Sullivan Meynink (PSM) at 1669-1723 Elizabeth Drive, Badgerys Creek.

This letter has been updated following the revision of the Masterplan.

#### 2. Fieldwork

The fieldwork was undertaken from 11 December 2023 to 08 January 2024 under the fulltime supervision of a PSM geotechnical engineer, who completed the following tasks underlined in PSM3530-018R dated 8 February 2024.

A total of ten (10) disturbed soil samples were collected by a PSM Geotechnical Engineer for testing in an environmental laboratory.

#### 3. Laboratory Results

The disturbed soil samples were sent to a NATA accredited environmental laboratory and the following tests were undertaken:

- Cation Exchange Capacity (CEC) of calcium, magnesium, potassium and sodium
- Exchange sodium percentage
- Salinity (EC 1:5, one part soil to five parts water)
- Soil pH
- Chlorides
- Sulphates.
- Resistivity.

Table 1 presents a summary of the results. The laboratory reports are presented in Appendix A.

### Table 1 – Laboratory Testing Results

SAMPLE		Electrical Conductivity		Moisture Content	Chloride by discrete	by Sulfate by		Exchangeable Cations [meq/100g]				
ID	рН	[µS/cm]	[ohm.cm]	[%]	analyser [mg/kg]	nalyser	Са	Mg	к	Na	CEC	ESP [%]
BH01 3.0m	8.7	607	1650	11.2	1000	220	0.6	5.1	<0.2	2.1	8	26.4
BH03 6.0m	5.7	736	1360	11.1	1440	120	<0.1	1.4	<0.1	0.6	2.2	28.8
BH08 1.5m	5.8	79	12600	14.1	30	90	1.5	7.2	0.3	1.2	10.1	11.7
BH13 0.5m	7.3	440	2270	7.4	330	100	1.8	3.2	<0.2	1.6	6.6	25
BH13 1.5m	5.2	392	2550	11.4	450	100	6.2	5.9	0.2	1	13.3	7.4
BH27 1.5m	8	254	3940	19	280	170	<0.2	2.8	<0.2	3	5.8	51.7
BH22 1.5m	9.2	495	2020	5.6	300	300	<0.2	2	<0.2	1.8	3.8	48
BH30 1.0m	5.4	467	2140	11.7	700	140	0.2	1.8	<0.1	0.4	2.5	18
BH10 1.5m	8.6	618	1620	10.4	430	420	0.6	4.7	<0.2	3	8.3	35.7
BH15 0.95m	5.5	103	9710	13.2	110	30	<0.1	5.2	0.1	1.2	6.7	18.5

#### 4. Site Conditions

#### 4.1 Soil chemistry

The salinity test results, summarised in Table 1 indicate the following:

- pH of the soil samples analysed was in the range of 5.2 to 9.2, with an average of 6.9
- The 1:5 soil to water extraction and subsequent electrical conductivity (EC1:5) of the soil samples analysed to be in the range of 79 μS/cm to 736 μS/cm
- Concentrations of chlorides in samples analysed was in the range of 30 mg/kg to 1440 mg/kg
- Concentrations of soluble sulphate in samples analysed was in the range of 30 mg/kg to 420 mg/kg
- Cation Exchange Capacity (CEC) in samples analysed was in the range 2.2 meq/100g to 13.3 meq/100g
- Exchange Sodium Percentage (ESP) in samples analysed was in the range of 7.4% to 51.7%.

#### 4.2 Groundwater

Groundwater was not encountered in any of the test locations during sampling.

#### 5. Salinity Assessment

#### 5.1 Salinity

Site Investigations for Urban Salinity (DLWC 2002) classify soil salinity based on electrical conductivity (EC<sub>e</sub>). The method of conversion from EC<sub>1:5</sub> to EC<sub>e</sub> (electrical conductivity of saturated extract) is based on DLWC (2002) and given by EC<sub>e</sub> = EC<sub>1:5</sub> x M, where M is the multiplication factor based on "Soil Texture Group".

The "Soil Texture Group" of the samples tested were assessed during our investigation. The salinity classification for the soil samples that were tested are presented in Table 2.

	Sample ID Sampled		EC1:5 Soil Type		ECe	
Depth (m)		dS/m	Soli Type	M	(dS/m)	Salinity Class
BH01	3.0m	0.607	Heavy Clay	6	3.642	Slightly Saline
BH03	6.0m	0.736	Heavy Clay	6	4.416	Moderately Saline
BH08	1.5m	0.079	Heavy Clay	6	0.474	Non-Saline
BH13	0.5m	0.44	Medium Clay	7	3.08	Slightly Saline
BH13	1.5m	0.392	Heavy Clay	6	2.352	Slightly Saline
BH27	1.5m	0.254	Medium Clay	7	1.778	Non-Saline
BH22	1.5m	0.495	Medium Clay	7	3.465	Slightly Saline
BH30	1.0m	0.467	Heavy Clay	6	2.802	Slightly Saline
BH10	1.5m	0.618	Heavy Clay	6	3.708	Slightly Saline
BH15	0.95m	0.103	Heavy Clay	6	0.618	Non-Saline

#### Table 2 – Salinity Classification

Soils on site are typically classified as "Non-saline" to "Moderately 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 below the limit of "A2" exposure classification (i.e., < 4), except for one sample which is within the "A2" exposure classification.

#### 5.2 Corrosivity

Table 4.8.1 of AS3600-2018 "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 between "A1" and "A2".

Table 6.4.2(C) of Australian Standard AS2159:2009, Piling – Design and Installation provides criteria for exposure classification for concrete piles based on sulphates in the soil and groundwater, soil and groundwater pH, and chlorides in groundwater. On the basis of the soil sulphates and pH testing completed we assess the exposure classification for concrete piles in the soil to be non-aggressive to mild.

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 soil chlorides, resistivity and pH testing completed we assess the exposure classification for steel piles in the soil to be non-aggressive to mild.

#### 5.3 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 7.4 % to 51.7 %, indicates that the soils on site vary from sodic to highly sodic when compared to criteria listed in "Site Investigations for Urban Salinity", DLWC (2002).

#### 5.4 Salinity Management Plan

We have prepared a salinity management plan for the development, which is attached as Appendix B.

Should you have further queries, please do not hesitate to contact the undersigned.

**Yours Sincerely** 

felin

KELVIN LIM ASSOCIATE GEOTECHNICAL ENGINEER

Enc.

Appendix A Laboratory Test Results

Appendix B Salinity Management Plan

AGUSTRIA SALIM PRINCIPAL

## References

- 1. AS2159:2009, Piling Design and Installation, Standards Australia
- 2. AS3600:2009, Concrete Structures, Standards Australia
- 3. Department of Land and Water Conservation (DLWC) 2002, Site Investigations for Urban Salinity

Appendix A Laboratory Test Results



### **CERTIFICATE OF ANALYSIS**

Work Order	ES2343781	Page	: 1 of 4
Client	: PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD	Laboratory	Environmental Division Sydney
Contact	: JEFF LEE	Contact	: Customer Services ES
Address	: G3, 56 DELHI ROAD	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	NORTH RYDE NSW, AUSTRALIA 2113		
Telephone		Telephone	: +61-2-8784 8555
Project	: PSM3530	Date Samples Received	: 15-Dec-2023 12:50
Order number		Date Analysis Commenced	: 19-Dec-2023
C-O-C number	:	Issue Date	: 22-Dec-2023 17:09
Sampler	: JEFF LEE		NATA
Site	:		
Quote number	: EN/333		Accreditation No. 825
No. of samples received	: 4		Accredited for compliance with
No. of samples analysed	: 3		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
Wisam Marassa	Inorganics Coordinator	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

ø = 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+).
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

# Page : 3 of 4 Work Order : ES2343781 Client : PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD Project : PSM3530



#### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01 3.0m	BH03 6.0m	BH08 1.5m		
	Sampling date / time				14-Dec-2023 00:00	14-Dec-2023 00:00		
Compound	CAS Number	LOR	Unit	ES2343781-001	ES2343781-002	ES2343781-003		
				Result	Result	Result		
EA002: pH 1:5 (Soils)								
pH Value		0.1	pH Unit	8.7	5.7	5.8		
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C		1	µS/cm	607	736	79		
EA014 Total Soluble Salts								·
Total Soluble Salts		5	mg/kg	2060	2500	267		
EA055: Moisture Content (Dried @ 1	05-110°C)							
Moisture Content		1.0	%	11.2	11.1	14.1		
EA080: Resistivity								
Resistivity at 25°C		1	ohm cm	1650	1360	12600		
ED006: Exchangeable Cations on Al	kaline Soils							
ø Exchangeable Calcium		0.2	meq/100g	0.6				
ø Exchangeable Magnesium		0.2	meq/100g	5.1				
ø Exchangeable Potassium		0.2	meq/100g	<0.2				
ø Exchangeable Sodium		0.2	meq/100g	2.1				
ø Cation Exchange Capacity		0.2	meq/100g	8.0				
ø Exchangeable Sodium Percent		0.2	%	26.4				
ED007: Exchangeable Cations								·
Exchangeable Calcium		0.1	meq/100g			1.5		
Exchangeable Magnesium		0.1	meq/100g			7.2		
Exchangeable Potassium		0.1	meq/100g			0.3		
Exchangeable Sodium		0.1	meq/100g			1.2		
Cation Exchange Capacity		0.1	meq/100g			10.1		
Exchangeable Sodium Percent		0.1	%			11.7		
ED008: Exchangeable Cations							·	
Exchangeable Calcium		0.1	meq/100g		<0.1			
Exchangeable Magnesium		0.1	meq/100g		1.4			
Exchangeable Potassium		0.1	meq/100g		<0.1			

# Page : 4 of 4 Work Order : ES2343781 Client : PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD Project : PSM3530



#### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01 3.0m	BH03 6.0m	BH08 1.5m	 
		Sampli	ng date / time	14-Dec-2023 00:00	14-Dec-2023 00:00	14-Dec-2023 00:00	 
Compound	CAS Number	LOR	Unit	ES2343781-001	ES2343781-002	ES2343781-003	 
				Result	Result	Result	 
ED008: Exchangeable Cations - Continued							
Exchangeable Sodium		0.1	meq/100g		0.6		 
Cation Exchange Capacity		0.1	meq/100g		2.2		 
Exchangeable Sodium Percent		0.1	%		28.8		 
ED040S : Soluble Sulfate by ICPAES							
Sulfate as SO4 2-	14808-79-8	10	mg/kg	220	120	90	 
ED045G: Chloride by Discrete Analyser							
Chloride	16887-00-6	10	mg/kg	1000	1440	30	 



#### **CERTIFICATE OF ANALYSIS** Page Work Order : ES2344547 : 1 of 5 Amendment :1 Client Laboratory : PELLS SULLIVAN MEYNINK T/A PSM Admin PTY LTD : Environmental Division Sydney Contact : JEFF LEE Contact : Customer Services ES Address Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 : G3, 56 DELHI ROAD NORTH RYDE NSW, AUSTRALIA 2113 Telephone Telephone : +61-2-8784 8555 : -----Project : PSM3530 **Date Samples Received** : 21-Dec-2023 15:50 Order number Date Analysis Commenced : -----: 22-Dec-2023 C-O-C number Issue Date : -----: 30-Jan-2024 15:19 Sampler : JUNG-BIN LEE Site -----



"uhiliw

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:

: EN/333

: 7

: 7

- 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

Quote number

No. of samples received

No. of samples analysed

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
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA032 (Saturated Paste EC): NATA accreditation does not cover the performance of this service.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- Amendment (24/01/2024): This report has been amended and re-released to allow the reporting of additional analytical data, specifically method EA080 for samples ES2344547001-007.
- 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+).
- ALS is not NATA accredited for the calculation of saturated resistivity in a soil.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



#### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH13 0.5m	BH13 1.5m	BH27 1.5m	BH22 1.5m	BH30 1.0m
		Samplir	ng date / time	18-Dec-2023 00:00	18-Dec-2023 00:00	20-Dec-2023 00:00	19-Dec-2023 00:00	21-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	ES2344547-001	ES2344547-002	ES2344547-003	ES2344547-004	ES2344547-005
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value		0.1	pH Unit	7.3	5.2	8.0	9.2	5.4
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C		1	µS/cm	440	392	254	495	467
EA055: Moisture Content (Dried @ 10	)5-110°C)							
Moisture Content		1.0	%	7.4	11.4	19.0	5.6	11.7
EA080: Resistivity								
Resistivity at 25°C		1	ohm cm	2270	2550	3940	2020	2140
EA084: Saturated Resistivity								
Resistivity at 25°C		10	ohm cm	880	640	610	470	680
ED006: Exchangeable Cations on Alk	aline Soils							
ø Exchangeable Calcium		0.2	meq/100g	1.8		<0.2	<0.2	
ø Exchangeable Magnesium		0.2	meq/100g	3.2		2.8	2.0	
ø Exchangeable Potassium		0.2	meq/100g	<0.2		<0.2	<0.2	
ø Exchangeable Sodium		0.2	meq/100g	1.6		3.0	1.8	
ø Cation Exchange Capacity		0.2	meq/100g	6.6		5.8	3.8	
ø Exchangeable Sodium Percent		0.2	%	25.0		51.7	48.0	
ED008: Exchangeable Cations								·
Exchangeable Calcium		0.1	meq/100g		6.2			0.2
Exchangeable Magnesium		0.1	meq/100g		5.9			1.8
Exchangeable Potassium		0.1	meq/100g		0.2			<0.1
Exchangeable Sodium		0.1	meq/100g		1.0			0.4
Cation Exchange Capacity		0.1	meq/100g		13.3			2.5
Exchangeable Sodium Percent		0.1	%		7.4			18.0
ED040S : Soluble Sulfate by ICPAES						·	·	·
Sulfate as SO4 2-	14808-79-8	10	mg/kg	100	100	170	300	140
ED045G: Chloride by Discrete Analys	ser					·	·	·
Chloride	16887-00-6	10	mg/kg	330	450	280	300	700



#### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)					BH15 0.95m		 
Sampling date / time				18-Dec-2023 00:00	18-Dec-2023 00:00		 
Compound	CAS Number	LOR	Unit	ES2344547-006	ES2344547-007		 
				Result	Result		 
EA002: pH 1:5 (Soils)					· · · · · · · · · · · · · · · · · · ·		
pH Value		0.1	pH Unit	8.6	5.5		 
EA010: Conductivity (1:5)							
Electrical Conductivity @ 25°C		1	µS/cm	618	103		 
EA055: Moisture Content (Dried @ 1	05-110°C)						
Moisture Content		1.0	%	10.4	13.2		 
EA080: Resistivity							 ·
Resistivity at 25°C		1	ohm cm	1620	9710		 
EA084: Saturated Resistivity							
Resistivity at 25°C		10	ohm cm	520	2240		 
ED006: Exchangeable Cations on Al	kaline Soils						
ø Exchangeable Calcium		0.2	meq/100g	0.6			 
ø Exchangeable Magnesium		0.2	meq/100g	4.7			 
ø Exchangeable Potassium		0.2	meq/100g	<0.2			 
ø Exchangeable Sodium		0.2	meq/100g	3.0			 
ø Cation Exchange Capacity		0.2	meq/100g	8.3			 
ø Exchangeable Sodium Percent		0.2	%	35.7			 
ED007: Exchangeable Cations			•				
Exchangeable Calcium		0.1	meq/100g		<0.1		 
Exchangeable Magnesium		0.1	meq/100g		5.2		 
Exchangeable Potassium		0.1	meq/100g		0.1		 
Exchangeable Sodium		0.1	meq/100g		1.2		 
Cation Exchange Capacity		0.1	meq/100g		6.7		 
Exchangeable Sodium Percent		0.1	%		18.5		 
ED040S : Soluble Sulfate by ICPAES							 ·
Sulfate as SO4 2-	14808-79-8	10	mg/kg	420	30		 
ED045G: Chloride by Discrete Analy	ser					·	· 
Chloride	16887-00-6	10	mg/kg	430	110		 



Appendix B Salinity Management Plan



G3 56 Delhi Road North Ryde NSW 2113 P +61-2 9812 5000 E mailbox@psm.com.au

www.psm.com.au

#### Our Ref: PSM3530-011L REV4

3 March 2025

Mirvac Industrial Developments Level 28, 200 George Street Sydney NSW 2000 Meighan.woods@mirvac.com

Attention: Meighan Woods

Dear Meighan

#### RE: 1669-1723 ELIZABETH DRIVE, BADGERYS CREEK ELIZABETH ENTERPRISE PRECINCT (EEP) STAGE 1 & 2 SALINITY MANAGEMENT PLAN

#### 1. Introduction

This letter presents salinity management advice for the proposed warehouse development located at 1669-1723 Elizabeth Drive, Badgerys Creek NSW (the Site). This work has been undertaken in accordance with our email proposal dated 24 May 2021 and updated in accordance with our proposal PSM3530-013L dated 11 August 2023.

The salinity management advice has been updated to reflect additional results obtained from the Stage 2 geotechnical investigation undertaken in accordance with PSM3530-013L.

#### 1.1 Development Overview

The site is located within the suburb of Badgerys Creek, within the Liverpool LGA. Currently, the site is vacant with a single storey structure and some ponds located within the site. The proposed development across the Site comprises multiple warehouse facilities with external hardstand areas, on-grade carparks and office blocks.

#### 2. Objective

The objective of this salinity management plan (SMP) is to effectively manage site salinity, to minimise the effect of the proposed development on the salinity processes and to protect the proposed development from salinity damage. All works are to conform with the Western Sydney Salinity Code of Practice June 2003.

#### 3. Salinity Assessment

We have previously undertaken a salinity investigation within the Stage 1 portion of the Site in 2018 (ref: PSM3530-005L REV2, dated 7 July 2021), which included salinity and aggressivity testing.

It is assessed that the assessed soils within Stage 1 are classified as "non-saline" to "moderately saline", including:

- Nine (9) samples in "non-saline"
- Four (4) samples in "slightly saline"

• Two (2) samples in "moderately saline".

Additional salinity testing was undertaken within Stage 2 of the Site during the geotechnical investigation between 11 December 2023 and 8 January 2024 (ref. PSM3530-018R dated 8 February 2024).

Assessment of the soils within Stage 2 are classified as "non-saline" to "moderately saline", including:

- Three (3) samples in "non-saline"
- Six (6) samples in "slightly saline"
- One (1) sample in "moderately saline."

#### 4. Construction Salinity Management Strategies – Mitigation Measures

#### 4.1 Development Components

This SMP addresses the components of the proposed development for both stages (i.e., Stage 1 and 2) during the construction stage for the permanent works. Salinity management regarding the following development components are provided in the following sections:

- Earthworks
- Imported soils
- Gardens and landscaped areas
- Roads, footpaths and hardstand areas
- Surface water, stormwater and drainage
- Durability of concrete structures in contact with the ground
- Durability of steel structures in contact with the ground.

#### 4.2 Earthworks

The Site is expected to undergo cut and fill works to construct the pads to their final design levels. Based on the provided masterplans, we anticipate:

- Cut: Maximum of 8 to 9 m at the western boundary adjacent to Elizabeth Drive, with retaining walls to be constructed
- Fill: Maximum of 6 to 7 m at various locations.

Design and construction of the earthworks should consider the following strategies and recommendations:

- Importation of soil as per Section 4.3 of this letter
- Vegetation cover should be estimated and maintained on permanent batters upon completion to control erosion
- The final surface of all areas of the development should be graded to prevent the ponding of surface water
- Erosion control of temporary batters, stockpiles and disturbed areas should be planned prior to undertaking the earthworks and implemented during the earthworks. Consideration should be given to:
  - Grading and sealing partially completed surfaces
  - Installation of clearly visible fencing and traffic control measures to prevent unnecessary trafficking of areas and ensuring site disturbance
  - Establishing set vehicular access points and roads
  - Protecting stockpiles (temporary vegetation or mulching) where these are to be left in place for long durations.
- Sediment control shall be implemented by means of sediment traps and silt fencing where considered necessary.

- Dust suppression using water carts will avoid over-watering and only use sufficient water to manage dust rise. Surface ponding will be avoided using dust suppression.
- Water used for construction purposes (e.g., to achieve adequate compaction rates) will be applied sparingly.

#### 4.3 Importation of Soil

Materials to be imported to site should be assessed for suitability for the intended use. Very to high saline soils shall not be imported to site.

#### 4.3.1 Salinity Testing

Salinity testing shall be undertaken on imported soil and in accordance with "Site Investigations for Urban Salinity", Department of Land and Water Conservation (2002). Material with Ece > 8 dS/m; i.e., very to high saline shall not be imported.

#### 4.4 Gardens and Landscaped Areas

The proposed development will result in the majority of the site comprising roads, footpaths, and hardstand areas. Garden and landscaped areas are likely to be of limited extent. The design and construction of the gardens and landscaped areas should consider the following recommendations:

- Irrigation of rehabilitated or landscaped areas will utilize low-water-use fixtures such as drippers, subsurface irrigation or similar. Water will be applied sparingly and only in quantities sufficient to promote plant growth. Subsoil moisture will be physically checked (through visual observation) regularly during irrigation to ensure watering rates are not excessive
- Selection of plant species should consider the soil conditions, including moderate salinity, relatively
  poor fertility and clayey low permeability soil profiles. Promotion of successful revegetation is likely
  to require use of nutrient rich topsoil. Saline topsoils should not be imported to site
- Potential for water logging should be minimised by:
  - Adopting plant species with minimal watering requirements
  - Adopting 'waterwise' gardening principles
  - Minimising use of potable water in landscaped areas
  - Properly designed and implemented irrigation systems
  - Establishment of perennial species and deep rooted trees.

#### 4.5 Roads, Footpaths and Hardstand Areas

As stated, the proposed development will result in the majority of the site comprising roads, footpaths, and hardstand areas. The design and construction of roads, footpaths and hardstand areas should consider the following recommendations:

- Roads, footpath and hardstand surfaces should be graded, and the grades maintained at all times to prevent ponding of surface water at locations where this can result in infiltration into the underlying soils (e.g. pavement joints)
- Connections between the roads, footpath and hardstand surfaces and the surface water and stormwater drainage infrastructure should be designed, constructed and maintained to restrict infiltration into underlying soils
- Services that are to be located below the roads, footpath and hardstand surfaces should be installed, where practical, at the time of construction
- Provision for a damp-proof course or membrane beneath slabs should be considered by the slab designer.

#### 4.6 Surface Water, Stormwater and Drainage

Surface water, stormwater and drainage design should aim at restricting infiltration into the ground resulting in groundwater recharge. The design and construction of surface water, stormwater and drainage measures should thus consider the following recommendations:

- Disturbance of natural drainage patterns should be reduced. Where these are disturbed or altered appropriate artificial drainage should be installed
- Stormwater and surface water should be managed to restrict infiltration
- Temporary water retaining structures used during construction should be managed to restrict infiltration
- Stormwater and surface water infrastructure should be designed and constructed to minimise the likelihood of leakage
- Guttering and down pipes should be connected and maintained
- Surface water runoff should be directed around all exposed surfaces, temporary stockpiles and landscaped areas
- Disturbance to the natural hydrological system shall be minimised by maintaining good surface drainage and reducing water logging on the Site
- Groundwater recharge is to be minimised to the extent it does not adversely impact groundwater dependent ecosystems downstream.

#### 4.7 Durability of Concrete Structures in Contact with The Ground

In designing structural concrete elements in contact with the ground the design should consider the results of the salinity assessment and the durability requirements in AS2159:2009 Piling "Design and Installation" and AS3600:2018 "Concrete Structures".

Both these standards provide guidance on minimum concrete grade/strength and minimum cover requirements.

Based on the salinity and aggressivity test results (ref. PSM3530-005L REV2, dated 7 July 2021 and PSM3530-020L, dated 8 February 2024), it is recommended that:

- 1. The design of structural concrete members in contact with the ground (excluding piles) adopt an A2 exposure classification as defined in AS3600:2018.
- 2. The design of concrete cast in situ piles adopt a mild classification as defined in AS2159:2009.

#### 4.8 Durability of Steel Structures in Contact with The Ground

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 soil chlorides, resistivity and pH testing completed we assess the exposure classification for steel piles in the soil to be mild.

#### 5. Conclusion

We recommend the Designer(s) and contractor(s) responsible for the various development components give appropriate consideration to the recommendations in this SMP.

The designer and contractors should contact PSM during the works if they have any queries with regards to the requirements in the SMP or if conditions significantly differ from those described in this SMP.

**Yours Sincerely** 

Jetin

**KELVIN LIM** ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM PRINCIPAL Appendix E Interim Geotechnical Design Advice





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#### Our Ref: PSM3530-003L REV7

3 March 2025

Development Manager Mirvac Industrial Developments Level 28, 200 George Street SYDNEY NSW 2000 meighan.woods@mirvac.com

Attention: Meighan Woods

Dear Meighan

#### RE: 1669-1723 ELIZABETH DRIVE, BADGERYS CREEK ELIZABETH ENTERPRISE PRECINCT (EEP) STAGE 1 AND STAGE 2 INTERIM GEOTECHNICAL DESIGN ADVICE

#### 1. Introduction

This letter provides interim geotechnical design advice (IGDA) for the proposed development at 1669-1723 Elizabeth Drive, Badgerys Creek. This interim advice will be issued as final on completion of the bulk earthworks.

This revised letter has been updated following PSM's additional geotechnical investigation undertaken between 11 December 2023 and 8 January 2024 within the Stage 2 portion of EEP. The IGDA encompasses Stage 1 and Stage 2. Figure 1 presents a staging plan for the Site and Figure 2 presents the masterplan for Stage 1 only (ref.: 20266 MP 02 M dated 19 February 2025).

We are not aware of any performance requirements for the proposed development.

#### 2. Bulk Earthworks

The design advice in the following sections is provided on the basis that:

- The bulk earthworks on site to be completed in accordance with a PSM Specification, currently PSM3530-004S REV5 (the Specification)
- PSM to audit the earthworks to confirm the advice in this letter at the completion of the bulk earthworks.

The Specification allows for a broad range of fill to be incorporated into the earthworks. Fill placed in accordance with the Specification will be well compacted under tight site supervision. The subgrade will be stiff or better.

The Specification complies with the intent of AS 3798-2007 "Guidelines on earthworks for commercial and residential developments" and is intended to specify the minimum requirements to achieve a fill with the properties provided in Section 3 of this letter. The Specification is generally in accordance with AS3798-2007, but for this site it allows Blended Topsoil Fill following grubbing of shrubs and trees.

The Specification requires close inspection, frequent testing and external auditing of the earthworks to provide a high level of confidence that the completed work complies with the Specification. The Specification will only

be varied with the consent of PSM to ensure that this interim design advice is able to be confirmed at the completion of the earthworks.

We have based our assessment of moduli on numerous plate load tests (PLTs) completed on VENM / ENM fills by PSM.

If the structural or civil engineer requires engineering properties different to those provided in Section 3 then the specification can be modified such that these properties will be obtained in the final earthworks. This allows the additional cost of the earthworks to be balanced against any economies achieved in other parts of the works.

#### 3. Design Advice

#### 3.1 All Areas

This section provides interim design advice for all areas where the bulk earthworks has been undertaken in accordance with the Specification. Note, this advice allows for Blended Topsoil Fill. See Section 2.3.2 of the Bulk Earthworks Specs for the definition of Blended Topsoil Fill.

#### 3.2 Site Classification

While the proposed development is out of scope of AS2870-2011 *"Residential slabs and footings"*, we assess that, for the natural site, cut and fill placed in accordance with the Specification, the characteristic surface movement,  $y_s$ , would be in the range 40 mm to 60 mm and thus would classify the site as Class H1. 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.

For effectively sealed areas away from the perimeter, the design should allow for the following:

- Differential mound movement,  $y_m = 20$  mm. We note that this is not the total heave or settlement but the estimated local heave or settlement due to fill variability
- Tilts of up to approximately 1 in 400.

Regular maintenance of the slab/ pavement joints and sealants is required, including dowelled joints, expansion joints and saw-cuts to limit water ingress to the subgrade.

Mounds at perimeters or penetrations of slabs open to the environment can be taken to be as per AS2870-2011 for  $y_s = 55$  mm.

The designer should consider variation of fill depth across any area.

Further the designer should consider the impact of any delay in construction of slabs and pavements following completion of the bulk earthworks.

#### 3.3 Excavation Conditions

Excavation in the TOPSOIL, FILL, NATURAL SOIL, and BEDROCK units is expected to be achievable using conventional earth moving equipment with minor rock breaking.

It is our experience that excavatability is heavily dependent on both the operator and the plant used. Any earthworks contractor should satisfy itself with regard to excavatability especially in the BEDROCK units.

Based on the results of the site investigation and the proposed earthworks, we expect groundwater is unlikely to be encountered during the bulk earthworks. There may be minor groundwater inflows while perched water tables drain initially and after rain.

#### 3.4 **Permanent and Temporary Batters**

The batter slope angles shown in Table 1 are recommended for the design of batters up to 10 m height and above groundwater, subject to the following recommendations:

- 1. The batters shall be protected from erosion.
- 2. Permanent batters shall be drained.
- 3. Temporary batters shall not be left unsupported for more than 2 month without further advice, and inspection by a geotechnical engineer should be undertaken following significant rain events.
- 4. Where loads are imposed or structures/services are located within 1 batter height of the crest of the batter.

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

Where FILL is not engineered / controlled fill, batter slope angles should be assessed by a geotechnical engineer.

Exposed rock faces should be inspected by a geotechnical engineer or engineering geologist to assess the need for localised rock bolting to control adverse jointing in the BEDROCK units and shotcreting for overall face support.

#### Table 1 – Batter Slope Angles

Unit		Temporary	Permanent	
ENGINEERED FILL		1.5H : 1.0V	2.0H : 1.0V	
NATURAL SC	IL	1.5H : 1.0V	2.0H : 1.0V	
BEDROCK UNITS <sup>1</sup>	(for portion of cut less than or equal to 6 m deep)	0.5H : 1.0V	1.0H : 1.0V	
	(for portion of cut greater than 6 m deep)	1.0H : 1.0V	1.5H : 1.0V	

See above requirements regarding inspections.

Steeper batters may be possible subject to further advice, probably including inspection during construction. 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.

#### 3.5 Retaining Walls

Cuts in the ENGINEERED FILL, NATURAL SOIL and BEDROCK units steeper than the recommended permanent batter slopes in Section 3.4 will need to be supported by some form of retaining structure.

The selection of the appropriate retention system is a matter of design. The designer should consider the following factors in making its selection:

- Technical factors:
  - Performance
  - Ground conditions (this is addressed below with the design parameters)
  - Surcharge loading and
  - Proximity of structures, buildings and roads, etc.
- Non- technical factors
  - Cost (to build and to maintain)
  - Other constraints such as real estate, neighbouring site / boundary, aesthetics, legislation, etc.

The design of these structures should be based on the following geotechnical properties:

• Effective soil strength parameters in Table 2, and

• A lateral pressure of 10 kPa for vertical cuts in the BEDROCK units.

This is to allow for blocks and rock wedges formed due to adverse defects that may exist within the unit.

Note that design of retention systems may be based on either  $K_a$  or  $K_o$  earth pressures. Design using active earth pressures provides the minimum lateral earth pressure that must be supported to avoid failure and requires a wall that can rotate or translate to allow the pressures to reduce to these values (vertical and lateral movements up to 2% of height may occur, typical movements will be much less).

Where the design is based on  $K_o$  pressures, construction should be carefully controlled to avoid unwanted effects. It should be noted that designing for  $K_o$  pressures do not, of themselves, ensure that movement does not occur. Movements are controlled by the construction method, especially sequence.

Both surface and sub-surface drainage needs to be designed and constructed properly to prevent pore water pressures from building up behind the retaining walls or appropriate water pressures must be included in the design.

Retaining wall shall be designed in accordance with AS4678-2002, Earth-retaining structures, and/or other appropriate standard as approved by the Principal. The long term permanent global stability of the wall must also be assessed and shall be satisfactory. If the traditional (lumped) FOS approach is adopted, the retaining wall shall be designed for a long term permanent global stability FOS of at least 1.5.

For temporary structures / batters, they can be designed for FOS of at least 1.3.

#### 3.6 Foundations

The following section provides advice and parameters that may be used when proportioning footings.

Where adjacent foundation details differ (e.g., pile and pad, differing loads or ground conditions) differential settlement will need to be assessed.

#### 3.6.1 Shallow Footings

Pad footings can be proportioned on the basis of an allowable bearing pressure (ABP) for centric vertical loads presented in Table 2.

INFERRED	BULK UNIT	SOIL EFFECTIVE STRENGTH PARAMETERS		ULTIMAT E BEARING PRESSUR	ALLOWABL E BEARING PRESSURE UNDER	ULTIMATE SHAFT ADHESION	ELASTIC PARAMETERS	
UNIT	WEIGH T (kN/m³)	c' (kPa)	φ' (deg)	E UNDER VERTICAL CENTRIC LOADING (kPa)	VERTICAL CENTRIC LOADING (kPa)	ULTIMATE SHAFT ADHESION (kPa)	YOUNG's MODULUS (MPa)	POISSON'S RATIO
ENGINEERED FILL	18	0	30	420	150 <sup>1</sup>	N.A.	10	0.3
RESIDUAL SOIL	18	0	30	420	150 <sup>1</sup>	N.A.	10	0.3
BEDROCK A	22	10	30	3000**	700***	50	50	0.25
BEDROCK B	24	30	30	15,000**	2,000***	200	200	0.25

Table 2 – Engineering	<b>Parameters of Inferre</b>	d Geotechnical Units
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<sup>1</sup> Shallow footings (for ABP of 150 kPa) should have a horizontal dimension of 1.0 m; and an embedment depth of 0.5 m.

<sup>2</sup> \*\* - Ultimate values occur at large settlement (>5% of minimum footing dimensions).

<sup>3</sup> \*\*\* - End bearing pressure to cause settlement of <1% of minimum footing dimensions.

Higher ABPs may be available, but these depend on the size, depth, loads, etc. and would be subject to specific advice.

Footing settlement can be assessed based on the subgrade Young's moduli provided in Table 2.

We recommend that PSM inspect a representative sample of the footings during construction, to confirm the advice provided in this letter.

#### 3.6.2 Slabs

The design of the slabs for the warehouse can be based on a subgrade with the Young's moduli in Table 2.

PSM do not recommend designing slab using the "k-values" (Modulus of Subgrade Reaction / spring stiffness) approach, as it is not a soil property. Please note that "k-values" is not an intrinsic soil property, and the values depend on these factors amongst others:

- Soil elastic properties
- Loaded area and load shape
- Stiffness of the slab
- Method of interpretations/ assessments.

Any slab designer who adopts the "modulus of subgrade reaction", k, approach in its design, should understand the limitation of the approach.

Numerous publications and literatures have provided discussion about the limitation of the "k" approach, including Cement Concrete & Aggregates Australia (CCAA) T48 - Guide to Industrial Floors and Pavements – design, construction and specification (Appendix B of the document). We have advised the (long term) Young's Modulus in Table 2.

The design of the slabs on ground should also consider the effects of differential settlement due to varying founding conditions, pattern loading and the shrink swell effects discussed in Section 3.2.

#### 3.7 Pavements

Results of CBR testing indicate a soaked CBR value of between 1.0% and 8.0% (**Ref. PSM3530-002L REV 6 and PSM3530-018R**). We recommend a design CBR value of 2.0% is adopted for pavement design. Particular attention should be paid to preserving the equilibrium moisture content in the subgrade as zones that become saturated may exhibit lower CBR strengths.

Higher values, particularly in areas of significant cut, may be provided on completion of testing on the finished bulk earthworks or if, on request, the Specification is varied to obtain such higher value on fill.

#### 3.8 General

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. Plate load testing during the filling (i.e., as filling work progresses) will be required where blended topsoil has been used.

We understand that the structural engineer should be able to design an efficient slab and shallow footings for these geotechnical conditions. If assessed deformation and settlement is an issue then our advice can be further refined if required.

We note that desiccation and/or wetting up of the pad surface is possible should it be exposed to the elements for an extended period of time, particularly at completion of the bulk earthworks prior to the builder taking responsibility for the pad. To reduce the likelihood of this and preserve the pad condition we recommend the following should be considered following completion of the bulk earthworks:

- Placement of a sacrificial layer comprising roadbase or other equivalent material
- Grade the pad surface to reduce the extent and severity of standing water during and after weather events
- Minimise the time between the completion of earthworks and the builder commencing construction of the warehouse roof

• Limit vehicular and plant access until a roof has been installed.

Alternately, the developer or builder may have to undertake some surficial remediation if the pad is to comply with the requirements of this IGDA (i.e. comply with the PSM Specification) at the time of construction. 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.

Should there be any queries, do not hesitate to contact the undersigned.

**Yours Sincerely** 

felin

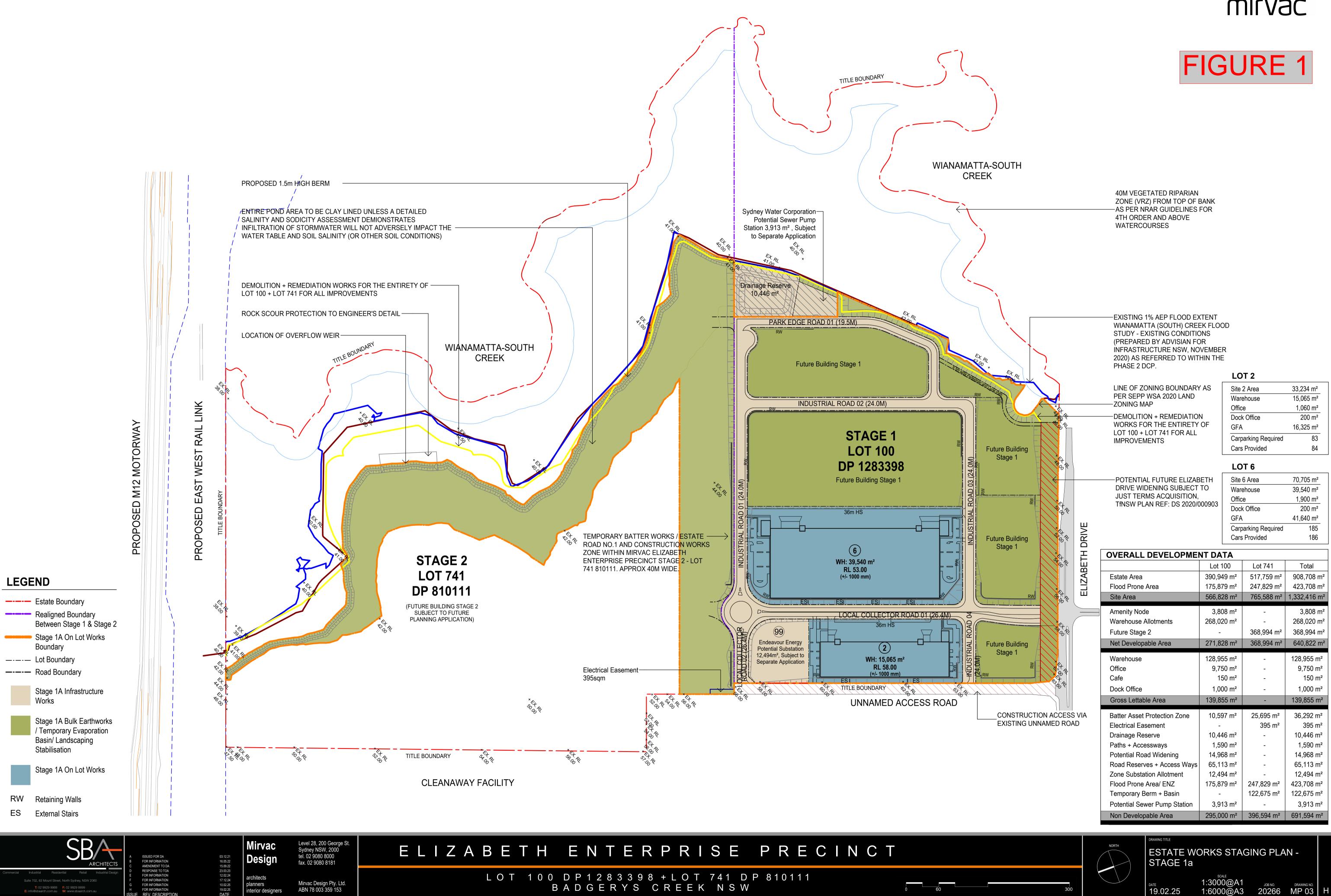
KELVIN LIM ASSOCIATE GEOTECHNICAL ENGINEER

Enc.

Figure 1 Staging plan

Figure 2 SSDA Masterplan – Stage 1

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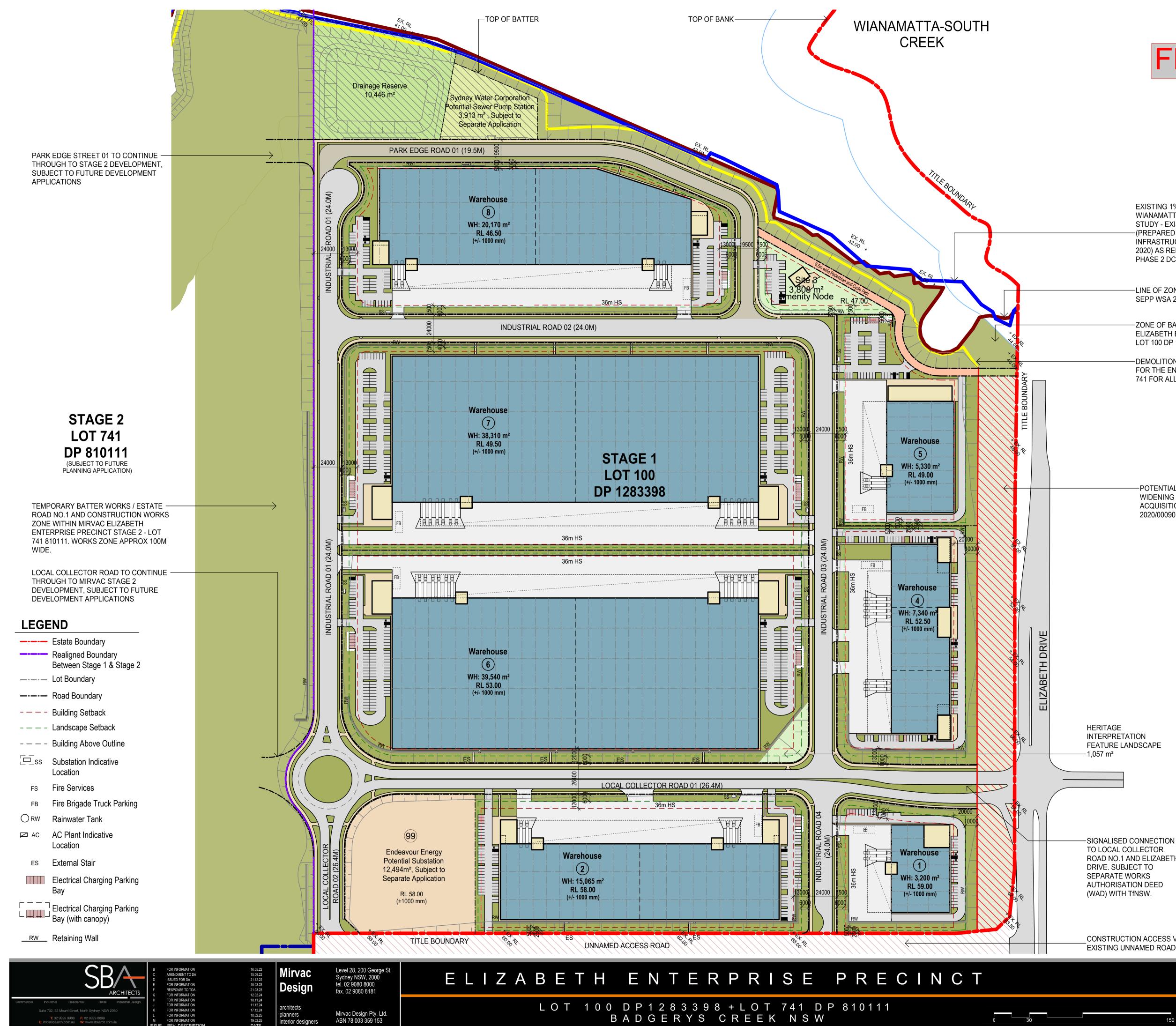
LOT 100 DP1283398 + LOT 741 DP 810111 BADGERYS CREEK NSW

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**REV. DESCRIPTION** 

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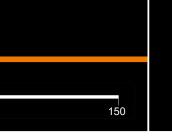


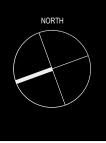
[	LOT DEVELOP	MENT DATA
	Site 1 Area Warehouse Office Dock Office GFA Cars Provided	12,900 m² 3,200 m² 830 m² 100 m² 4,130 m² 35
EXISTING 1% AEP FLOOD EXTENT WIANAMATTA (SOUTH) CREEK FLOOD STUDY - EXISTING CONDITIONS (PREPARED BY ADVISIAN FOR INFRASTRUCTURE NSW, NOVEMBER 2020) AS REFERRED TO WITHIN THE PHASE 2 DCP.	Site 2 Area Warehouse Office Dock Office GFA Cars Provided Cafe (Site 3) Cars Provided	33,234 m <sup>2</sup> 15,065 m <sup>2</sup> 1,060 m <sup>2</sup> 200 m <sup>2</sup> 16,325 m <sup>2</sup> 84 150 m <sup>2</sup> 23
LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP ZONE OF BATTER WORKS WITHIN MIRVAC	Site 4 Area Warehouse Office GFA	23,907 m <sup>2</sup> 7,340 m <sup>2</sup> 1,650 m <sup>2</sup> 8,990 m <sup>2</sup>
ELIZABETH ENTERPRISE PRECINCT STAGE 1, LOT 100 DP 1283398. DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS	Cars Provided Site 5 Area Warehouse Office Dock Office GFA Cars Provided	69 18,014 m² 5,330 m² 1,410 m² 100 m² 6,840 m² 56
-POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903	Site 6 Area Warehouse Office Dock Office GFA Cars Provided Site 7 Area Warehouse Office Dock Office	70,705 m <sup>2</sup> 39,540 m <sup>2</sup> 1,900 m <sup>2</sup> 200 m <sup>2</sup> 41,640 m <sup>2</sup> 186 69,372 m <sup>2</sup> 38,310 m <sup>2</sup> 1,900 m <sup>2</sup> 200 m <sup>2</sup>
	GFA Cars Provided Site 8 Area Warehouse Office Dock Office GFA Cars Provided	40,410 m <sup>2</sup> 182 39,888 m <sup>2</sup> 20,170 m <sup>2</sup> 1,000 m <sup>2</sup> 200 m <sup>2</sup> 21,370 m <sup>2</sup> 102

OVERALL DEVELOPMENT DATA					
	Stage 1 Lot 100	Stage 2 Lot 741	Total		
Estate Area	390,949 m²	517,759 m <sup>2</sup>	908,708 m²		
Flood Prone Area	175,879 m²	247,829 m²	423,708 m²		
Site Area	566,828 m <sup>2</sup>	765,588 m <sup>2</sup>	1,332,416 m <sup>2</sup>		
Amenity Node	3,808 m²	-	3,808 m²		
Warehouse Allotments	268,020 m²	-	268,020 m²		
Future Stage 2	-	368,994 m²	368,994 m²		
Net Developable Area	271,828 m <sup>2</sup>	368,994 m <sup>2</sup>	640,822 m <sup>2</sup>		
Warehouse	128,955 m²	-	128,955 m²		
Office	9,750 m²	-	9,750 m²		
Cafe	150 m²	-	150 m²		
Dock Office	1,000 m²	-	1,000 m²		
Gross Lettable Area	139,855 m²	-	139,855 m²		
Batter Asset Protection Zone	10,597 m²	25,695 m²	36,292 m²		
Batter Asset Protection Zone Electrical Easement	10,597 m² -	25,695 m² 395 m²	36,292 m² 395 m²		
	10,597 m² - 10,446 m²				
Electrical Easement	-		395 m²		
Electrical Easement Drainage Reserve	- 10,446 m²		395 m² 10,446 m²		
Electrical Easement Drainage Reserve Paths + Accessways	- 10,446 m² 1,590 m²		395 m² 10,446 m² 1,590 m²		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening	- 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m²	395 m² - - - -	395 m² 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m²		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ	- 10,446 m² 1,590 m² 14,968 m² 65,113 m²	395 m² - - - - 247,829 m²	395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup>		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin	- 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m²	395 m² - - - -	395 m² 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m²		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ	- 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m²	395 m <sup>2</sup> - - - 247,829 m <sup>2</sup> 122,675 m <sup>2</sup> -	395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup> 3,913 m <sup>2</sup>		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin	- 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 175,879 m <sup>2</sup> -	395 m² - - - - 247,829 m²	395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup>		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin Potential Sewer Pump Station	- 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 175,879 m <sup>2</sup> - 3,913 m <sup>2</sup>	395 m <sup>2</sup> - - - 247,829 m <sup>2</sup> 122,675 m <sup>2</sup> -	395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup> 3,913 m <sup>2</sup>		
Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin Potential Sewer Pump Station Non Developable Area	- 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 175,879 m <sup>2</sup> - 3,913 m <sup>2</sup> 295,000 m <sup>2</sup>	395 m <sup>2</sup> - - - 247,829 m <sup>2</sup> 122,675 m <sup>2</sup> - 396,594 m <sup>2</sup>	395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup> 3,913 m <sup>2</sup> 691,594 m <sup>2</sup>		

ROAD NO.1 AND ELIZABETH DRIVE. SUBJECT TO SEPARATE WORKS AUTHORISATION DEED (WAD) WITH TfNSW.

CONSTRUCTION ACCESS VIA EXISTING UNNAMED ROAD





## RAWING TITLE SSDA MASTERPLAN - STAGE 1

<sup>DATE</sup> 19.02.25

1:1500@A1 1:3000@A3

Appendix F Bulk Earthwork Specification



# 1669-1723 ELIZABETH DRIVE, BADGERYS CREEK ELIZABETH ENTERPRISE PRECINCT (EEP) STAGE 1 & 2 EEP BULK EARTHWORK SPECIFICATION

FILLING, CUTTING AND TESTING (WITH BLENDED TOPSOIL)

PSM3530-004S REV 8 3 March 2025



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## **List of Appendices**

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# 1. Scope

This specification details the requirements for the bulk earthworks to be undertaken at 1669-1723 Elizabeth Drive, Badgerys Creek. The area where this specification is applicable is shown in Attachment 1.

This revised specification has been updated to incorporate the updated master plan for Stage 1.

Fill placed in accordance with this specification is denoted as Engineered Fill.

This specification does not address any environmental, contamination or erosion issues or additional regulatory/approval requirements (e.g. Council Consent Conditions) associated with the earthworks.

There is a **HOLD POINT** on placing fill in Section 2.4 of this Specification.

# 2. Filling Works

# 2.1 Subgrade Preparation

The condition of the subgrade should be assessed immediately prior to the commencement of filling.

All Engineered Fill is to be placed on one of the following materials:

- 1. Bedrock.
- 2. Natural insitu material of at least stiff consistency.
- 3. Engineered compacted fill placed in accordance with this or other approved specifications for which the Geotechnical Inspection and Testing Authority (GITA) has a Level 1 certificate certifying compliance with that approved specification AND of at least stiff consistency.
- 4. Existing fill and other materials as approved by PSM.

Proof rolling shall only be undertaken under the direction of PSM. PSM may also direct a bridging layer of Engineered Fill be placed and compacted to a Dry or Hilf Density Ratio (Standard Compaction) of between 95% and 102%. Any such layer shall be a Lot under Clause 5.3.

The GITA should satisfy itself that the subgrade has not been desiccated, affected by rain or disturbed. If the GITA cannot so satisfy itself, then the subgrade should be moisture conditioned and compacted to be in accordance with Clauses 2.5 and 2.6 of this specification.

Engineered Fill shall be placed only on subgrade approved by the GITA as being in accordance with this specification.

# 2.2 Base Geometry

The slope of any buried batter shall be less than 1H:1V unless otherwise directed by PSM.

The contractor shall remove or flatten any geometrical obstructions (e.g. protrusions or holes) such that subsequent Engineered Fill can be placed to achieve the requirements of this specification.

Engineered Fill shall be placed only on areas where the base geometry has been approved by the GITA.

#### 2.3 Material

#### 2.3.1 Imported Fill

Imported Engineered Fill is to conform to one of the following definitions:

1. "Virgin excavated natural material" (VENM) as defined by the Protection of the Environment Operations Act 1997 No 156, Schedule 1, on Page 209:

"Virgin excavated natural material (eg clay, gravel, sand, soil and rock) that is not mixed with any other waste and that:

i. has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphide ores or soils, or



- ii. consists of excavated natural materials that meet such criteria as may be approved by the EPA".
- 2. "Excavated natural material" (ENM) as defined under Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014:

"Excavated natural material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- *i.* been excavated from the ground, and
- ii. contains at least 98% (by weight) natural material, and
- iii. does not meet the definition of Virgin Excavated Natural Material in the Act.
- iv. Excavated Natural Material does not include material that has been located in a hotspot; that has been processed; or that contains asbestos, Acid Sulphate Soils (ASS), Potential Acid Sulphate soils (PASS) or sulfidic ores."

#### 2.3.2 Blended Topsoil

Blended Topsoil is to comprise existing topsoil blended with materials defined by Clause 2.3.3. Blended Topsoil shall:

- Not include grass
- Be blended at a maximum ratio of 1 part topsoil to 8 parts site won natural clay, shale or other material as approved by PSM
- Be thoroughly mixed and homogenous.

The GITA shall assess the above criteria and approve the material as suitable for use as Engineered Fill.

Blended Topsoil shall not be placed within <u>3.0 m</u> of the final Bulk Earthworks Level (BEL).

#### 2.3.3 All Fill

The Engineered Fill shall be approved by the GITA as suitable for use in a structural fill.

Engineered Fill shall not comprise unsuitable material that includes:

- Organic soils, such as many topsoils, severely root-affected subsoils and peat
- Silts, or materials that have the deleterious engineering properties of silt
- Other materials with properties that are unsuitable for the forming of structural fill; unless it is approved by PSM.

The GITA shall assess that the proportion of deleterious material in each Lot is not greater than 1% by weight. Mirvac shall be consulted prior to the placement of deleterious material as Engineered Fill.

If the GITA is not able to visually assess the above criterion, the GITA shall arrange appropriate testing.

All Engineered Fill particles shall be able to be incorporated within a single layer. Further, less than 30% of particles shall be retained on the 37.5 mm sieve.

Engineered Fill shall be able to be tested in accordance with the Standard Compaction method (AS1289.5.4.1) or Hilf test method (AS1289.5.7.1). These methods require less than 20% retained on the 37.5 mm sieve. Where between 20% and 30% of particles are retained on the 37.5 mm sieve the above test methods shall still be adopted and test reports annotated appropriately.

These requirements should be met by the material after placement and compaction.

Only material approved by the GITA shall be placed as Engineered Fill.



# 2.4 Fill Zonation and Placement

## 2.4.1 HOLD POINT 1 (FILL PLACEMENT)

PROCESS HELD	PLACING OF FILL
Submission detail	The Contractor / GITA submit to PSM a Weekly Certificate as defined in Clause 6.2.1 of this specification for the earthworks completed to the previous Saturday no later than 5 pm of the subsequent Wednesday.
Release of Hold Point	PSM to confirm receipt of Weekly Certificate and recommend release of Hold Point if initial assessment of the Weekly Certificate indicates it complies with requirements of this specification. The contract superintendent should then release the Hold Point if it considers appropriate.

#### 2.4.2 HOLD POINT 2 (DELETERIOUS MATERIAL)

This Hold Point is only applicable if deleterious material is to be placed as Engineered Fill.

PROCESS HELD	PLACING OF FILL
Submission detail	If deleterious material is to be placed as Engineered Fill, the Contractor / GITA to notify Mirvac prior to the placement of the deleterious material. Volume and type of deleterious material, and the location they will be placed shall be indicated.
Release of Hold Point	Mirvac to assess the submission and the contract superintendent should then release the Hold Point upon confirmation from Mirvac

Engineered Fill shall be placed in accordance with the following requirements:

- 1. In near horizontal, laterally extensive layers of uniform material and thickness, deposited systematically across the work area as determined by the GITA.
- 2. The compacted thickness of each layer shall be equal to or less than 300 mm.

Engineered Fill shall only be placed on subgrade in accordance with this specification and approved by the GITA.

The following particular fill zonation requirements apply for this site:

1. Blended Topsoil as defined in Cl. 2.3.2 shall not be placed above BEL-3.0 m.

## 2.5 Compaction

Engineered Fill shall be placed and compacted to a Dry or Hilf Density Ratios (Standard Compaction) of between 98% and 102%.

The insitu density shall be measured over the full depth of each layer placed.

## 2.6 Moisture Control

The placement moisture variation or Hilf moisture variation shall be controlled to be between 2% dry of optimum and 2% wet of optimum.

Placement moisture of the Engineered Fill shall be measured.



# 3. Cutting

# 3.1 Subgrade Condition

The subgrade is to comprise one of the following materials:

- 1. Bedrock.
- 2. Natural insitu material of at least stiff consistency.
- 3. Existing fill and other materials as approved by PSM.

Proof rolling shall only be undertaken under the direction of PSM.

The GITA should satisfy itself that the subgrade has not been desiccated, affected by rain or disturbed. If the GITA cannot so satisfy itself, then the subgrade should be excavated and filled to the BEL in accordance with this specification.

# 4. Survey

## 4.1 Filling Areas

The survey requirements are as follows:

- Any approved subgrade shall be surveyed prior to first filling such that subgrade levels are established to within ± 0.1 m. The area subject to approval shall be assessed and shown on a plan drawing to an accuracy of at least +/- 5 m in plan.
- 2. The Lot boundaries shall be assessed and shown on a plan drawing to an accuracy of at least +/- 5 m in plan.
- 3. The location of the field density tests shall be assessed and shown on the Lot boundary plan drawing to an accuracy of at least +/-5 m in plan.
- 4. The elevation of the field density tests shall be surveyed to an accuracy of +/-0.05 m.

The plan drawing shall show at the boundaries of the site and other identifiable site features, so as to allow the location of the lots and the test to be recoverable.

# 4.2 Cutting areas

Any approved subgrade for cut areas shall be surveyed such that subgrade levels are established to within ± 0.1 m.

# 5. Inspection and Testing

## 5.1 Role of the GITA

A NATA accredited Geotechnical Inspection and Testing Authority (GITA) shall be contracted to document and certify that the works undertaken by the contractor has been completed in accordance with the relevant design and specifications.

# 5.2 Level 1 Control

The GITA shall adopt Level 1 responsibility as described in Section 8.2 of AS 3798-2007 "Guidelines on earthworks for commercial and residential developments":

"The primary objective of Level 1 Inspection and Testing is for the geotechnical inspection and testing authority (GITA) to be able to express an opinion on the compliance of the work. The GITA is responsible for ensuring that the inspection and testing are sufficient for this purpose.

The geotechnical inspection and testing authority needs to have competent personnel on site at all times while earthwork operations are undertaken. Such operations include:

- Completion of removal of topsoil
- Placing of imported or cut material



- Compaction and adding/removal of moisture
- Trenching and backfilling
- Test rolling
- Testing.

The superintendent should agree a suitable inspection and testing plan prior to commencement of the works.

On completion of the earthworks, the GITA will usually be required to provide a report setting out the inspections, sampling and testing it has carried out, and the locations and results thereof. Unless very unusual conditions apply, the GITA should also be able to express an opinion that the works (as far as it has been able to determine) comply with the requirements of the specification and drawings."

For this particular contract, Level 1 responsibility includes:

- 1. Lot testing as per Clause 5.3 of this specification.
- 2. A frequency of compaction testing not less than that specified in Clause 5.4 of this specification.
- 3. The GITA documenting and reporting its activity in the terms required by Clause 6 of this specification.
- 4. The GITA undertaking adequate inspections and testing to comply with the above requirements and to be able to certify the fill in the terms required by Clause 6 of this specification.

# 5.3 Lot Testing

This specification requires lot testing to be undertaken.

A Lot is defined as a single layer of Engineered Fill consisting of uniform material which has undergone similar treatment (both moisture conditioning and compaction) and that represents no more than one day's work.

Lot testing comprises the following:

- 1. A Lot shall be identified by the Contractor or the GITA with a Lot Number and presented for testing.
- 2. A Lot shall be deemed to be in accordance with the specification if all the tests undertaken within the Lot are in accordance with the specification, i.e. "a none to fail basis".
- 3. If any one test undertaken within a Lot fails, the whole of the Lot shall be reworked and retested.

Any portion of the placed Engineered Fill must be part of a single lot and all Lots will require approval by the GITA.

# 5.4 Testing Frequency (Compaction Testing)

The frequency of compaction testing for each lot shall not be less than the greater of:

- 1. For lot less than 50  $m^{3.}$ 
  - a. 1 test per lot.
- 2. For lot between 50 m<sup>3</sup> and 100 m<sup>3</sup>.
  - a. 2 tests per lot.
- 3. For lot greater than 100 m<sup>3.</sup>
  - a. 1 test per 300 m3 of material placed as Blended Topsoil as defined in Clause 2.3.2 of this specification.
  - b. 1 test per 500 m3 of material placed.
  - c. 3 tests per lot.

A laboratory moisture content test shall be undertaken for each field density test.

# 5.5 **Proof Rolling and Plate Load Testing**

Proof rolling, together with minor boxing out and refilling, of the upper surface of the bulk earthworks will be undertaken as directed by PSM. The plant to be adopted depends upon the design loads adopted by the structural engineers for each section of the site.

Plate load testing shall be undertaken at the direction of PSM at the following stages:



- 1. Following placement and compaction of the first two (2) layers of Blended Topsoil and subsequently as directed by PSM. Expected test frequency is 1 test per 5000 m<sup>3</sup> of Blended Topsoil.
- 2. At final bulk earthworks level (BEL). Expected test frequency is approximately a day of testing for each building pad.

The contractor is to make a suitable reaction (e.g. 20 tonne excavator) available for the tests.

# 5.6 Inspection, Testing and Survey

#### Cut areas:

- 1. Identify the subgrade as one of the three (3) subgrade types listed in Clause 3.1 of this specification and assess that the subgrade condition of cut areas is in accordance with the subgrade condition requirements of Clause 3.1 of this specification.
- 2. Should Engineered Fill be required to fill overcut areas, assess that filling has been placed in accordance with this specification.

#### Fill areas:

3. Identify the subgrade as one of the subgrade types listed in Clause 2.1 of this specification and assess that the subgrade condition of any area prior to placement of fill material is in accordance with the subgrade preparation requirements of Clause 2.1 of this specification. Should the subgrade material comprise "Other materials as approved by PSM, e.g., existing fill intended to be left in place.", PSM should be requested to inspect and provide approval prior to filling.

The GITA needs to include / refer to PSM approval in its weekly report for subgrade comprising existing fill and other materials as approved by PSM.

- 4. Assess that the base geometry of any area prior to placement of fill material is in accordance with the base geometry requirements of Clause 2.2 of this specification.
- 5. Assess that the material placed is in accordance with the fill material requirements of Clause 2.3 of this specification. Assess that Blended Topsoil placed is in accordance with the requirements of Clause 2.3.2 and Clause 2.3.3 of this specification.
- 6. Assess that the Engineered Fill has been placed in accordance with the requirements for fill zonation and placement of Clause 2.4 of this specification.
- 7. Assess that each Lot as presented for approval by the contractor is in accordance with the requirements for Lot definition of Clause 5.3 of this specification.
- 8. Ensure that the survey requirements in Clause 5 of this specification have been completed.
- 9. Estimate the approximate volume of Engineered Fill placed in each Lot presented for approval.
- 10. Conduct Lot testing in accordance with the construction control testing requirements of Clauses 5.3 and 5.4 of this specification.
- 11. Assess that the compaction of each Lot is in accordance with the requirements of Clause 2.5 of this specification. The GITA shall select a depth of insitu density tests that allows the density of the full layer to be assessed.
- 12. Assess that the moisture variation of each Lot is in accordance with the requirements for moisture control in Clause 2.6 of this specification.
- 13. Conduct material property testing in accordance with the material testing requirements in this specification.

# 6. Reporting and Certification

## 6.1 Reporting

The GITA shall produce at least the following reports:

- 1. Subgrade Approval Reports (a sample is attached). Such a report shall:
  - Document assessments undertaken for tasks 1 and task 3 of Clause 5.6 including reporting the subgrade type
  - Document the subgrade survey that has been undertaken



- Approve or reject the subgrade condition and base geometry for filling, based on tasks 3 and 4 of Clause 5.6
- Approve or reject the subgrade condition for cut areas based on task 1.
- 2. Lot Approval Reports (a sample is attached). Such a report shall:
  - Document assessments, testing and survey undertaken for tasks 3 to 13 of Clause 5.6
  - Report the results of testing undertaken for task 10 of Clause 5.6
  - Approve or reject lots based on tasks 11 and 12 of Clause 5.6.
- 3. Material Testing Reports. Such a report shall:
  - Report the results of material property testing undertaken for task 13 of Clause 5.6.
- 4. Daily Reports (a sample is attached). Such a report shall be completed daily and shall:
  - Document time spent on site by the GITA personnel
  - List subgrade assessments and approvals undertaken each day with reference to relevant Subgrade Approval Report(s)
  - List Lots presented, accepted and approved or rejected each day, with reference to relevant Lot Approval Report(s)
  - List survey undertaken each day as for task 8 of Clause 5.6 and not already documented in the Subgrade or Lot Approval Reports
  - Document other relevant activities undertaken on site that day (site instructions, breakdowns, compaction equipment used, etc.).

# 6.2 Certification

## 6.2.1 Weekly Certificates

The GITA shall produce a Weekly Certificate for any week in which earthworks are undertaken in accordance with this specification. The Weekly Certificate will cover all works from the previous Weekly Certificate until the end of work on a Saturday.

The Weekly Certificate shall transmit the following:

- Copy or reference to the complete specification document(s)
- Subgrade Approval Reports
- Lot Approval Reports
- Material property testing reports
- Daily Reports
- Survey of subgrade geometry prior to filling or in cut areas
- Plan survey drawing showing lot boundaries and location of density tests
- Survey documenting filling undertaken to date and showing location of testing
- Provide an Excel spreadsheet presenting the results of the week's acceptance testing completed by the GITA.

#### And certify that:

"All the earthworks undertaken and the subgrade condition in the cut areas [in the stated period] are documented in the above reports and have been undertaken in accordance with the Specification (Ref. PSM3530-004S Rev XX dated XXX)."

## 6.2.2 Interim or Final Filling Certificate

At the completion of the bulk earthworks, or as requested by the Client, the GITA shall provide an Interim or Final Filling Certificate which shall:

- 1. Transmit a reference list of the Weekly Certificates.
- 2. Provide an Excel spreadsheet presenting the results of all the acceptance testing completed by the GITA.

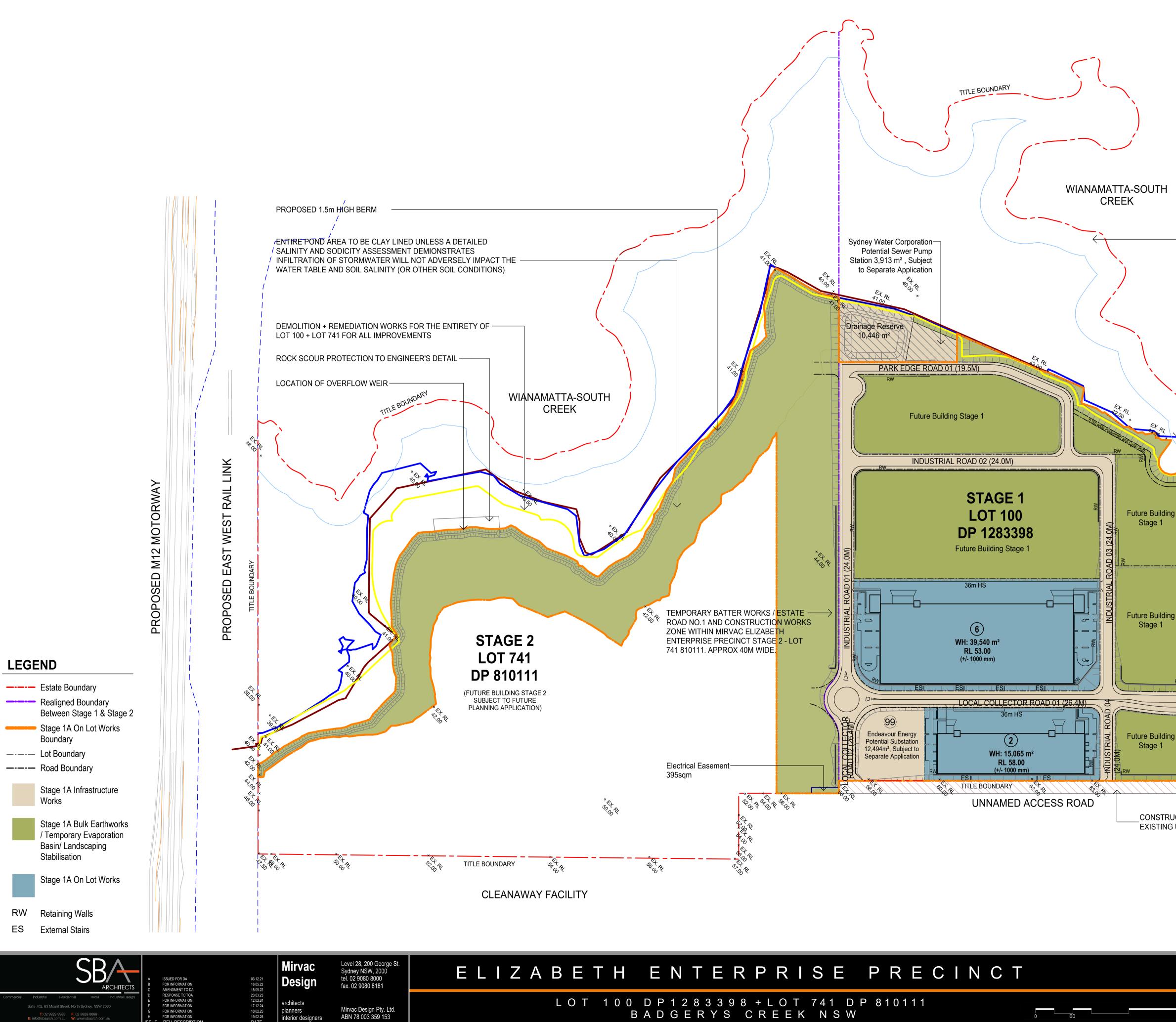


3. Certify that "All the earthworks undertaken and the subgrade condition in the cut areas [in the stated period] are documented in the above reports and have been undertaken in accordance with the Specification (Ref. PSM3530-004S Rev XX dated XXX)."



Attachment 1 Figure 1 and 2





REV. DESCRIPTIC

LOT 100 DP1283398 + LOT 741 DP 810111 BADGERYS CREEK NSW

0 60

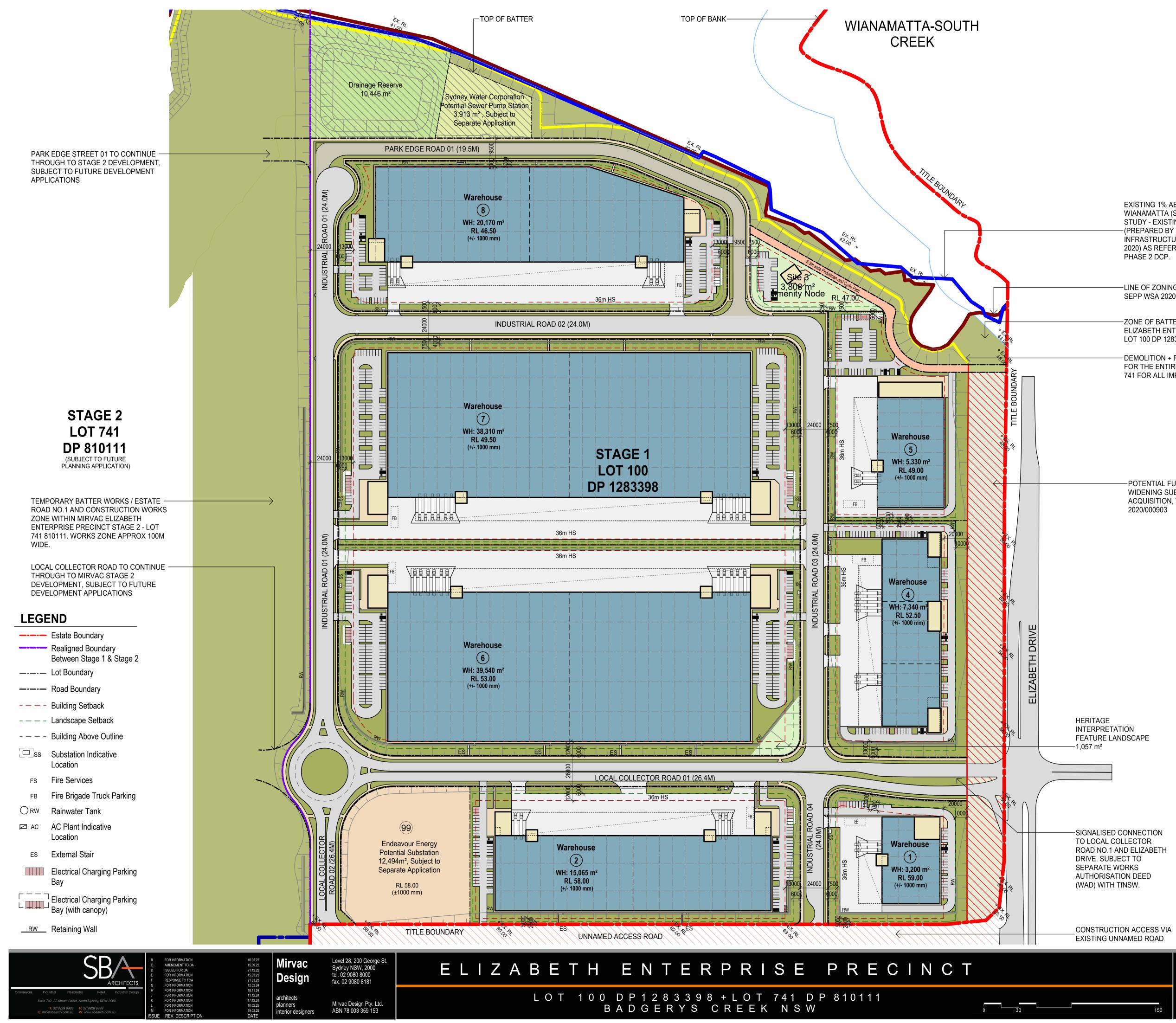


40M VEGETATED RIPARIAN ZONE (VRZ) FROM TOP OF BANK -AS PER NRAR GUIDELINES FOR 4TH ORDER AND ABOVE WATERCOURSES -EXISTING 1% AEP FLOOD EXTENT WIANAMATTA (SOUTH) CREEK FLOOD **STUDY - EXISTING CONDITIONS** (PREPARED BY ADVISIAN FOR INFRASTRUCTURE NSW, NOVEMBER 2020) AS REFERRED TO WITHIN THE PHASE 2 DCP. LOT 2 LINE OF ZONING BOUNDARY AS Site 2 Area 33,234 m² PER SEPP WSA 2020 LAND 15,065 m² Warehouse -ZONING MAP Office 1,060 m<sup>2</sup> DEMOLITION + REMEDIATION Dock Office 200 m² WORKS FOR THE ENTIRETY OF GFA 16,325 m² LOT 100 + LOT 741 FOR ALL Carparking Required 83 IMPROVEMENTS Cars Provided 84 LOT 6 Site 6 Area -POTENTIAL FUTURE ELIZABETH 70,705 m² DRIVE WIDENING SUBJECT TO 39,540 m² Warehouse JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903 Office 1,900 m<sup>2</sup> Dock Office 200 m² GFA 41,640 m² DRIVE 185 Carparking Required Cars Provided 186 ELIZABETH OVERALL DEVELOPMENT DATA Lot 100 Total Lot 741 390,949 m² 517,759 m² 908,708 m<sup>2</sup> Estate Area 175,879 m<sup>2</sup> 247,829 m² 423,708 m<sup>2</sup> Flood Prone Area 765,588 m<sup>2</sup> 1,332,416 m<sup>2</sup> 566,828 m<sup>2</sup> Site Area Amenity Node 3,808 m² 3,808 m<sup>2</sup> 268,020 m² Warehouse Allotments 268,020 m<sup>2</sup> 368,994 m<sup>2</sup> Future Stage 2 368,994 m<sup>2</sup> 368,994 m<sup>2</sup> 640,822 m<sup>2</sup> Net Developable Area 271,828 m² 128,955 m² 128,955 m<sup>2</sup> Warehouse Office 9,750 m² 9,750 m<sup>2</sup> Cafe 150 m² 150 m² Dock Office 1,000 m<sup>2</sup> 1,000 m<sup>2</sup> Gross Lettable Area 139,855 m<sup>2</sup> 139,855 m<sup>2</sup> -CONSTRUCTION ACCESS VIA Batter Asset Protection Zone 10,597 m² 25,695 m<sup>2</sup> 36,292 m<sup>2</sup> EXISTING UNNAMED ROAD **Electrical Easement** 395 m² 395 m² Drainage Reserve 10,446 m² 10,446 m<sup>2</sup> 1,590 m<sup>2</sup> 1,590 m<sup>2</sup> Paths + Accessways 14,968 m<sup>2</sup> 14,968 m<sup>2</sup> Potential Road Widening 65,113 m² 65,113 m<sup>2</sup> Road Reserves + Access Ways Zone Substation Allotment 12,494 m<sup>2</sup> 12,494 m<sup>2</sup> 175,879 m<sup>2</sup> 423,708 m<sup>2</sup> Flood Prone Area/ ENZ 247,829 m<sup>2</sup> Temporary Berm + Basin 122,675 m<sup>2</sup> 122,675 m<sup>2</sup> Potential Sewer Pump Station 3,913 m<sup>2</sup> 3,913 m<sup>2</sup> 295,000 m<sup>2</sup> 396,594 m<sup>2</sup> 691,594 m<sup>2</sup> Non Developable Area RAWING TITLE **ESTATE WORKS STAGING PLAN -**STAGE 1a

scale 1:3000@A1 1:6000@A3

DATE 19.02.25

JOB NO. DRAWING NO. 20266 MP 03





LOT DEVELOPMENT DATA

EXISTING 1% AEP FLOOD EXTENT	Site 1 Area Warehouse Office Dock Office GFA Cars Provided Site 2 Area	12,900 m <sup>2</sup> 3,200 m <sup>2</sup> 830 m <sup>2</sup> 100 m <sup>2</sup> 4,130 m <sup>2</sup> 35 33,234 m <sup>2</sup>
WIANAMATTA (SOUTH) CREEK FLOOD STUDY - EXISTING CONDITIONS — (PREPARED BY ADVISIAN FOR INFRASTRUCTURE NSW, NOVEMBER 2020) AS REFERRED TO WITHIN THE PHASE 2 DCP.	Warehouse Office Dock Office GFA	15,065 m <sup>2</sup> 1,060 m <sup>2</sup> 200 m <sup>2</sup> 16,325 m <sup>2</sup>
	Cars Provided Cafe (Site 3) Cars Provided	84 150 m² 23
—LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP	Site 4 Area Warehouse Office GFA	23,907 m² 7,340 m² 1,650 m² 8,990 m²
—ZONE OF BATTER WORKS WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 1, LOT 100 DP 1283398.	Cars Provided Site 5 Area Warehouse	69 18,014 m <sup>2</sup> 5,330 m <sup>2</sup>
— DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS	Office Dock Office GFA Cars Provided	1,410 m <sup>2</sup> 100 m <sup>2</sup> 6,840 m <sup>2</sup> 56
	Site 6 Area Warehouse Office Dock Office GFA Cars Provided	70,705 m² 39,540 m² 1,900 m² 200 m² 41,640 m² 186
— POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903	Site 7 Area Warehouse Office Dock Office GFA Cars Provided	69,372 m² 38,310 m² 1,900 m² 200 m² 40,410 m² 182
	Site 8 Area Warehouse Office Dock Office GFA Cars Provided	39,888 m² 20,170 m² 1,000 m² 200 m² 21,370 m² 102

OVERALL DEVELOPMENT DATA			
	Stage 1 Lot 100	Stage 2 Lot 741	Total
Estate Area	390,949 m²	517,759 m <sup>2</sup>	908,708 m²
Flood Prone Area	175,879 m²	247,829 m <sup>2</sup>	423,708 m <sup>2</sup>
Site Area	566,828 m <sup>2</sup>	765,588 m <sup>2</sup>	1,332,416 m <sup>2</sup>
Amenity Node	3,808 m²	-	3,808 m²
Warehouse Allotments	268,020 m²	-	268,020 m²
Future Stage 2	-	368,994 m²	368,994 m²
Net Developable Area	271,828 m <sup>2</sup>	368,994 m <sup>2</sup>	640,822 m <sup>2</sup>
Warehouse	128,955 m²	-	128,955 m²
Office	9,750 m²	-	9,750 m²
Cafe	150 m²	-	150 m²
Dock Office	1,000 m²	-	1,000 m²
Gross Lettable Area	139,855 m <sup>2</sup>		139,855 m <sup>2</sup>
OIUSS LEllable Alea	159,055 11	-	159,055 11
Batter Asset Protection Zone	10,597 m <sup>2</sup>	- 25,695 m²	36,292 m <sup>2</sup>
		- 25,695 m² 395 m²	
Batter Asset Protection Zone			36,292 m²
Batter Asset Protection Zone Electrical Easement	10,597 m² -		36,292 m² 395 m²
Batter Asset Protection Zone Electrical Easement Drainage Reserve	10,597 m² - 10,446 m²		36,292 m² 395 m² 10,446 m²
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways	10,597 m² - 10,446 m² 1,590 m²		36,292 m² 395 m² 10,446 m² 1,590 m²
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup>	395 m² - - - -	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup>	395 m² - - - - 247,829 m²	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup>	395 m² - - - -	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup>	395 m² - - - - 247,829 m²	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 175,879 m <sup>2</sup> -	395 m² - - - - 247,829 m²	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin Potential Sewer Pump Station	10,597 m <sup>2</sup> - 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 175,879 m <sup>2</sup> - 3,913 m <sup>2</sup>	395 m <sup>2</sup> - - - 247,829 m <sup>2</sup> 122,675 m <sup>2</sup> -	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup> 3,913 m <sup>2</sup>
Batter Asset Protection Zone Electrical Easement Drainage Reserve Paths + Accessways Potential Road Widening Road Reserves + Access Ways Zone Substation Allotment Flood Prone Area/ ENZ Temporary Berm + Basin Potential Sewer Pump Station Non Developable Area	10,597 m² - 10,446 m² 1,590 m² 14,968 m² 65,113 m² 12,494 m² 175,879 m² - 3,913 m² 295,000 m²	395 m <sup>2</sup> - - - 247,829 m <sup>2</sup> 122,675 m <sup>2</sup> - 396,594 m <sup>2</sup>	36,292 m <sup>2</sup> 395 m <sup>2</sup> 10,446 m <sup>2</sup> 1,590 m <sup>2</sup> 14,968 m <sup>2</sup> 65,113 m <sup>2</sup> 12,494 m <sup>2</sup> 423,708 m <sup>2</sup> 122,675 m <sup>2</sup> 3,913 m <sup>2</sup> 691,594 m <sup>2</sup>



# RAWING TITLE SSDA MASTERPLAN - STAGE 1

<sup>DATE</sup> 19.02.25

1:1500@A1 1:3000@A3

Attachment 2 Subgrade Approval Report (Sample Only)



# **GEOTECHNICAL INSPECTION AND TESTING AUTHORITY**

NATA accreditation number



P S M

Client:	Contractor:
Job number:	Report number:
Project:	Technician:
Subgrade areas assessed: Area ID Date Approximate Subgrade description	Geometry summary Specification Compliance Survey Approved
Area ID Date Approximate Subgrade description	Geometry summary Specification Compliance Survey Approved (Pass/Fail) reference (Yes/No)
COMMENTS:	
Signed:	Date:

Attachment 3 Lot Approval Report (Sample Only)



**GEOTECHNICAL INSPECTION AND TESTING AUTHORITY** 

NATA accreditation number

# LOT APPROVAL REPORT

Client:			Report number	ər:	
Job number:			Report date:		
Project:			Technician:		
Contractor:		Test methods:			
LOT ID:			Sheet	of	
Retest (Yes/No)			Original test re	port number:	
Specification reference				- Announce -	
Location:			$\sim$	$\sim$	
Lot boundary survey reference/loca	ntion:			$\rightarrow \rightarrow \rightarrow$	
Materials description:		r components, maximum particle s	size)		
Material identification:		in Clause 2.3.1, Clause 2.3.2, or Č	1	cification )	
Deleterious material assessment:	(Report proportion of deleterious		and a second and a s		
Layer thickness:	_ <u>· · · · · ·</u>		and the second sec		
Accepted as Lot: (Yes/No)			Date:		
Approximate volume (m3)		- ^	Number of te	sts required:	
Test ID No.		$r / \sim$			
	<u> </u>				
	A.	$\sim$ $\sim$ $\sim$ $\sim$			
Test soil description	$\langle \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$				
		$\sim$ $>$			
Date tested:	$\Gamma$ ( $\land$ ) $\land$				
Grid reference					
\[         \]     \[					
Surveyed test locations	$\land \land \land \land \land \land$				
(RL,E,N)					
Test depth (mm)					
Max size (mm)					
% Oversize material (wet)					
Field wet density (t/m <sup>3</sup> )					
Field moisture content (%)					
PWCD (t/m <sup>3</sup> )					
Compactive effort					
Moisture variation (%)					
HILF density ratio (%)					
TEST (Pass/Fail)					
LOT APPROVAL	(Pass/Fail)	Signed:		Date:	

P S M

Attachment 4 Daily Report (Sample Only)



# **GEOTECHNICAL INSPECTION AND TESTING AUTHORITY**

NATA accreditation number

# DAILY REPORT



Client:		Depart aurobary	
Job number:		Report number: Report date:	
Project:		Report date.	
Location:		Level of testing: Level 1	
Contractor		Technician:	
Time on site: Time off site:			
1. Subgrade App	roval		
Areas ID	Subgrade Approval Report No:	Comments	
2. Lot Approval			
Lot ID	Lot Approval Report No:	Comments	
3. Survey		. 47	
Type of survey	Survey undertaken by:	Reference	
4. Instructions re	ceived on site		
5. Instructions give	vèn on site		
COMMENTS			
Oime a l		Dette	
Signed:		Date:	

Attachment 5 Certification Letter (Sample Only)



#### SAMPLE INTERIM (OR FINAL) FILLING CERTIFICATE

Letter Ref: Date:

Addressed to EARTHWORK CONTRACTOR ATTENTION: EARTHWORK CONTRACTOR REPRESENTATIVE

Dear Sir

#### RE: INTERIM (OR FINAL) FILLING CERTIFICATE INDUSTRIAL DEVELOPMENT, BULK EARTHWORKS CERTIFICATION OF EARTHWORKS BETWEEN [DATE OF COMMENCEMENT] AND [DATE OF COMPLETION]

In the period between [date start] and [date finish] the contractor has undertaken earthworks in areas XXX and XXX.

During the above period:

- The GITA has prepared the following Subgrade Approval Reports:
  - 1. Subgrade Approval Report No 1
  - 2. .....
- The GITA has prepared the following Lot Approval Reports:
  - 1. Lot Approval Report No 1
  - 2. .....
- The GITA has prepared the following Daily Reports:
  - 1. Daily Report No 1.....
  - 2. .....

2. .....

- The following subgrade survey was undertaken:
  - 1. Subgrade Survey reference.....
- The following weekly survey was undertaken:
  - 1. Weekly survey of week ending ......reference......
  - 2.

Copies of all the above documents are attached.

The GITA certifies that all the earthworks undertaken in the above stated period are documented in the above reports and have been undertaken in accordance with the Specifications (ref. PSM3530-004S, dated XXX) a copy of which is attached, with the exception of:

List outstanding issues (not approved subgrade, lots, unsuitable material, failed tests etc.)
 ......

Signed

GITA