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 Test ID	Elevation to Top of Unit (RL m AHD)					
	TOPSOIL	FILL	NATURAL SOIL	BEDROCK A	BEDROCK B	EOH
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 [1]	44.5
BH21	N/E	46.1	44.6	41.6	41.1 [1]	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 Test ID	Elevation to Top of Unit (RL m AHD)					
	TOPSOIL	FILL	NATURAL SOIL	BEDROCK A	BEDROCK B	EOH
BH33	58.1	N/E	58.0	55.9	53.5 [1]	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/m^3)	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.

YOURS SINCERELY

KELVIN LIM
ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

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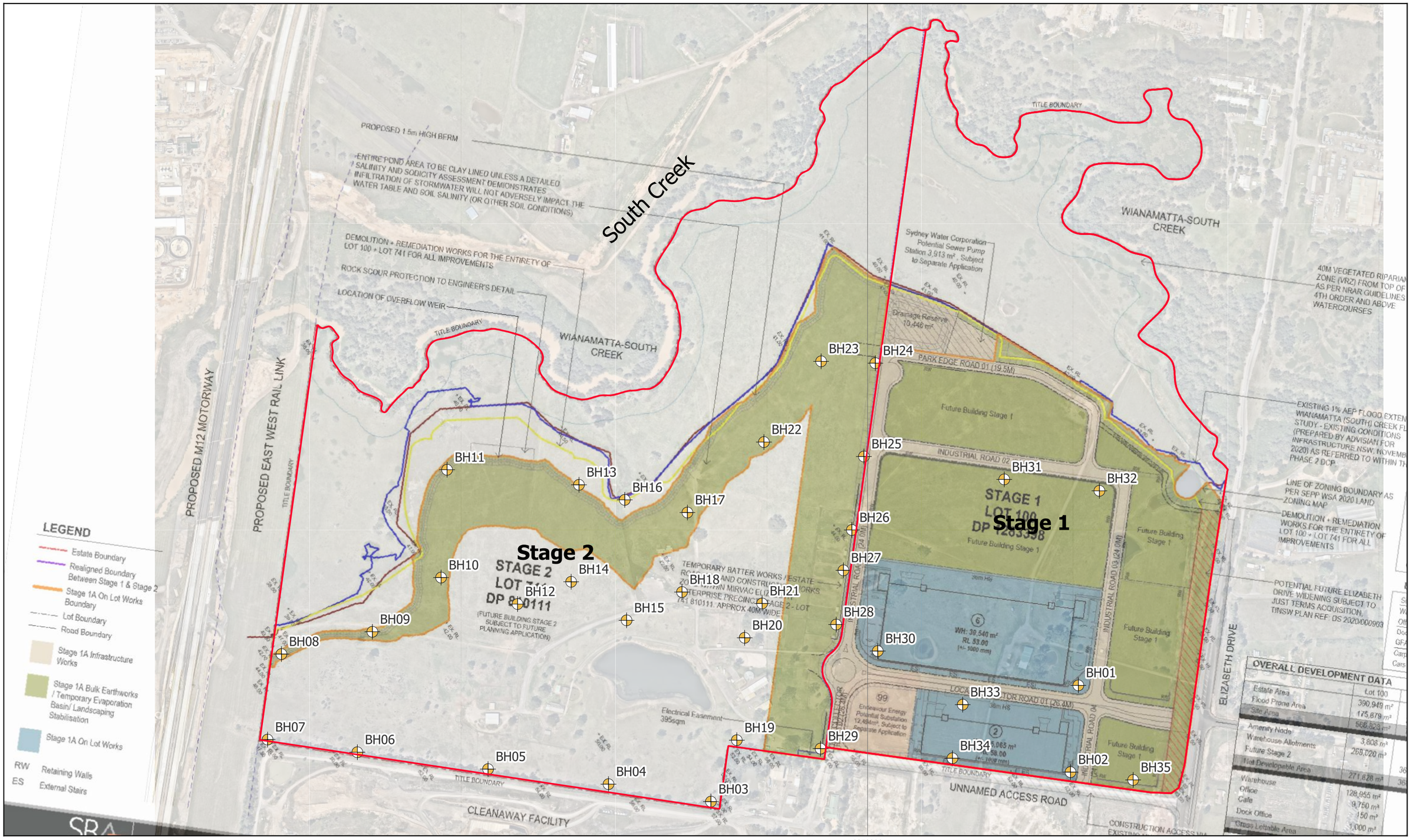


6250000

Legend

- Approximate site boundary
- Approximate BH Locations

Note:
1. Aerial image of site on 3 January 2024 (source: Nearmap.com)
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"

Scale 1:6,000

0 100 200 m

Map Projection:
Horizontal Datum:
Grid: EPSG:7856

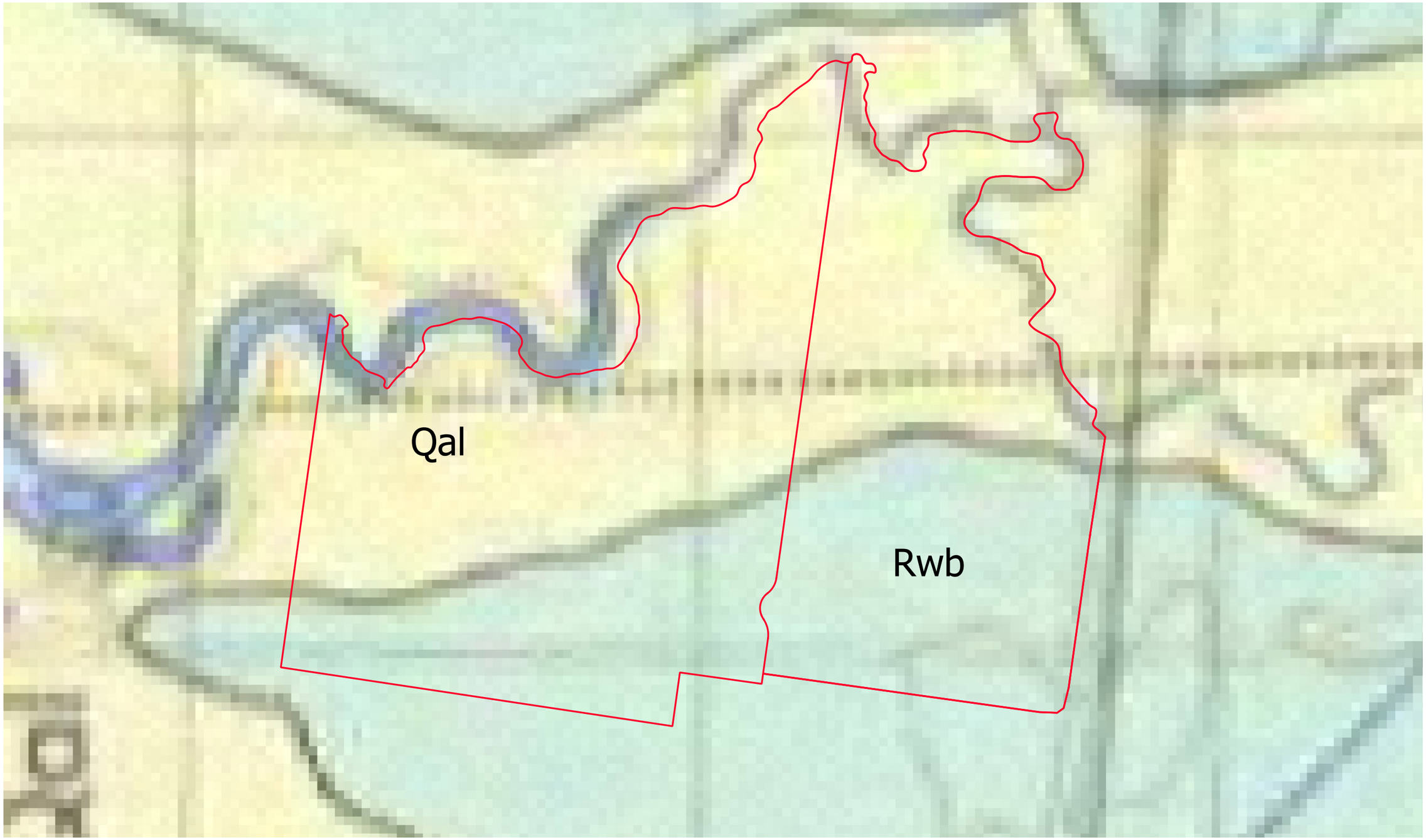
P S M	Created By: PSM	Revision: A	
	Date: 04 Mar 2025	Paper Size: A3	

Mirvac
EEP Stage 1+2
1669-1723 Elizabeth Drive,
Badgerys Creek

SITE LOCALITY PLAN

PSM3530-018R | Figure 1

O:\PSM3530\Eng\QGIS\02_WorkSpace\01_Projects\Masterfile.qgz Layout: PSM3530-018R



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.

Scale 1:7,500

0 50 100 150 200 m

Horizontal Datum: GDA2020
Grid: MGA Zone 56

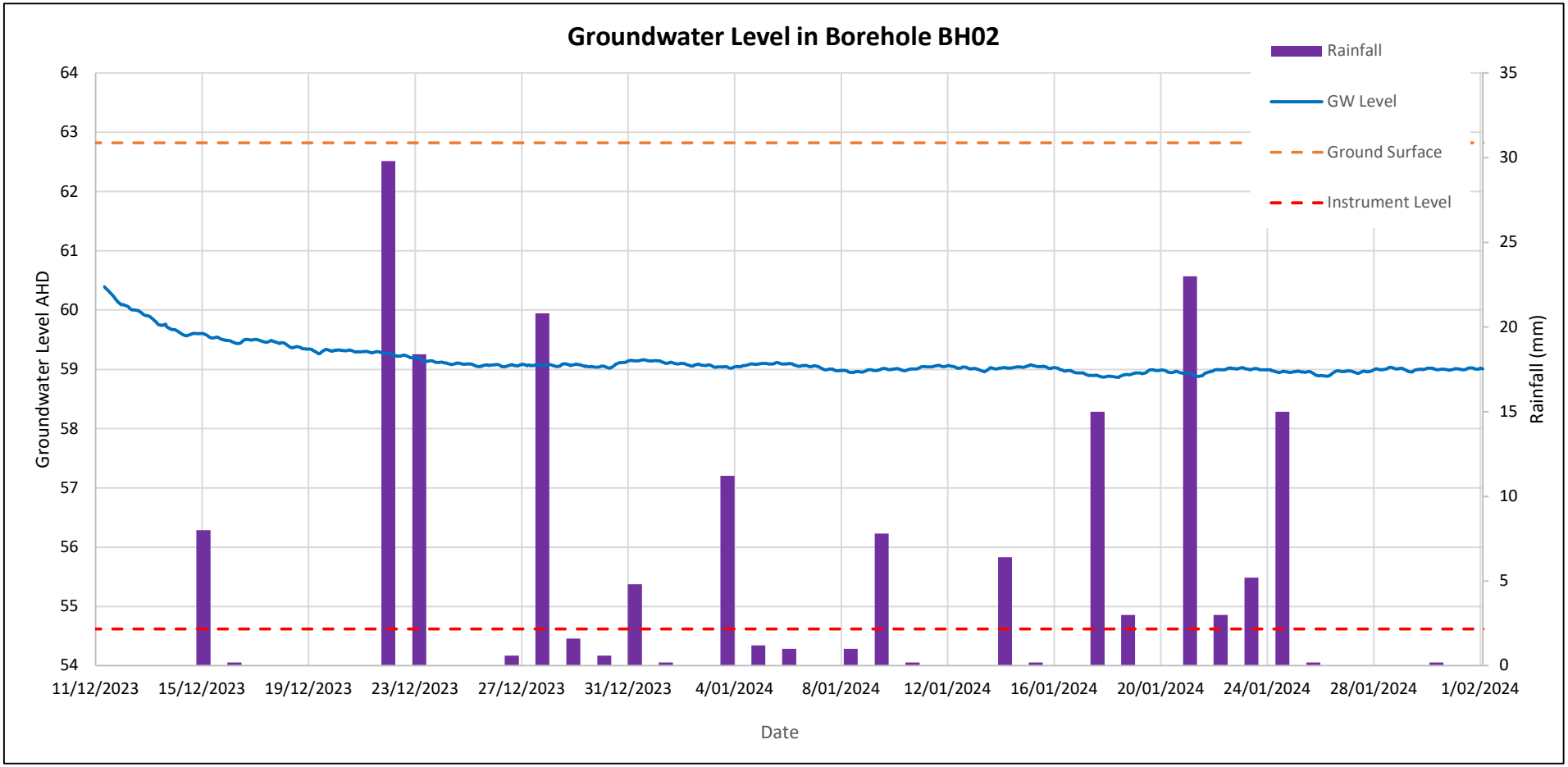
P S M	Created By: JBL	Revision: A	
	Date: 03 Mar 2025	Paper Size: A3	

Mirvac
EEP Stage 1+2
1669 - 1723 Elizabeth Drive, Badgerys Creek

Geological Map

PSM3530-018R | Figure 2

O:\PSM3530\Eng\QGIS\02_WorkSpace\01_Projects\Masterfile.qgz Layout: Geological (QGIS style)



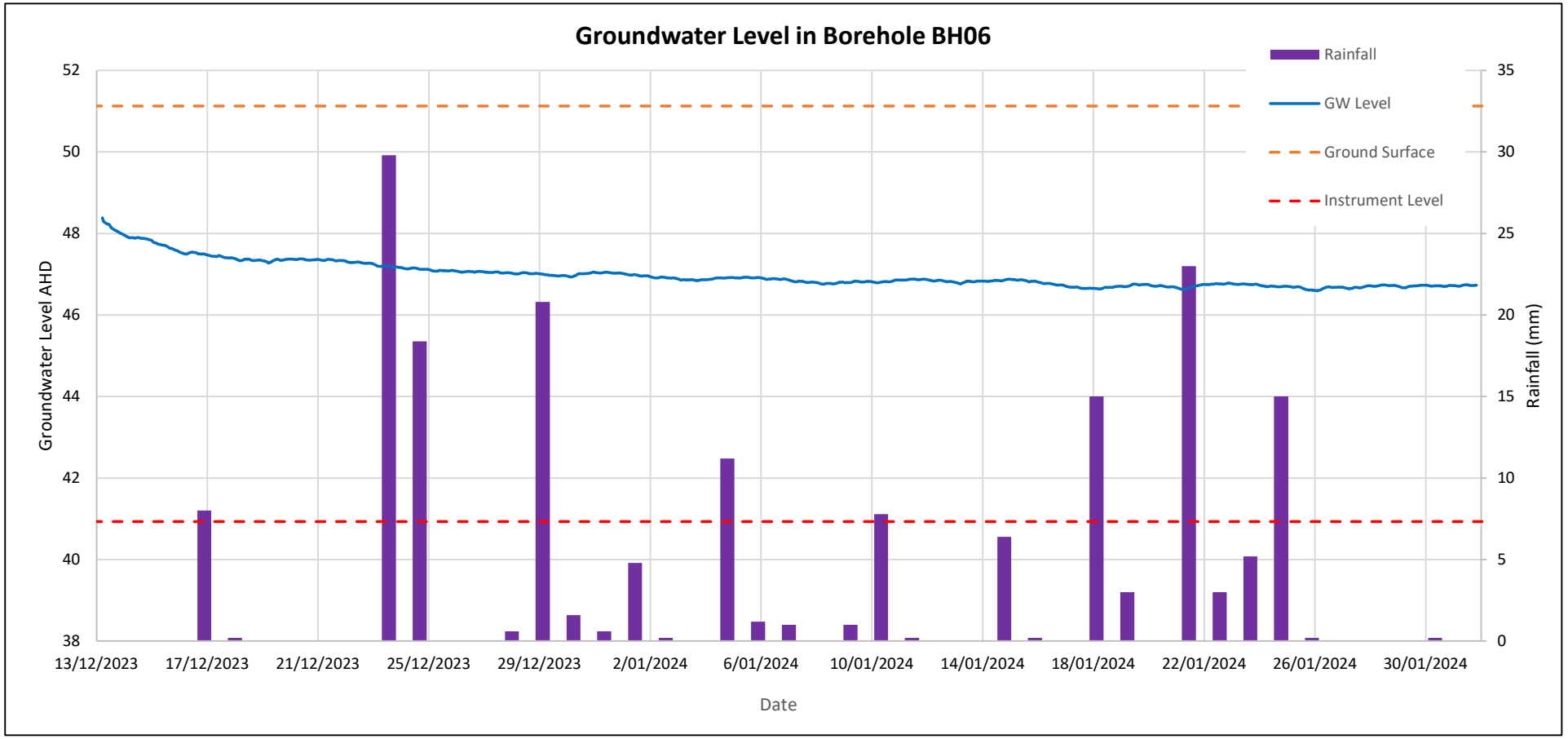
Notes:

1. Instument Elevation (m RL) 54.62
2. Ground Surface Elevation 62.82
3. Data Logger Instrument Installed on 11/12/2023
4. Bottom of Seal (m RL) 60.32
5. Bottom of Screen (m RL) 57.12
6. Rainfall data from BOM station 67108, downloaded 01/02/2024

Mirvac Industrial Developments
Groundwater Level Monitoring
Elizabeth Drive Enterprise Precinct,
Badgery's Creek
Stage 1+2 BH02 Groundwater Levels

PSM3530-018R | Figure 3

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



Notes:

1. Instument Elevation (m RL) 40.93
2. Ground Surface Elevation 51.13
3. Data Logger Instrument Installed on 11/12/2023
4. Bottom of Seal (m RL) 49.63
5. Bottom of Screen (m RL) 46.43
6. Rainfall data from BOM station 67108, downloaded 01/02/2024

Mirvac Industrial Developments
Groundwater Level Monitoring
Elizabeth Drive Enterprise Precinct,
Badgery's Creek
Stage 1 + 2 - BH06 Groundwater Levels

PSM3530-018R	Figure 4

O:\PSM3530\Eng\Stage 2 Site Investigation (2023)\01 Site\04. Groundwater Monitoring\Processed\PSM3530 20240201\[BH06.xlsx]BH06

Appendix A
Selected Site Photographs

Photo 1 - General Site Photo facing South from BH01

Photo 2 - General Site Photo facing North from BH02

Mirvac

EEP Stage 1 + 2

1669 - 1723 ELIZABETH DRIVE, BADGERYS CREEK

SELECTED SITE PHOTOGRAPHS (1 OF 5)

PSM3530-018R	**Appendix A**

Photo 3 - General Site Photo facing North from BH03

Photo 4 - General Site Photo facing East from BH04

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EEP Stage 1 + 2

1669 - 1723 ELIZABETH DRIVE, BADGERYS CREEK

SELECTED SITE PHOTOGRAPHS (2 OF 5)

PSM3530-018R	**Appendix A**

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

Photo 6 - General Site Photo facing East from BH14

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EEP Stage 1 + 2

1669 - 1723 ELIZABETH DRIVE, BADGERYS CREEK

SELECTED SITE PHOTOGRAPHS (3 OF 5)

PSM3530-018R	**Appendix A**

Photo 7 - General Site Photo facing West from BH17

Photo 8 - General Site Photo facing East from BH23

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EEP Stage 1 + 2

1669 - 1723 ELIZABETH DRIVE, BADGERYS CREEK

SELECTED SITE PHOTOGRAPHS (4 OF 5)

PSM3530-018R	**Appendix A**

Photo 9 - Typical Drill Rig Set Up

Photo 10 - Typical Soil Profile Encountered

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EEP Stage 1 + 2

1669 - 1723 ELIZABETH DRIVE, BADGERYS CREEK

SELECTED SITE PHOTOGRAPHS (5 OF 5)

PSM3530-018R	**Appendix A**

Appendix B
Borehole Logs and Piezometer Construction

Borehole ID

BH01

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293188.0 m E 6249650.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	59.40 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 3,8,7 N=15		58.4	1		CH	TOPSOIL: CLAY: high plasticity, brown grey, rootlets observed				
									CH	CLAY: high plasticity, brown grey				0.20: INFERRED NATURAL
AD/T		N		SPT 1.50-1.95 m 2,10,12 N=22		57.4	2				D	VSt		
						56.4	3			Continued on cored borehole sheet				
						55.4	4							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293188.0 m E 6249650.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 59.40 m
Barrel Type and Length: 3 m Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information							Rock Substance					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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL L M H VH EH 0.1 0.3 1 3 10	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					58.4	1						
					57.4	2						
					56.4	3		Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	77	SPT 11,25 HB N=R 3.30m Is(50) d=0.28 a=0.53 MPa		55.4	4		SILTSTONE: grey, extremely to highly weathered, thinly laminated Becomes moderately weathered				BP, 10°, CN, UN, S BP, 5°, CL VN, PR, S

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293188.0 m E 6249650.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 59.40 m
Barrel Type and Length: 3 m Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information							Rock Substance				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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL L M H VH EH 0.1 0.3 1 3 10	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
NMLC	75-100% Water RETURN	77	Is(50) d=0.17 a=0.13 MPa					SILTSTONE: grey, extremely to highly weathered, thinly laminated *(continued)*				
								Becomes slightly weathered				
			Is(50) d=0.14 a=0.16 MPa		53.4	6						JT, 70°, CL VN, PR, S
		87										RF, 20 mm
					52.4	7						JT, 70°, CL VN, S
												BP, 5°, CN, CU, S
												JT, 60°, RF, PR, S
								LAMINITE: 70% SILTSTONE, 30% SANDSTONE, pale grey and yellow, sandstone is medium grained, thinly laminated				
			Is(50) d=0.14 a=0.16 MPa		51.4	8						
			Is(50) d=0.14 a=0.26 MPa									JT, 85°, PR, ST, S
								SILTSTONE: dark grey, slightly weathered, thinly laminated				
					50.4	9						
		100	Is(50) d=0.01 a=0.05 MPa									
			Is(50) d=0.04 MPa									BP, 5°, CL VN, UN, S
			Is(50) a=0.09 MPa					Hole Terminated at 10.00 m Target depth				

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Mirvac

Elizabeth Enterprise Precinct

1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH01

(Core Photo 1 OF 2)

PSM3530-018R	**Appendix B**

Mirvac

Elizabeth Enterprise Precinct

1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH01

(Core Photo 2 OF 2)

PSM3530-018R	**Appendix B**

Borehole ID

BH02

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293044.0 m E 6249663.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 62.80 m

Hole Diameter: Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 2,5,5 N=10		61.8	1		CH	TOPSOIL: CLAY: high plasticity, brown and red, rootlets observed	D	St		
									CH	CLAY: high plasticity, grey mottled red				0.20: INFERRED NATURAL
AD/T		N		SPT 1.50-1.95 m 4,11,14 N=25		60.8	2				M	VSt		
				SPT 3.00-3.45 m 6,12,23 N=35		59.8	3					H		
						58.8	4			Continued on cored borehole sheet				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293044.0 m E 6249663.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 | Inclination: -90° | RL Surface: 62.80 m
Barrel Type and Length: 3 m | Bearing: | Datum: AHD | Operator: Matrix Drilling

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, alteration)	Weathering (XW HW MW SW FR)	Strength Is(50) (● - Axial, ○ - Diametral) (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments (Description, alpha/beta, infilling or coating, shape, roughness, thickness, other)
					61.8	1						
					60.8	2						
					59.8	3						
								Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	0			58.8	4		CLAY: high plasticity, grey mottled red				
								CORE LOSS				

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube

WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	11/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	11/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293044.0 m E 6249663.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	62.80 m		
Barrel Type and Length:	3 m	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information | **Rock Substance** | **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, alteration)	Weathering (XW HW MW SW FR)	Strength Is(50) (● - Axial, O - Diametral) (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments (Description, alpha/beta, infilling or coating, shape, roughness, thickness, other)
NMLC	75-100% Water RETURN	0					Core loss	CORE LOSS *(continued)*				
		94			56.8	6		CLAY: high plasticity, grey and brown				
					55.8	7						
			Is(50) d=0.1 a=0.02 MPa		54.8	8		SILTSTONE: grey and brown, extremely to highly weathered, thinly laminated	XW–HW	VL		8.00: INFERRED BEDROCK
												BP, 3°, RF, PR, S
			Is(50) d=0.06 MPa									
					53.8	9						BP, 5°, CL CO, PR, S
												BP, 5°, CN, PR, S
												CZ
								Hole Terminated at 9.10 m Target depth				

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

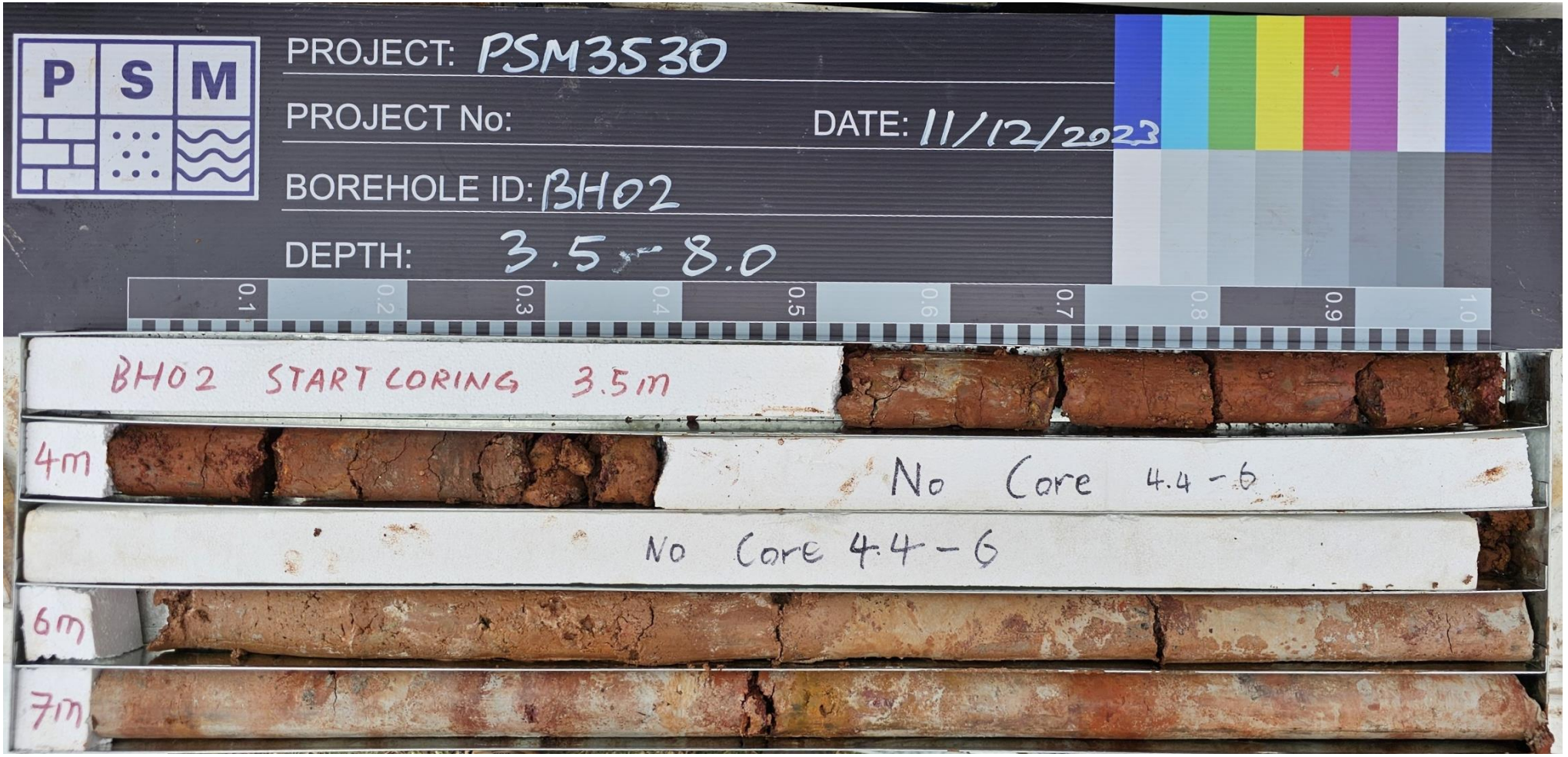
Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations



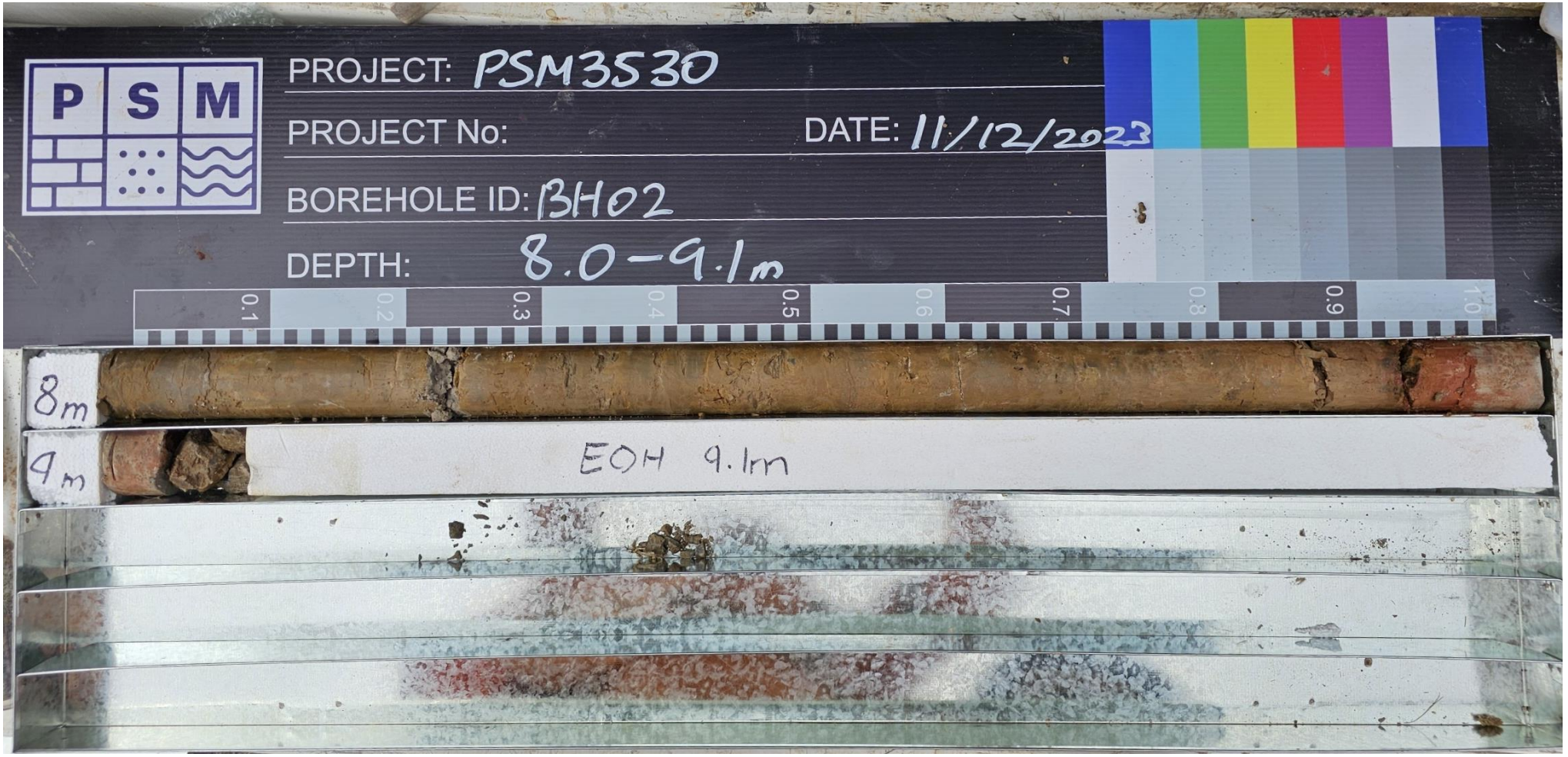
Mirvac

Elizabeth Enterprise Precinct

1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH02

(Core Photo 1 OF 2)

PSM3530-018R	**Appendix B**



Mirvac **Elizabeth Enterprise Precinct** **1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH02** **(Core Photo 2 OF 2)**	
PSM3530-018R	**Appendix B**

Borehole ID

BH03

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	292995.0 m E 6250260.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	55.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CH	TOPSOIL: CLAY: high plasticity, brown, rootlets observed				
									CH	CLAY: high plasticity, brown and red				0.25: INFERRED NATURAL
				SPT 0.50-0.95 m 2,15,35 N=50		54.9	1				D	H		
				SPT 1.50-1.95 m 3,3,5 N=8		53.9	2			Becomes brown		St		
AD/T		N								Becomes grey	D to M			
				SPT 3.00-3.45 m 7,20,29 N=49		52.9	3					H		3.30: Layer of ironstone observe in SPT sample
						51.9	4				D			
				SPT 4.50-4.87 m 10,35,21/70mm HB N=R						SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey and brown				4.50: INFERRED BEDROCK

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	292995.0 m E 6250260.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	55.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N		SPT 6.00-6.30 m 3,38 HB N=R ES 6.00 m		49.9	6			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey and brown *(continued)*	D			
						48.9	7			Continued on cored borehole sheet				
						47.9	8							
						46.9	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	292995.0 m E 6250260.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 55.90 m
Barrel Type and Length: 3 m Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information							Rock Substance					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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL L M H VH EH 0.1 0.3 1 3 10	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					49.9	6						
					48.9	7		Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	80			47.9	8		SILTSTONE: grey and brown, extremely to highly weathered, thinly laminated				BP, 0°, CN, PR, S BP, 0°, CL VN, PR, S BP, 5°, CN, UN, S
		88	Is(50) d=0.1 a=0.09 MPa Is(50) d=0.15 a=0.2 MPa		46.9	9						BP, 0°, CN, PR, S BP, 5°, CL VN, UN, S

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	292995.0 m E 6250260.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	55.90 m		
Barrel Type and Length:	3 m	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information							Rock Substance				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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL L M H VH EH 0.1 0.3 1 3 10	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
NMLC	75-100% Water RETURN	88	Is(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 BP, 5°, CN, CU, S
								LAMINITE: 70% SANDSTONE, 30% SILTSTONE, pale grey and yellow, slightly weathered, fine grained, thinly laminated				
			Is(50) d=0.34 a=1.65 MPa		43.9	12		Hole Terminated at 12.00 m Target depth				
					42.9	13						
					41.9	14						

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Mirvac **Elizabeth Enterprise Precinct** **1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH03** **(Core Photo 1 OF 1)**	
PSM3530-018R	**Appendix B**

Borehole ID

BH04

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293024.0 m E 6250430.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	55.30 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 3,7,9 N=16		54.3	1		CH	TOPSOIL: CLAY: high plasticity, brown, rootlets observed				0.20: INFERRED NATURAL
									CH	CLAY trace gravel: high plasticity, brown and grey, gravel is sub-angular up to 5 mm				
									CH	CLAY: high plasticity, grey and brown				
				SPT 1.50-1.95 m 4,11,14 N=25		53.3	2			Ironstone bands encountered between 1.6 m and 1.8 m	D			
AD/T		N		SPT 3.00-3.45 m 6,11,17 N=28 CBR 3.00-4.00 m		52.3	3		CH	CLAY: high plasticity, grey mottled red		VSt		
						51.3	4				D to M			
				SPT 4.50-4.95 m 8,11,22 HB N=33					CH	CLAY with gravel: high plasticity, grey mottled red, gravel is sub-angular up to 4 mm of siltstone origin		H		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293024.0 m E 6250430.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	55.30 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N							CH	CLAY with gravel: high plasticity, grey mottled red, gravel is sub-angular up to 4 mm of siltstone origin *(continued)*		H		
				SPT 6.00-6.30 m 6,31 HB N=R		49.3	6			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey	D to M			6.00: INFERRED BEDROCK
				SPT 7.50-7.80 m 6,37 HB N=R		48.3	7							
						47.3	8							
						46.3	9			Continued on cored borehole sheet				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293024.0 m E 6250430.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 55.30 m
Barrel Type and Length: 3 m Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information							Rock Substance					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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					49.3	6							
					48.3	7							
					47.3	8							
					46.3	9		Continued from non-cored borehole sheet					
NMLC		97	Is(50) d=0.27 a=0.12 MPa					SILTSTONE: grey and brown, highly weathered, thinly laminated Becomes moderately weathered					CZ

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	12/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	12/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293024.0 m E 6250430.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 | Inclination: -90° | RL Surface: 55.30 m
Barrel Type and Length: 3 m | Bearing: | Datum: AHD | Operator: Matrix Drilling

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, alteration)	Weathering (XW HW MW SW FR)	Strength Is(50) (● - Axial, ○ - Diametral) (VL 0.1 L 0.3 M 1 H 3 VH 10 EH)	Defect Spacing (mm) (<20 60 200 600 1000)	Defect Descriptions / Comments (Description, alpha/beta, infilling or coating, shape, roughness, thickness, other)
NMLC		97	Is(50) d=0.25 a=0.28 MPa					SILTSTONE: grey and brown, highly weathered, thinly laminated*(continued)*	HW	L	200–600	BP, 5°, CN, PR, S BP, 7°, CN, PR, S
					44.3	11		Hole Terminated at 10.65 m Target depth				
					43.3	12						
					42.3	13						
					41.3	14						

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Mirvac **Elizabeth Enterprise Precinct** **1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH04** **(Core Photo 1 OF 1)**	
PSM3530-018R	**Appendix B**

Borehole ID

BH05

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293049.0 m E 6250630.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	53.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 1,4,4 N=8		52.1	1		CH	TOPSOIL: CLAY: high plasticity, brown grey mottled red, rootlets observed	D to M	F		0.20: INFERRED NATURAL
									CH	CLAY: high plasticity, brown and grey				
				SPT 1.50-1.95 m 3,3,4 N=7		51.1	2							
				SPT 3.00-3.45 m 6,8,17 N=25		50.1	3			Becomes grey mottled red		VSt		
AD/T		N				49.1	4							
				SPT 4.50-4.95 m 11,15,20 N=35						Becomes grey mottled brown		H		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293049.0 m E 6250630.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	53.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N		SPT 6.00-6.12 m 17/120mm HB N=R		47.1	6		CH	CLAY: high plasticity, brown and grey *(continued)*		H		
										SILTSTONE: extremely to highly weathered, recovered as CLAY: high plastity, grey	D to M			6.00: INFERRED BEDROCK
						46.1	7							
										Continued on cored borehole sheet				
						45.1	8							
						44.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293049.0 m E 6250630.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 Inclination: -90° RL Surface: 53.10 m

Barrel Type and Length: 3 m Bearing: Datum: AHD Operator: Matrix Drilling

Drilling Information							Rock Substance				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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					47.1	6						
					46.1	7		Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	80	Is(50) d=0.06 a=0.06 MPa		45.1	8		SILTSTONE: grey and brown, highly weathered, thinly laminated Becomes moderately weathered				SM, CL, 60 mm SM, CL, 10 mm
		90	Is(50) d=0.11 a=0.15 MPa Is(50) d=0.09 a=0.15 MPa		44.1	9						BP, 5°, CL CO, PR, S, 5 mm

Method

AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube

WPT - Water pressure test

Water

Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss

Core recovered (hatching indicates material)
No core recovery

Weathering

XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength

VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type

FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating

CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness

SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape

PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293049.0 m E 6250630.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 — Inclination: -90° — RL Surface: 53.10 m
Barrel Type and Length: 3 m — Bearing: — Datum: AHD — Operator: Matrix Drilling

Method	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Strength Is(50)	Defect Spacing (mm)	Defect Descriptions / Comments
NMLC	75-100% Water RETURN	90	Is(50) d=0.32 a=0.3 MPa		42.1	11		SILTSTONE: grey and brown, highly weathered, thinly laminated *(continued)*	HW	L (axial)	1000	
					41.1 / 40.1 / 39.1	12 / 13 / 14		Hole Terminated at 11.10 m Target depth				

Column headers: Drilling Information (Method, Water, RQD (%), Samples and Field Tests, WPT (Lugeons), RL (m), Depth (m)); Rock Substance (Graphic Log; Material Description — ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration; Weathering XW HW MW SW FR; Strength Is(50) ● - Axial ○ - Diametral, VL 0.1 L 0.3 M 1 H 3 VH 10 EH); Rock Mass Defects (Defect Spacing (mm) <20 60 200 600 1000; Defect Descriptions / Comments — Description, alpha/beta, infilling or coating, shape, roughness, thickness, other).

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Mirvac **Elizabeth Enterprise Precinct** **1669-1723 Elizabeth Drive, Badgerys Creek CORE PHOTOS BH05** **(Core Photo 1 OF 1)**	
PSM3530-018R	**Appendix B**

Borehole ID

BH06

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293077.0 m E 6250847.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	51.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 3,9,8 N=17		50.1	1		CH	TOPSOIL: CLAY: high plasticity, brown and grey	D	VSt		0.20: INFERRED NATURAL
				SPT 1.50-1.95 m 2,2,2 N=4		49.1	2		CH	CLAY: high plasticity, brown and grey		F		
AD/T		N		SPT 3.00-3.30 m 3,11 HB N=R		48.1	3					H		
				SPT 4.50-4.95 m 2,10,23 HB N=33		47.1	4							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293077.0 m E 6250847.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	51.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N							CH	CLAY: high plasticity, brown and grey *(continued)*	D	H		
				SPT 6.00-6.40 m 2,27,7/100mm HB N=R		45.1	6			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey				6.00: INFERRED BEDROCK
										Continued on cored borehole sheet				
						44.1	7							
						43.1	8							
						42.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293077.0 m E 6250847.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	51.10 m		
Barrel Type and Length:	3 m	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information							***Rock Substance***				***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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					45.1	6		Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	70	Is(50) d=0.34 a=0.45 MPa		44.1	7		SILTSTONE: grey and brown, highly weathered				
					43.1	8		LAMINITE: 60% SANDSTONE, 40% SILTSTONE, grey, fine grained, moderately weathered, thinly to thickly laminated				BP, 0°, CN, PR, S
			Is(50) d=0.18 a=0.17 MPa									CZ, RF, 70 mm
		50	Is(50) d=0.16 a=0.11 MPa		42.1	9		Becomes 80% SILTSTONE, 20% SANDSTONE				BP, 0°, CL VN, PR, S BP, 5°, RF, PR, S, 15 mm BP, 10°, CL VN, PR, S BP, 5°, CL VN, PR, RF

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	13/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	13/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293077.0 m E 6250847.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting: Comacchio Geo 305 | Inclination: -90° | RL Surface: 51.10 m
Barrel Type and Length: 3 m | Bearing: | Datum: AHD | Operator: Matrix Drilling

Method	Water	RQD (%)	Samples and Field Tests	WPT (Lugeons)	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Strength Is(50)	Defect Spacing (mm)	Defect Descriptions / Comments
NMLC		50	Is(50) d=0.13 a=0.37 MPa					LAMINITE: 60% SANDSTONE, 40% SILTSTONE, grey, fine grained, moderately weathered, thinly to thickly laminated *(continued)* Becomes slightly weathered	MW → SW	M	1000	
					40.1	11		Hole Terminated at 10.70 m Target depth				
					39.1	12						
					38.1	13						
					37.1	14						

Strength: ● - Axial, ○ - Diametral; VL 0.1 L 0.3 M 1 H 3 VH 10 EH
Weathering: XW HW MW SW FR
Defect Spacing: <20 60 200 600 1000

Material Description: ROCK NAME: particle/grain characteristics, colour, fabric/texture, inclusions or minor components, moisture, mineral composition, alteration
Defect Descriptions / Comments: Description, alpha/beta, infilling or coating, shape, roughness, thickness, other

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Mirvac	
Elizabeth Enterprise Precinct	
1669-1723 Elizabeth Drive, Badgerys Creek	
CORE PHOTOS BH06	
(Core Photo 1 OF 1)	
PSM3530-018R	**Appendix B**

Borehole ID

BH07

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293098.0 m E 6250996.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description				Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 3,5,7 N=12		47.1	1		CH	TOPSOIL: CLAY: high plasticity, brown, rootlets observed	M	St		0.15: INFERRED NATURAL
									CH	CLAY: high plasticity, brown and grey				
				SPT 1.50-1.95 m 5,10,11 N=21		46.1	2			Becomes grey mottled red Ironstone band encountered	D to M			
				SPT 3.00-3.45 m 7,9,15 HB N=24		45.1	3					VSt		
AD/T		N				44.1	4							
				SPT 4.50-4.65 m 18 HB N=R						SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, dark grey				4.50: INFERRED BEDROCK

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293098.0 m E 6250996.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N		SPT 6.00-6.15 m 18 HB N=R		42.1	6			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, dark grey *(continued)*	D to M			
						41.1	7			Continued on cored borehole sheet				
						40.1	8							
						39.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293098.0 m E 6250996.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m		
Barrel Type and Length:	3 m	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information							***Rock Substance***				***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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
					42.1	6		Continued from non-cored borehole sheet				
NMLC	75-100% Water RETURN	63	Is(50) d=2.87 a=3.62 MPa		41.1	7		SILTSTONE: grey and brown, highly weathered, thinly laminated Becomes moderately weathered				BP, 5°, CL VN, PR, S
					40.1	8		LAMINITE: 70% SANDSTONE, 30% SILTSTONE, pale yellow and grey, fine to medium grained, moderately weathered, thinly laminated				BP, 5°, CL CO, PR, RF BP, 10°, CL CO, PR, S
		87	Is(50) d=0.48 a=0.98 MPa		39.1	9						BP, 10°, CL VN, UN, RF SM, CL, 20 mm
			Is(50) d=0.19 a=0.38 MPa					Becomes 80% SILTSTONE, 20% SANDSTONE and slightly weathered				BP, 5°, CL CO, PR, RF BP, 5°, CL VN, PR, RF BP, 5°, CL VN, PR, S

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293098.0 m E 6250996.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m	
Barrel Type and Length:	3 m	Bearing:		Datum:	AHD	Operator: Matrix Drilling

Drilling Information							***Rock Substance***			***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, alteration	Weathering XW HW MW SW FR	Strength Is(50) ● - Axial ○ - Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
NMLC		87	Is(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*(continued)*				
					37.1	11		Hole Terminated at 10.50 m Target depth				
					36.1	12						
					35.1	13						
					34.1	14						

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube
WPT - Water pressure test

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

Weathering
XW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
FR - Fresh

Strength
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

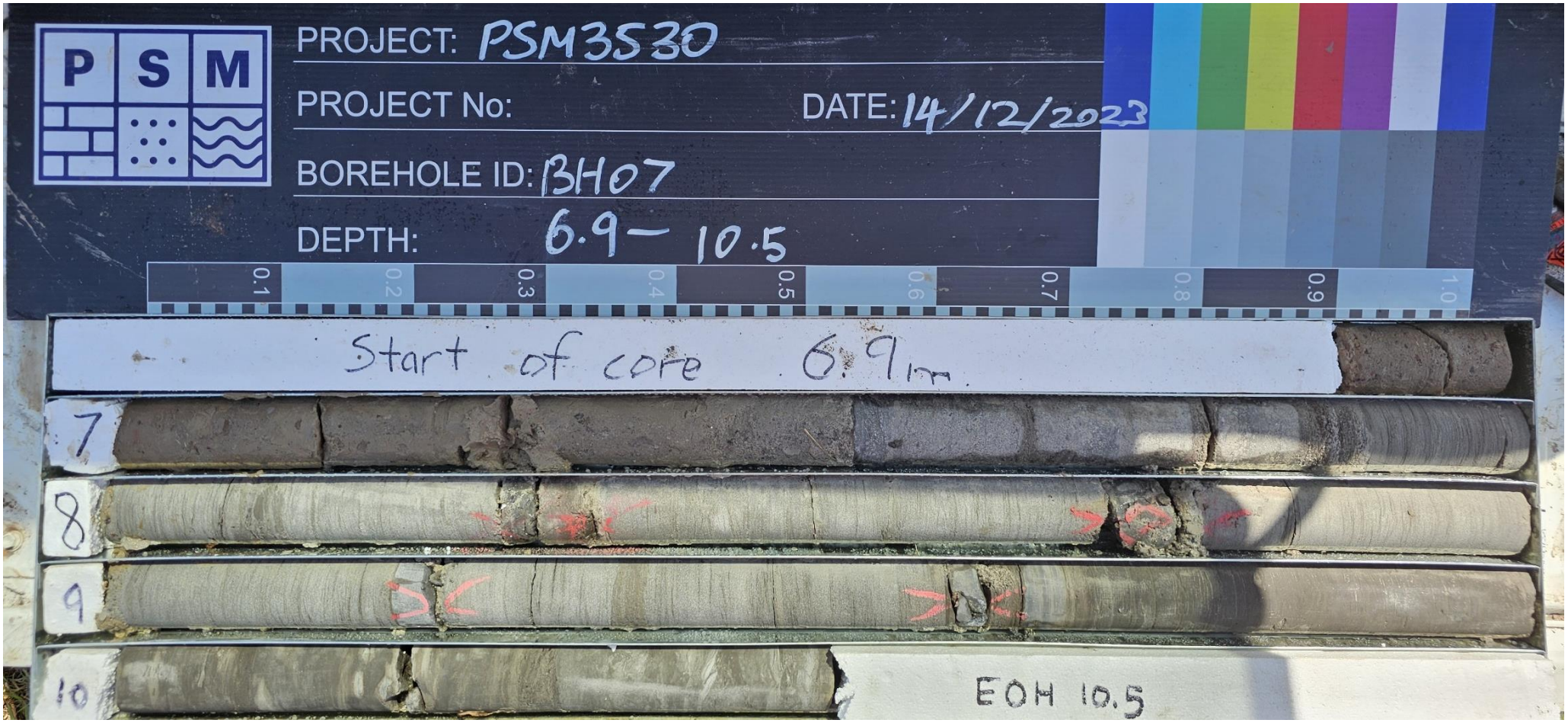
Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

Logged in accordance with AS 1726:2017 Geotechnical site investigations



Mirvac	
Elizabeth Enterprise Precinct	
1669-1723 Elizabeth Drive, Badgerys Creek	
CORE PHOTOS BH07	
(Core Photo 1 OF 1)	
PSM3530-018R	**Appendix B**

Borehole ID

BH08

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293240.0 m E 6250973.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.80 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 6,10,12 N=22 CBR 0.50-1.00 m		39.8	1		CH	TOPSOIL: CLAY: high plasticity, brown, rootlets observed				
									CH	CLAY: high plasticity, brown mottled red				0.20: INFERRED NATURAL
				SPT 1.50-1.95 m 4,10,10 N=20 ES 1.50 m		38.8	2			Becomes brown grey	D	VSt		
AD/T		N		SPT 3.00-3.45 m 3,8,15 N=23		37.8	3							
						36.8	4							
				SPT 4.50-4.73 m 11,13/80mm HB N=R						SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, dark grey				4.50: INFERRED BEDROCK

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293240.0 m E 6250973.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.80 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description				Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered			34.8	6			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, dark grey *(continued)*	D		
										Hole Terminated at 6.00 m Target depth			
						33.8	7						
						32.8	8						
						31.8	9						

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH09

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293277.0 m E 6250822.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CH	TOPSOIL: CLAY: high plasticity, brown, rootlets observed				0.15: INFERRED FILL
									CH	CLAY: high plasticity, brown mottled red				
				SPT 0.50-0.95 m 9,14,23 HB N=37								H		
						39.9	1							
				SPT 1.50-1.95 m 10,11,14 N=25							D			
						38.9	2					VSt		
AD/T		N	Not Encountered						CH	CLAY: high plasticity, brown grey				2.50: INFERRED NATURAL
				SPT 3.00-3.45 m 4,5,6 N=11		37.9	3							
						36.9	4				M	St		
				SPT 4.50-4.95 m 4,5,6 N=11										

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	14/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	14/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293277.0 m E 6250822.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered						CH	CLAY: high plasticity, brown grey *(continued)*	M	St		
				SPT 6.00-6.24 m 17,20/90mm HB N=R		34.9	6							6.00: INFERRED BEDROCK
										Hole Terminated at 6.24 m Target depth				
						33.9	7							
						32.9	8							
						31.9	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH10

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 9,9,12 N=21		40.7	1		CI	CLAY: medium plasticity, pale brown	D	F to St		0.00: INFERRED FILL
									CI-CH	Gravelly CLAY: medium to high plasticity, brown and dark grey, gravel is sub-angular to sub-rounded up to 5 mm	D to M			
				SPT 1.50-1.95 m 8,8,16 N=24 ES 1.50 m		39.7	2			Gravelly CLAY: medium plasticity, dark grey and grey, gravel is angular to sub-angular up to 30 mm, SHALE origin				
AD/T		N		SPT 3.00-3.45 m 6,20,11 N=31		38.7	3		CI	Gravelly CLAY: medium plasticity, dark grey and grey, gravel is sub-rounded up to 20 mm	D	VSt		
						37.7	4		CH	CLAY: high plasticity, brown mottled red, ironstained	M			3.50: INFERRED NATURAL
				SPT 4.50-4.95 m 3,4,5 N=9						Becomes pale grey mottled brown		St		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered						CH	CLAY: high plasticity, brown mottled red, ironstained *(continued)*	M	St		
				SPT 6.00-6.45 m 5,8,11 N=19		35.7	6			Ironstone gravels observed	M to W	VSt		6.00: Water observed in SPT sample
						34.7	7			Hole Terminated at 6.45 m Target depth				
						33.7	8							
						32.7	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH11

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293546.0 m E 6250698.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 9,9,11 N=20		40.1	1		CI	CLAY with gravel: medium plasticity, grey, gravel is sub-rounded to rounded up to 10 mm		St	0.00: INFERRED FILL
										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	D to M		
AD/T		N		SPT 3.00-3.45 m 5,7,9 N=16		38.1	3		CH	CLAY: high plasticity, brown and red mottled dark brown, ironstained		VSt	3.00: INFERRED NATURAL
						37.1	4				M		
				SPT 4.50-4.95 m 3,3,8 N=11								St	
										Ironstone gravels observed			

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293546.0 m E 6250698.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	▽	SPT 6.00-6.45 m 9,19,22 N=41		35.1	6		CH	CLAY: high plasticity, brown and red mottled dark brown, ironstained *(continued)*	M W	St H		
						34.1	7			Hole Terminated at 6.45 m Target depth				
						33.1	8							
						32.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
▽ Inflow
◁ Partial Loss
◀ Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH12

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293323.0 m E 6250581.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	43.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CI	CLAY trace gravel: medium plasticity, pale grey mottled yellow brown, gravel is up to 5 mm of siltstone origin	D	St		0.00: INFERRED FILL
				SPT 0.50-0.81 m 12,23,3/10mm HB N=R		42.1	1		GC	Gravelly CLAY: medium plasticity, dark grey and grey, gravel is angular up to 30 mm of siltstone origin	D	H		
				SPT 1.50-1.90 m 13,16,20/100mm HB N=R		41.1	2			Ironstone gravel observed, rounded and up to 30 mm				
AD/T		N	Not Encountered						GC	GRAVEL with clay: pale to dark grey, sub-angular to sub-rounded up to 40 mm, of siltstone and sandstone origin, clay is medium plasticity				
				SPT 3.00-3.45 m 7,14,16 N=30		40.1	3				M	D		
						39.1	4		CH	CLAY: high plasticity, brown and red mottled dark grey, ironstained				4.20: INFERRED NATURAL
				SPT 4.50-4.95 m 5,6,10 N=16							M	St to VSt		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293323.0 m E 6250581.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	43.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 2,2,3 N=5		37.1	6		CH	CLAY: high plasticity, brown and red mottled dark grey, ironstained *(continued)*	M	St to VSt		
										Becomes pale grey mottled brown	M to W	F		
				SPT 7.50-7.95 m 5,4,8 N=12		36.1	7					St		
						35.1	8			Sandy CLAY: high plasticity, dark yellow, sand is medium to coarse grained				
										Hole Terminated at 8.00 m Target depth				
						34.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH13

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Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293521.0 m E 6250479.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.80 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information							Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 10,6,7 N=13 ES 0.50 m		39.8	1		CI	CLAY with gravel: medium plasticity, brown and yellow, gravel is sub-rounded up to 20 mm	D to M			0.00: INFERRED FILL
									CH	CLAY: high plasticity, pale grey mottled red, iron stained		St		0.70: INFERRED NATURAL
AD/T		N		SPT 1.50-1.95 m 3,9,14 N=23 ES 1.50 m		38.8	2				M	VSt to H		1.50: Ironstone gravels observed within SPT sample
				SPT 3.00-3.19 m 7,22/40mm HB N=R		37.8	3			SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey				3.00: INFERRED BEDROCK
						36.8	4			Hole Terminated at 3.20 m Refusal				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH14

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293360.0 m E 6250492.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	42.50 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							GC	Gravelly CLAY: medium to high plasticity, brown and dark grey, gravel is angular to sub-angular, up to 30 mm.				0.00: INFERRED FILL
				SPT 0.50-0.95 m 3,11,28 N=39						Becomes dark grey				
						41.5	1				D	VSt to H		
				SPT 1.50-1.95 m 10,13,16 N=29										1.50: SILTSTONE fragment observed within SPT sample
AD/T		N				40.5	2							
									CI-CH	CLAY with gravel: medium to high plasticity, brown, red and yellow, gravel is sub-angular up to 5 mm, trace sandstone fragments				
				SPT 3.00-3.45 m 4,8,10 N=18		39.5	3							
						38.5	4				M	VSt		4.0: INFERRED NATURAL
									CH	CLAY: high plasticity, brown mottled red, ironstained				
				SPT 4.50-4.95 m 7,9,14 N=23						Becomes pale grey and yellow				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293360.0 m E 6250492.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	42.50 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N		SPT 6.00-6.45 m 3,4,5 N=9		36.5	6		CH	CLAY: high plasticity, brown mottled red, ironstained *(continued)*	M	VSt		
										Becomes brown	M to W	St		
						35.5	7			Hole Terminated at 6.45 m Target depth				
						34.5	8							
						33.5	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH15

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Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293296.0 m E 6250400.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	43.20 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 6,10,13 N=23		42.2	1		CI	TOPSOIL: Silty CLAY: medium plasticity, yellow and brown, rootlets	M	VSt		0.20: INFERRED NATURAL
				ES 0.95 m					CH	CLAY: high plasticity, dark brown mottled red, ironstained				
AD/T		N		SPT 1.50-1.95 m 6,9,16 N=25		41.2	2		CH	CLAY: high plasticity, brown and red, ironstained				
				SPT 3.00-3.45 m 6,14,14 N=28		40.2	3		CH	Sandy CLAY: high plasticity, pale grey and grey, sand is fine grained	D to M			
				SPT 4.50-4.73 m 17,18/80mm HB N=R		39.2	4			SILTSTONE: dark grey, low to medium strength, slighly weathered				4.50: INFERRED BEDROCK
										Hole Terminated at 4.70 m Refusal				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH16

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293496.0 m E 6250403.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.00 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CI	TOPSOIL: CLAY: medium plasticity, brown, rootlets	D to M	F		
										Clayey GRAVEL: dark grey and grey, sub-angular to sub-rounded, up to 35 mm, clay is medium plasticity				0.20: INFERRED FILL
				SPT 0.50-0.95 m 10,13,14 N=27 CBR 0.50-1.50 m		39.0	1				D	D		
				SPT 1.50-1.95 m 3,3,6 N=9		38.0	2		CH	CLAY: high plasticity, brown mottled pale brown				1.50: INFERRED NATURAL
AD/T		N		SPT 3.00-3.45 m 2,4,5 N=9		37.0	3				M	St		
						36.0	4			Becomes pale grey mottled brown				
				SPT 4.50-4.95 m 4,3,4 N=7										4.50: Ironstone gravel observed in SPT sample

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293496.0 m E 6250403.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	40.00 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	▽						CH	CLAY: high plasticity, brown mottled pale brown *(continued)*	M	St		
				SPT 6.00-6.45 m 5,6,10 N=16		34.0	6		CH	CLAY: high plasticity, pale grey mottled dark grey	M to W	VSt to H		
			▽	SPT 7.50-7.95 m 12,17,35 N=52		33.0	7		CH	CLAY: high plasticity, dark brown, ironstained, trace sandstone fragments and ironstone gravel	W			
						32.0	8			SILTSTONE: dark grey and grey, very low strength, slighly weathered				7.80: INFERRED BEDROCK
										Hole Terminated at 7.95 m Target depth				
						31.0	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
▽ Inflow
◁ Partial Loss
◀ Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH17

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293475.0 m E 6250299.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CI	TOPSOIL: CLAY: medium plasticity, brown	D to M	F		
									GC	Clayey GRAVEL: dark grey and grey, sub-angular to sub-rounded, up to 30 mm, clay is medium plasticity				0.20: INFERRED FILL
				SPT 0.50-0.95 m 3,9,6 N=15		40.6	1				D	MD		
				SPT 1.50-1.95 m 1,4,9 N=13		39.6	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	M	St		
AD/T		N	Not Encountered	SPT 3.00-3.45 m 2,3,4 N=7		38.6	3		CH	CLAY: high plasticity, pale brown to brown mottled grey				3.00: INFERRED NATURAL
						37.6	4				M	F		
				SPT 4.50-4.95 m 3,3,4 N=7										4.50: Ironstone gravels observed in SPT sample

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293475.0 m E 6250299.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 6,6,7 N=13		35.6	6		CH	CLAY: high plasticity, pale brown to brown mottled grey *(continued)*	M	F St		
						34.6	7			Hole Terminated at 6.45 m Target depth				
						33.6	8							
						32.6	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH18

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Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	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:	293343.0 m E 6250308.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	42.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 2,4,5 N=9		41.9	1		CI	TOPSOIL: Silty CLAY: medium plasticity, brown and yellow, rootlets				
									CH	CLAY: high plasticity, dark brown mottled red, minor ironstaining				0.20: INFERRED NATURAL
				SPT 1.50-1.95 m 5,9,11 N=20		40.9	2			Becomes pale grey and dark grey	M	St		
AD/T		N		SPT 3.00-3.45 m 5,11,14 N=25		39.9	3				D to M	VSt		
						38.9	4							
				SPT 4.50-4.83 m 9,23,25/30mm N=R						SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey and dark grey Hole Terminated at 4.87 m Refusal				4.50: INFERRED BEDROCK

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH19

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293054.0 m E 6250211.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	52.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 4,5,8 N=13					CL CL-CI	TOPSOIL: CLAY trace sand: low plasticity, dark brown, sand is fine grained, rootlets observed	D to M			0.05: INFERRED FILL
										CLAY trace sand and gravel: low to medium plasticity, orange and red, sand is fine grained, gravel is sub-angular up to 10 mm	D to M			
									CH	CLAY: high plasticity, pale grey mottled red		F to St		0.60: INFERRED NATURAL
				ES 1.00 m		51.6	1							
										Becomes pale grey and pale yellow				
				SPT 1.50-1.95 m 6,11,12 N=23										
						50.6	2			Becomes pale grey and brown				
											M	VSt		
				SPT 3.00-3.45 m 8,10,13 N=23		49.6	3							
				SPT 4.00-4.45 m 5,7,12 N=19		48.6	4							
AD/T		N												

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293054.0 m E 6250211.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	52.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered			46.6	6		CH	CLAY: high plasticity, pale grey mottled red *(continued)*	M	VSt		
										Hole Terminated at 6.00 m Target depth				
						45.6	7							
						44.6	8							
						43.6	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH20

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Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293267.0 m E 6250204.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	49.30 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 3,4,6 N=10		48.3	1		CH	TOPSOIL: CLAY: high plasticity, brown and dark brown, rootlets	M	F		
									CH	CLAY: high plasticity, brown mottled red, ironstained				0.20: INFERRED NATURAL
AD/T				SPT 1.50-1.95 m 9,6,8 N=14		47.3	2					St		
		N		SPT 3.00-3.45 m 1,6,12 N=18		46.3	3					VSt		
						45.3	4							
				SPT 4.50-4.85 m 10,22,8/50mm N=R					CH	SILTSTONE: extremely weathered, recovered as CLAY: high plasticity, grey and brown				4.50: INFERRED BEDROCK
										Hole Terminated at 4.80 m Refusal				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH21

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Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293324.0 m E 6250175.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	46.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							CH	CLAY with gravel: high plasticity, grey and brown, gravel is sub-angular up to 5 mm				0.00: INFERRED FILL
				SPT 0.50-0.95 m 9,17,16 N=33		45.1	1				D to M	H		
										Becomes brown and red				
				SPT 1.50-1.95 m 4,9,11 N=20 CBR 1.50-2.50 m		44.1	2		CH	CLAY: high plasticity, brown				1.50: INFERRED NATURAL
AD/T		N	Not Encountered											
				SPT 3.00-3.45 m 8,12,16 N=28		43.1	3				M	VSt to H		
						42.1	4							
				SPT 4.50-4.92 m 8,17,20/120mm HB N=R					CH	SILTSTONE: extremely weathered recovered as CLAY: high plasticity, pale grey Hole Terminated at 4.92 m Refusal				4.50: INFERRED BEDROCK

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH22

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293592.0 m E 6250172.0 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	Operator:	Matrix Drilling

Drilling Information								Soil Description				Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 11,12,11 N=23		40.7	1		GC	Gravelly CLAY: medium plasticity, grey, gravel is sub-angular to sub-rounded up to 30 mm of siltstone origin	D	St to VSt		0.00: INFERRED FILL
AD/T				SPT 1.50-1.95 m 6,6,7 N=13 ES 1.50 m		39.7	2							
				SPT 3.00-3.45 m 3,4,4 N=8		38.7	3		CH	CLAY: high plasticity, grey mottled brown	M	St		3.00: INFERRED NATURAL
				SPT 4.50-4.95 m 4,5,6 N=11		37.7	4		CH	CLAY trace gravel: high plasticity, pale grey mottled yellow brown, gravel is angular up to 20 mm				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293592.0 m E 6250172.0 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	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T			Not Encountered						CH	CLAY trace gravel: high plasticity, pale grey mottled yellow brown, gravel is angular up to 20 mm *(continued)*	M	St		
				SPT 6.00-6.35 m 4,16,25/50mm HB N=R		35.7	6			SILTSTONE: pale grey, moderately to slightly weathered, very low strength				6.00: INFERRED BEDROCK
						34.7	7			Hole Terminated at 6.35 m Target depth				
						33.7	8							
						32.7	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH23

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293726.0 m E 6250077.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N							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 0.50-0.95 m 5,7,12 N=19		40.6	1							
AD/T		N	Not Encountered	SPT 1.50-1.95 m 18,20,16 N=36		39.6	2				D to M	VSt to H		
				SPT 3.00-3.45 m 4,5,7 N=12		38.6	3		CH	CLAY: high plasticity, grey mottled brown				3.00: INFERRED NATURAL
				SPT 4.50-4.95 m 4,3,5 N=8		37.6	4				M	St		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293726.0 m E 6250077.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	41.60 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 6,9,15 N=24		35.6	6		CH	CLAY: high plasticity, grey mottled brown *(continued)*	M	St		6.40: Ironstone gravel observed
						34.6	7					VSt		
						33.6	8							
						32.6	9			Hole Terminated at 8.20 m Target depth				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH24

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293723.0 m E 6249987.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	42.20 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.15-0.60 m 7,13,9 N=22		41.2	1		CI	Gravelly CLAY: medium plasticity, grey, gravel is sub-angular to sub-rounded up to 30 mm of siltstone origin				0.00: INFERRED FILL
				SPT 1.50-1.84 m 5,5,10/40mm HB N=R		40.2	2			Becomes grey mottled brown	D to M	VSt to H		
AD/T		N	Not Encountered	SPT 3.00-3.45 m 4,6,7 N=13		39.2	3		CH	CLAY: high plasticity, grey mottled brown, trace rootlets				3.00: INFERRED NATURAL
						38.2	4				M	St		
				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		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293723.0 m E 6249987.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	42.20 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 7,11,14 N=25		36.2	6		CH	Sandy CLAY: high plasticity, brown and grey, sand is fine to medium grained *(continued)*	M	VSt		
						35.2	7			Hole Terminated at 6.45 m Target depth				
						34.2	8							
						33.2	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH25

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293568.0 m E 6250006.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	43.30 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N		SPT 0.50-0.95 m 6,22,29 N=51		42.3	1		CI	Gravelly CLAY: medium plasticity, grey, gravel is sub-angular to sub-rounded up to 30 mm of siltstone origin	D to M	VSt to H		0.00: INFERRED FILL
				SPT 1.50-1.95 m 13,7,8 N=15		41.3	2							
AD/T		N	Not Encountered	SPT 3.00-3.45 m 3,3,6 N=9		40.3	3		CH	CLAY: high plasticity, brown and yellow mottled grey, trace rootlets				3.00: INFERRED NATURAL
						39.3	4			Becomes yellow mottled pale grey	M	St		
				SPT 4.50-4.95 m 2,5,12 N=17					CH	Sandy CLAY: high plasticity, brown and grey, sand is fine to medium grained		VSt		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH25

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	19/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	19/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293568.0 m E 6250006.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	43.30 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 12,13,10 N=23		37.3	6		CH	Sandy CLAY: high plasticity, brown and grey, sand is fine to medium grained *(continued)*	M	VSt		
						36.3	7			Hole Terminated at 6.45 m Target depth				
						35.3	8							
						34.3	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH26

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293446.0 m E 6250026.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	44.70 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 0.50-0.95 m 3,5,9 N=14		43.7	1		CI-CH	CLAY trace gravel: medium to high plasticity, brown, gravel up to 5 mm	M	St		0.00: INFERRED FILL
				SPT 1.50-1.95 m 6,7,8 N=15		42.7	2		CH	CLAY: high plasticity, brown mottled grey				0.70: INFERRED NATURAL
				SPT 3.00-3.45 m 3,5,8 N=13		41.7	3			Becomes pale grey mottled yellow				
						40.7	4			Becomes pale brown				
				SPT 4.50-4.95 m 4,6,9 N=15										

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293446.0 m E 6250026.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	44.70 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 4,5,9 N=14		38.7	6		CH	CLAY: high plasticity, brown mottled grey *(continued)*	M	St		
						37.7	7			Hole Terminated at 6.45 m Target depth				
						36.7	8							
						35.7	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH27

Page 1 of 2

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293379.0 m E 6250040.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	45.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered						CI	Gravelly CLAY: medium plasticity, brown, gravel is sub-angular to sub-rounded up to 30 mm	D to M			0.00: INFERRED FILL
				SPT 0.50-0.95 m 8,12,12 N=24		44.9	1		CH	CLAY: high plasticity, brown and yellow		VSt		
				SPT 1.50-1.95 m 7,7,6 N=13 ES 1.50 m		43.9	2		CI-CH	Sandy Gravelly CLAY: medium to high plasticity, dark brown and red, sand is fine grained, gravel is sub-angular to sub-rounded up to 5 mm				
									CH	CLAY: high plasticity, pale grey mottled brown	M			2.00: INFERRED NATURAL
				SPT 3.00-3.45 m 4,6,10 N=16		42.9	3					St to VSt		
						41.9	4							
				SPT 4.50-4.95 m 4,5,8 N=13										

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	20/12/2023
Project Name:	Elizabeth Enterprise Precinct	Completed:	20/12/2023
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	KQ
Hole Position:	293379.0 m E 6250040.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	45.90 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 6.00-6.45 m 7,9,13 N=22		39.9	6		CH	CLAY: high plasticity, pale grey mottled brown *(continued)*	M	St to VSt		
						38.9	7			Hole Terminated at 6.45 m Target depth				
						37.9	8							
						36.9	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH28

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
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	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered	SPT 0.50-0.95 m 11,13,10 N=23		48.6	1		CL CH	TOPSOIL: CLAY with gravel and sand: low plasticity, dark brown, sand is fine grained, gravel is sub-angular up to 10 mm, rootlets observed CLAY: medium to high plasticity, pale grey mottled yellow, iron stained	M			0.15: INFERRED NATURAL
				SPT 1.00-1.45 m 10,14,10 N=24 CBR 1.00-3.50 m		47.6	2			Becomes pale grey mottled orange	M	VSt		
				ES 2.50 m		46.6	3		CH	CLAY: high plasticity, pale grey and pale red				
				SPT 3.00-3.45 m 12,17,14 N=31		45.6	4			Becomes pale grey mottled yellow	D to M	H		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
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	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered						CH	CLAY: high plasticity, pale grey and pale red *(continued)*	D to M	H		
						43.6	6			Hole Terminated at 6.00 m Target depth				
						42.6	7							
						41.6	8							
						40.6	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH29

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
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	Operator:	Matrix Drilling

Drilling Information								Soil Description				Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 4,9,9 N=18		55.9	1		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 M			0.10: INFERRED NATURAL
				SPT 1.50-1.95 m 3,7,11 N=18		54.9	2			Becomes orange and brown	D to M			
				SPT 3.00-3.45 m 5,9,8 N=17		53.9	3			Becomes pale grey mottled red	M	VSt		
				SPT 4.00-4.45 m 9,14,19 N=33		52.9	4			Becomes pale red and pale grey		H		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
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	Operator:	Matrix Drilling

Drilling Information							Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered			50.9	6		CH	CLAY: high plasticity, pale grey mottled yellow *(continued)*	M	H		
						49.9	7			Hole Terminated at 6.00 m Target depth				
						48.9	8							
						47.9	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH30

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293245.0 m E 6249983.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	53.50 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 7,8,8 N=16					CL-CI	TOPSOIL: CLAY trace sand: low to medium plasticity, orange and brown, sand is fine grained, rootlets observed	M			0.15: INFERRED NATURAL
									CH	CLAY: high plasticity, pale grey, ironstained				
				ES 1.00 m		52.5	1			Becomes pale grey mottled red	D	St to VSt		
				SPT 1.50-1.95 m 7,10,5 N=15		51.5	2		CH	CLAY: high plasticity, pale grey and yellow brown	M			
AD/T		N		SPT 3.00-3.45 m 3,12,10 N=22		50.5	3		CI-CH	CLAY: medium to high plasticity, dark grey, ironstained	M	VSt		
						49.5	4		CH	SILTSTONE: extremely weathered recovered as CLAY: high plasticity, grey and brown				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293245.0 m E 6249983.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	53.50 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/T		N	Not Encountered			47.5	6		CH	SILTSTONE: extremely weathered recovered as CLAY: high plasticity, grey and brown *(continued)*	M	VSt		
						46.5	7							
										Hole Terminated at 7.50 m Target depth				
						45.5	8							
						44.5	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH31

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293156.0 m E 6249842.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	46.40 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 6,7,9 N=16					CH	TOPSOIL: CLAY: high plasticity, dark brown, rootlets				
									CH	CLAY: high plasticity, dark brown				0.25: INFERRED NATURAL
				CBR 1.00-3.50 m		45.4	1			Becomes red and brown	D			
				SPT 1.50-1.95 m 5,11,14 N=25						Ironstone band observed				
						44.4	2					VSt		
				SPT 3.00-3.45 m 4,8,11 N=19		43.4	3			Becomes grey	D to M			
						42.4	4			CLAY is weakly laminated				
				SPT 4.50-4.95 m 5,9,11 N=20										

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293156.0 m E 6249842.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	46.40 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 6.00-6.45 m 6,9,12 N=21		40.4	6		CH	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							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH32

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293067.0 m E 6249859.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description				Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 3,4,6 N=10		47.1	1		CH	TOPSOIL: CLAY: high plasticity, dark brown, rootlets				
									CH	CLAY: high plasticity, dark brown				0.20: INFERRED NATURAL
										Becomes orange and grey	D			
				SPT 1.50-1.95 m 3,5,5 N=10		46.1	2					St		
										Becomes grey				
				SPT 3.00-3.45 m 4,5,11 N=16		45.1	3				D to M			
										Becomes red and brown trace ironstone gravel				
						44.1	4					VSt		
				SPT 4.50-4.95 m 5,8,11 N=19						Becomes grey and brown				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293067.0 m E 6249859.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	48.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information							Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered						CH	CLAY: high plasticity, dark brown *(continued)*	D to M	VSt		
				SPT 6.00-6.45 m 10,16,23 HB N=39		42.1	6			Gravelly CLAY: high plasticity, grey, gravel is sub-angular up to 20 mm of SILTSTONE origin		H		
										Hole Terminated at 6.45 m Target depth				
						41.1	7							
						40.1	8							
						39.1	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH33

Page 1 of 1

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293530.0 m E 6249773.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	58.10 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	ES 0.20 m SPT 0.50-0.95 m 4,7,11 N=18 SPT 1.50-1.95 m 11,9,10 N=19		57.1 56.1	1 2		CI CH CH	TOPSOIL: CLAY trace sand: medium plasticity, dark brown, sand is fine grained, rootlets observed CLAY with gravel trace sand: high plasticity, orange red mottled grey, gravel is sub-angular up to 2 mm, sand is fine grained CLAY trace sand: high plasticity, pale yellow mottled orange, sand is fine grained	D to M M	VSt		0.15: INFERRED NATURAL
AD/T		N				55.1 54.1	3 4			SILTSTONE: dark brown to pale brown, very low strength, highly weathered, medium strength fragments observed Becomes pale grey and pale brown	D to M			2.20: INFERRED BEDROCK
										Hole Terminated at 4.60 m Refusal				

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
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

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH34

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293511.0 m E 6249615.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	60.80 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 2,2,4 N=6		59.8	1		CI-CH CH	TOPSOIL: CLAY trace gravel and sand: medium to high plasticity, dark brown to red and brown, sand is fine grained, gravel is sub-angular up to 3 mm CLAY trace sand: high plasticity, pale grey mottled red, sand is fine grained, ironstained	M	F		0.20: INFERRED NATURAL
				SPT 1.50-1.95 m 3,4,7 N=11		58.8	2					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		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
D - Dry
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Consistency/Relative Density
VS - Very soft
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VL - Very loose
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MD - Medium dense
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VD - Very dense
Ce - Cemented
C - Compact

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

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:	BG
Hole Position:	293511.0 m E 6249615.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	60.80 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered						CH	CLAY trace sand: high plasticity, pale grey mottled red, sand is fine grained, ironstained *(continued)*	M	VSt		
				SPT 6.00-6.45 m 5,10,20 N=30		54.8	6		CH	CLAY: high plasticity, pale grey mottled red, ironstained		H		
						53.8	7			Hole Terminated at 6.50 m Target depth				
						52.8	8							
						51.8	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
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SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Moisture Condition
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Consistency/Relative Density
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F - Firm
St - Stiff
VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
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VD - Very dense
Ce - Cemented
C - Compact

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Borehole ID

BH35

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293031.0 m E 6249559.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	63.00 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 0.50-0.95 m 4,5,5 N=10		62.0	1		CH	TOPSOIL: CLAY: high plasticity, dark brown, rootlets				
									CH	CLAY: high plasticity, red and brown				0.20: INFERRED NATURAL
										Becomes grey and red				
				SPT 1.50-1.95 m 3,4,4 N=8		61.0	2				D	F to St		
				SPT 3.00-3.45 m 5,7,9 N=16		60.0	3					VSt		
						59.0	4				D to M			
				SPT 4.50-4.76 m 39,55/110mm HB N=R								H		

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
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Ce - Cemented
C - Compact

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Engineering Log - Non Cored Borehole

Project No.: PSM3530

Client:	Mirvac	Commenced:	08/01/2024
Project Name:	Elizabeth Enterprise Precinct	Completed:	08/01/2024
Hole Location:	Refer to PSM3530-018R Figure 1	Logged By:	JBL
Hole Position:	293031.0 m E 6249559.0 m N MGA2020 Zone 56	Checked By:	AS

Drill Model and Mounting:	Comacchio Geo 305	Inclination:	-90°	RL Surface:	63.00 m		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Matrix Drilling

Drilling Information								Soil Description					Observations
Method	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 Penetrometer UCS (kPa) 100 200 300 400 500	Structure, Zoning, Origin, Additional Observations
AD/V		N	Not Encountered	SPT 6.00-6.45 m 9,17,20 N=37		57.0	6		CH	CLAY: high plasticity, red and brown *(continued)* Becomes brown and grey	D to M	H		
						56.0	7			Hole Terminated at 6.45 m Target depth				
						55.0	8							
						54.0	9							

Method
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 long 76mm diameter

Penetration
No resistance
Refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
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H - Hard
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L - Loose
MD - Medium dense
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Ce - Cemented
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Logged in accordance with AS 1726:2017 Geotechnical site investigations

Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

JOB no.: PSM3530

PROJECT: EEP

PIEZOMETER CONSTRUCTION RECORD

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

Tick boxes

Steel protective well cover ☐

PVC cap ☑

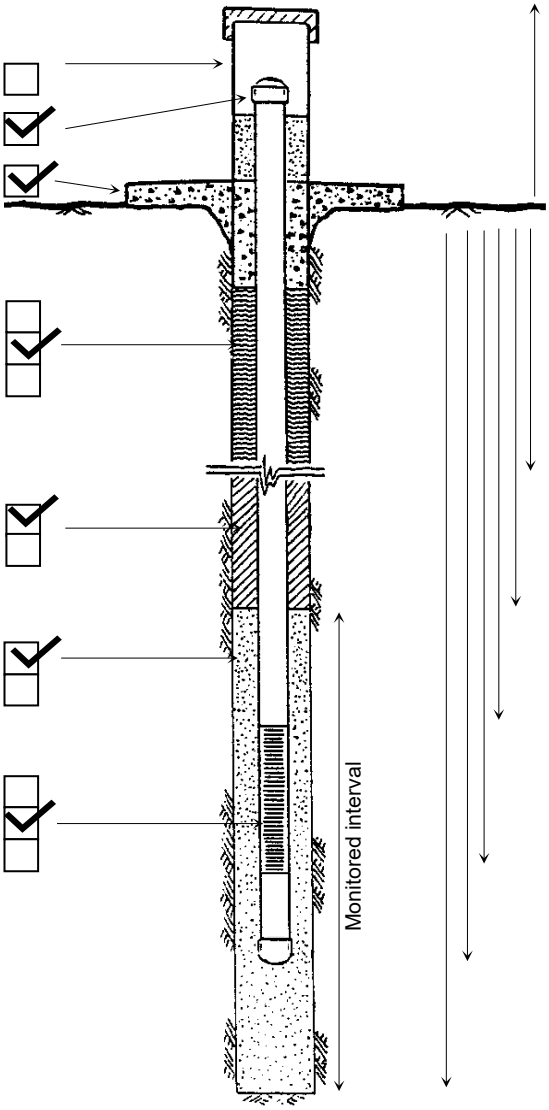
Concrete colar ☑

Back fill type:
Cement bentonite ☐
Soil ☑
None ☐

Seal:
Bentonite pellets ☑
Other ☐

Gravel type:
2-5mm gravel ☑
Other ☐

Perforation type:
Drill holes ☐
Hack saw cuts ☑
40um machine slots ☐



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

Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

JOB no.: PSM3530

PROJECT: 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

Steel protective well cover ☐

PVC cap ☑

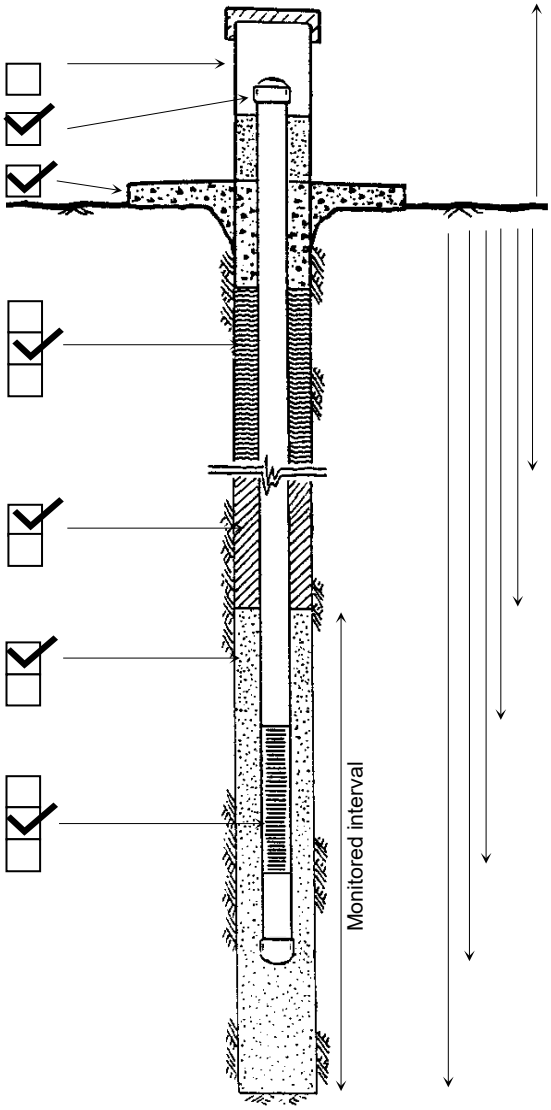
Concrete colar ☑

Back fill type:
Cement bentonite ☐
Soil ☑
None ☐

Seal:
Bentonite pellets ☑
Other ☐

Gravel type:
2-5mm gravel ☑
Other ☐

Perforation type:
Drill holes ☐
Hack saw cuts ☑
40um machine slots ☐



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

SOIL TEST SERVICES
ABN 43 002 145 173

FOUR DAY SOAKED CALIFORNIA BEARING RATIO TEST REPORT

Client: PSM Admin Pty Ltd
PSM Job No.: PSM3530

Report No.: L4970 - 1
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^3)	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^3)	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.

09/01/2024
Authorised Signature / Date
(D. Treweek)

Appendix D
Salinity and Aggressivity Investigation

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

Our Ref: PSM3530-020L 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 ID	pH	Electrical Conductivity [µS/cm]	Resistivity [ohm.cm]	Moisture Content [%]	Chloride by discrete analyser [mg/kg]	Soluble Sulfate by icpaes [mg/kg]	Exchangeable Cations [meq/100g]					ESP [%]
							Ca	Mg	K	Na	CEC	
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_e). The method of conversion from $EC_{1:5}$ to EC_e (electrical conductivity of saturated extract) is based on DLWC (2002) and given by $EC_e = EC_{1:5} \times M$, where M is the multiplication factor based on "Soil Texture Group".

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

Table 2 – Salinity Classification

Sample ID	Sampled Depth (m)	EC1:5 dS/m	Soil Type	M	ECe (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

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

KELVIN LIM
ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

Enc.

Appendix A Laboratory Test Results

Appendix B Salinity Management Plan

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 NORTH RYDE NSW, AUSTRALIA 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 4		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
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.
~ = 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 Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- 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	BH01 3.0m	BH03 6.0m	BH08 1.5m	----	----
			Sampling 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	----	----
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 @ 105-110°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 Alkaline 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	**----**	**----**	**----**

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	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

Work Order	: **ES2344547**	Page	: 1 of 5
Amendment	: **1**		
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 NORTH RYDE NSW, AUSTRALIA 2113	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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	: ----		
Quote number	: EN/333		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
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
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 Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- 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
			Sampling 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 @ 105-110°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 Alkaline 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 Analyser								
Chloride	16887-00-6	10	mg/kg	330	450	280	300	700

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH10 1.5m	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 @ 105-110°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 Alkaline 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 Analyser								
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, sub-surface 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

KELVIN LIM
ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

Appendix E
Interim Geotechnical Design Advice

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

Our Ref: PSM3530-003L 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 SOIL		1.5H : 1.0V	2.0H : 1.0V
BEDROCK UNITS[1]	(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

[1] 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.

Table 2 – Engineering Parameters of Inferred Geotechnical Units

INFERRED UNIT	BULK UNIT WEIGHT (kN/m^3)	SOIL EFFECTIVE STRENGTH PARAMETERS		ULTIMATE BEARING PRESSURE UNDER VERTICAL CENTRIC LOADING (kPa)	ALLOWABLE BEARING PRESSURE UNDER VERTICAL CENTRIC LOADING (kPa)	ULTIMATE SHAFT ADHESION ULTIMATE SHAFT ADHESION (kPa)	ELASTIC PARAMETERS	
		c' (kPa)	ϕ' (deg)				YOUNG's MODULUS (MPa)	POISSON'S RATIO
ENGINEERED FILL	18	0	30	420	150[1]	N.A.	10	0.3
RESIDUAL SOIL	18	0	30	420	150[1]	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

1 Shallow footings (for ABP of 150 kPa) should have a horizontal dimension of 1.0 m; and an embedment depth of 0.5 m.

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

3 *** - 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

KELVIN LIM
ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

Enc.

Figure 1 Staging plan

Figure 2 SSDA Masterplan – Stage 1

mirvac

FIGURE 1

PROPOSED 1.5m HIGH BERM

ENTIRE POND AREA TO BE CLAY LINED UNLESS A DETAILED SALINITY AND SODICITY ASSESSMENT DEMIONSTRATES INFILTRATION OF STORMWATER WILL NOT ADVERSELY IMPACT THE WATER TABLE AND SOIL SALINITY (OR OTHER SOIL CONDITIONS)

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

ROCK SCOUR PROTECTION TO ENGINEER'S DETAIL

LOCATION OF OVERFLOW WEIR

PROPOSED M12 MOTORWAY

PROPOSED EAST WEST RAIL LINK

TITLE BOUNDARY

WIANAMATTA-SOUTH CREEK

WIANAMATTA-SOUTH CREEK

TITLE BOUNDARY

40M VEGETATED RIPARIAN ZONE (VRZ) FROM TOP OF BANK AS PER NRAR GUIDELINES FOR 4TH ORDER AND ABOVE WATERCOURSES

Sydney Water Corporation Potential Sewer Pump Station 3,913 m² , Subject to Separate Application

Drainage Reserve 10,446 m²

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.

LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903

PARK EDGE ROAD 01 (19.5M)

INDUSTRIAL ROAD 02 (24.0M)

INDUSTRIAL ROAD 01 (24.0M)

INDUSTRIAL ROAD 03 (24.0M)

INDUSTRIAL ROAD 04 (24.0M)

LOCAL COLLECTOR ROAD 01 (26.4M)

ELIZABETH DRIVE

Future Building Stage 1

STAGE 1
LOT 100
DP 1283398
Future Building Stage 1

6
WH: 39,540 m²
RL 53.00
(+/- 1000 mm)

2
WH: 15,065 m²
RL 58.00
(+/- 1000 mm)

36m HS

99
Endeavour Energy Potential Substation 12,494m², Subject to Separate Application

STAGE 2
LOT 741
DP 810111
(FUTURE BUILDING STAGE 2 SUBJECT TO FUTURE PLANNING APPLICATION)

TEMPORARY BATTER WORKS / ESTATE ROAD NO.1 AND CONSTRUCTION WORKS ZONE WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 2 - LOT 741 810111. APPROX 40M WIDE.

Electrical Easement 395sqm

TITLE BOUNDARY

UNNAMED ACCESS ROAD

CONSTRUCTION ACCESS VIA EXISTING UNNAMED ROAD

CLEANAWAY FACILITY

LEGEND

- Estate Boundary
- Realigned Boundary Between Stage 1 & Stage 2
- Stage 1A On Lot Works Boundary
- Lot Boundary
- Road Boundary
- Stage 1A Infrastructure Works
- Stage 1A Bulk Earthworks / Temporary Evaporation Basin/ Landscaping Stabilisation
- Stage 1A On Lot Works
- RW Retaining Walls
- ES External Stairs

LOT 2

Site 2 Area	33,234 m²
Warehouse	15,065 m²
Office	1,060 m²
Dock Office	200 m²
GFA	16,325 m²
Carparking Required	83
Cars Provided	84

LOT 6

Site 6 Area	70,705 m²
Warehouse	39,540 m²
Office	1,900 m²
Dock Office	200 m²
GFA	41,640 m²
Carparking Required	185
Cars Provided	186

OVERALL DEVELOPMENT DATA

	Lot 100	Lot 741	Total
Estate Area	390,949 m²	517,759 m²	908,708 m²
Flood Prone Area	175,879 m²	247,829 m²	423,708 m²
Site Area	566,828 m²	765,588 m²	1,332,416 m²
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 m²	368,994 m²	640,822 m²
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
Electrical Easement	-	395 m²	395 m²
Drainage Reserve	10,446 m²	-	10,446 m²
Paths + Accessways	1,590 m²	-	1,590 m²
Potential Road Widening	14,968 m²	-	14,968 m²
Road Reserves + Access Ways	65,113 m²	-	65,113 m²
Zone Substation Allotment	12,494 m²	-	12,494 m²
Flood Prone Area/ ENZ	175,879 m²	247,829 m²	423,708 m²
Temporary Berm + Basin	-	122,675 m²	122,675 m²
Potential Sewer Pump Station	3,913 m²	-	3,913 m²
Non Developable Area	295,000 m²	396,594 m²	691,594 m²

SBA ARCHITECTS
Commercial Industrial Residential Retail Industrial Design
Suite 702, 83 Mount Street, North Sydney, NSW 2060
T: 02 9929 9988 F: 02 9929 8899
E: info@sbaarch.com.au W: www.sbaarch.com.au

ISSUE	REV. DESCRIPTION	DATE
A	ISSUED FOR DA	03.12.21
B	FOR INFORMATION	16.05.22
C	AMENDMENT TO DA	15.09.22
D	RESPONSE TO TOA	23.03.23
E	FOR INFORMATION	12.02.24
F	FOR INFORMATION	17.12.24
G	FOR INFORMATION	10.02.25
H	FOR INFORMATION	19.02.25

Mirvac Design
architects
planners
interior designers
Level 28, 200 George St.
Sydney NSW, 2000
tel. 02 9080 8000
fax. 02 9080 8181
Mirvac Design Pty. Ltd.
ABN 78 003 359 153

ELIZABETH ENTERPRISE PRECINCT

LOT 100 DP1283398 + LOT 741 DP 810111
BADGERYS CREEK NSW

0 60 300

NORTH

DRAWING TITLE
ESTATE WORKS STAGING PLAN - STAGE 1a

DATE	SCALE	JOB NO	DRAWING NO	
19.02.25	1:3000@A1 1:6000@A3	20266	MP 03	H

FIGURE 2

mirvac

WIANAMATTA-SOUTH CREEK

TOP OF BANK

TOP OF BATTER

Drainage Reserve
10,446 m²

Sydney Water Corporation
Potential Sewer Pump Station
3,913 m² , Subject to
Separate Application

PARK EDGE STREET 01 TO CONTINUE THROUGH TO STAGE 2 DEVELOPMENT, SUBJECT TO FUTURE DEVELOPMENT APPLICATIONS

PARK EDGE ROAD 01 (19.5M)

INDUSTRIAL ROAD 01 (24.0M)

INDUSTRIAL ROAD 02 (24.0M)

INDUSTRIAL ROAD 03 (24.0M)

INDUSTRIAL ROAD 04 (24.0M)

LOCAL COLLECTOR ROAD 01 (26.4M)

LOCAL COLLECTOR ROAD 02 (26.4M)

ELIZABETH DRIVE

TITLE BOUNDARY

UNNAMED ACCESS ROAD

Warehouse 8
WH: 20,170 m²
RL 46.50
(+/- 1000 mm)

Site 3
3,808 m²
Amenity Node
RL 47.00

Warehouse 7
WH: 38,310 m²
RL 49.50
(+/- 1000 mm)

Warehouse 6
WH: 39,540 m²
RL 53.00
(+/- 1000 mm)

Warehouse 5
WH: 5,330 m²
RL 49.00
(+/- 1000 mm)

Warehouse 4
WH: 7,340 m²
RL 52.50
(+/- 1000 mm)

Warehouse 2
WH: 15,065 m²
RL 58.00
(+/- 1000 mm)

Warehouse 1
WH: 3,200 m²
RL 59.00
(+/- 1000 mm)

99
Endeavour Energy
Potential Substation
12,494m², Subject to
Separate Application
RL 58.00
(±1000 mm)

STAGE 2
LOT 741
DP 810111
(SUBJECT TO FUTURE PLANNING APPLICATION)

STAGE 1
LOT 100
DP 1283398

TEMPORARY BATTER WORKS / ESTATE ROAD NO.1 AND CONSTRUCTION WORKS ZONE WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 2 - LOT 741 810111. WORKS ZONE APPROX 100M WIDE.

LOCAL COLLECTOR ROAD TO CONTINUE THROUGH TO MIRVAC STAGE 2 DEVELOPMENT, SUBJECT TO FUTURE DEVELOPMENT APPLICATIONS

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.

LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP

ZONE OF BATTER WORKS WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 1, LOT 100 DP 1283398.

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903

HERITAGE INTERPRETATION FEATURE LANDSCAPE 1,057 m²

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

CONSTRUCTION ACCESS VIA EXISTING UNNAMED ROAD

LEGEND

- Estate Boundary
- Realigned Boundary Between Stage 1 & Stage 2
- Lot Boundary
- Road Boundary
- Building Setback
- Landscape Setback
- Building Above Outline
- SS Substation Indicative Location
- FS Fire Services
- FB Fire Brigade Truck Parking
- RW Rainwater Tank
- AC AC Plant Indicative Location
- ES External Stair
- Electrical Charging Parking Bay
- Electrical Charging Parking Bay (with canopy)
- RW Retaining Wall

LOT DEVELOPMENT DATA

Site 1 Area	12,900 m²
Warehouse	3,200 m²
Office	830 m²
Dock Office	100 m²
GFA	4,130 m²
Cars Provided	35
Site 2 Area	33,234 m²
Warehouse	15,065 m²
Office	1,060 m²
Dock Office	200 m²
GFA	16,325 m²
Cars Provided	84
Cafe (Site 3)	150 m²
Cars Provided	23
Site 4 Area	23,907 m²
Warehouse	7,340 m²
Office	1,650 m²
GFA	8,990 m²
Cars Provided	69
Site 5 Area	18,014 m²
Warehouse	5,330 m²
Office	1,410 m²
Dock Office	100 m²
GFA	6,840 m²
Cars Provided	56
Site 6 Area	70,705 m²
Warehouse	39,540 m²
Office	1,900 m²
Dock Office	200 m²
GFA	41,640 m²
Cars Provided	186
Site 7 Area	69,372 m²
Warehouse	38,310 m²
Office	1,900 m²
Dock Office	200 m²
GFA	40,410 m²
Cars Provided	182
Site 8 Area	39,888 m²
Warehouse	20,170 m²
Office	1,000 m²
Dock Office	200 m²
GFA	21,370 m²
Cars Provided	102

OVERALL DEVELOPMENT DATA

	Stage 1 Lot 100	Stage 2 Lot 741	Total
Estate Area	390,949 m²	517,759 m²	908,708 m²
Flood Prone Area	175,879 m²	247,829 m²	423,708 m²
Site Area	566,828 m²	765,588 m²	1,332,416 m²
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 m²	368,994 m²	640,822 m²
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
Electrical Easement	-	395 m²	395 m²
Drainage Reserve	10,446 m²	-	10,446 m²
Paths + Accessways	1,590 m²	-	1,590 m²
Potential Road Widening	14,968 m²	-	14,968 m²
Road Reserves + Access Ways	65,113 m²	-	65,113 m²
Zone Substation Allotment	12,494 m²	-	12,494 m²
Flood Prone Area/ ENZ	175,879 m²	247,829 m²	423,708 m²
Temporary Berm + Basin	-	122,675 m²	122,675 m²
Potential Sewer Pump Station	3,913 m²	-	3,913 m²
Non Developable Area	295,000 m²	396,594 m²	691,594 m²
Pervious Area (Please refer to MP15)	96,919 m²	368,994 m²	465,913 m²
Site Coverage (of developable area)	51.4%	0%	21.8%
Carparking	737		

SBA ARCHITECTS
Commercial Industrial Residential Retail Industrial Design
Suite 702, 80 Mount Street, North Sydney, NSW 2060
T: 02 9929 9988 F: 02 9929 8999
E: info@sbaarch.com.au W: www.sbaarch.com.au

ISSUE	REV. DESCRIPTION	DATE
B	FOR INFORMATION	16.05.22
C	AMENDMENT TO DA	15.09.22
D	ISSUED FOR DA	21.12.22
E	FOR INFORMATION	15.03.23
F	RESPONSE TO TOA	21.03.23
G	FOR INFORMATION	12.02.24
H	FOR INFORMATION	18.11.24
J	FOR INFORMATION	11.12.24
K	FOR INFORMATION	17.12.24
L	FOR INFORMATION	10.02.25
M	FOR INFORMATION	19.02.25

Mirvac Design
architects
planners
interior designers
Level 28, 200 George St.
Sydney NSW, 2000
tel. 02 9080 8000
fax. 02 9080 8181
Mirvac Design Pty. Ltd.
ABN 78 003 359 153

ELIZABETH ENTERPRISE PRECINCT

LOT 100 DP1283398 + LOT 741 DP 810111
BADGERYS CREEK NSW

0 30 150

NORTH

DRAWING TITLE
SSDA MASTERPLAN - STAGE 1

DATE 19.02.25
SCALE 1:1500@A1 1:3000@A3
JOB NO. 20266
DRAWING NO. MP 02
M

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

Table of Contents

List of Appendices

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 **3.0 m** 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:

1. 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^3 and 100 $m^{3.}$
   a. 2 tests per lot.
3. For lot greater than 100 $m^{3.}$
   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^3 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

mirvac

PROPOSED 1.5m HIGH BERM

ENTIRE POND AREA TO BE CLAY LINED UNLESS A DETAILED SALINITY AND SODICITY ASSESSMENT DEMIONSTRATES INFILTRATION OF STORMWATER WILL NOT ADVERSELY IMPACT THE WATER TABLE AND SOIL SALINITY (OR OTHER SOIL CONDITIONS)

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

ROCK SCOUR PROTECTION TO ENGINEER'S DETAIL

LOCATION OF OVERFLOW WEIR

PROPOSED M12 MOTORWAY

PROPOSED EAST WEST RAIL LINK

TITLE BOUNDARY

WIANAMATTA-SOUTH CREEK

WIANAMATTA-SOUTH CREEK

40M VEGETATED RIPARIAN ZONE (VRZ) FROM TOP OF BANK AS PER NRAR GUIDELINES FOR 4TH ORDER AND ABOVE WATERCOURSES

Sydney Water Corporation Potential Sewer Pump Station 3,913 m² , Subject to Separate Application

Drainage Reserve 10,446 m²

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.

LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903

PARK EDGE ROAD 01 (19.5M)

INDUSTRIAL ROAD 02 (24.0M)

INDUSTRIAL ROAD 01 (24.0M)

INDUSTRIAL ROAD 03 (24.0M)

INDUSTRIAL ROAD 04 (24.0M)

LOCAL COLLECTOR ROAD 01 (26.4M)

ELIZABETH DRIVE

Future Building Stage 1

STAGE 1
LOT 100
DP 1283398
Future Building Stage 1

6
WH: 39,540 m²
RL 53.00
(+/- 1000 mm)

2
WH: 15,065 m²
RL 58.00
(+/- 1000 mm)

99
Endeavour Energy Potential Substation 12,494m², Subject to Separate Application

STAGE 2
LOT 741
DP 810111
(FUTURE BUILDING STAGE 2 SUBJECT TO FUTURE PLANNING APPLICATION)

TEMPORARY BATTER WORKS / ESTATE ROAD NO.1 AND CONSTRUCTION WORKS ZONE WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 2 - LOT 741 810111. APPROX 40M WIDE.

Electrical Easement 395sqm

UNNAMED ACCESS ROAD

CONSTRUCTION ACCESS VIA EXISTING UNNAMED ROAD

CLEANAWAY FACILITY

LEGEND

- Estate Boundary
- Realigned Boundary Between Stage 1 & Stage 2
- Stage 1A On Lot Works Boundary
- Lot Boundary
- Road Boundary
- Stage 1A Infrastructure Works
- Stage 1A Bulk Earthworks / Temporary Evaporation Basin/ Landscaping Stabilisation
- Stage 1A On Lot Works
- RW Retaining Walls
- ES External Stairs

LOT 2

Site 2 Area	33,234 m²
Warehouse	15,065 m²
Office	1,060 m²
Dock Office	200 m²
GFA	16,325 m²
Carparking Required	83
Cars Provided	84

LOT 6

Site 6 Area	70,705 m²
Warehouse	39,540 m²
Office	1,900 m²
Dock Office	200 m²
GFA	41,640 m²
Carparking Required	185
Cars Provided	186

OVERALL DEVELOPMENT DATA

	Lot 100	Lot 741	Total
Estate Area	390,949 m²	517,759 m²	908,708 m²
Flood Prone Area	175,879 m²	247,829 m²	423,708 m²
Site Area	566,828 m²	765,588 m²	1,332,416 m²
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 m²	368,994 m²	640,822 m²
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
Electrical Easement	-	395 m²	395 m²
Drainage Reserve	10,446 m²	-	10,446 m²
Paths + Accessways	1,590 m²	-	1,590 m²
Potential Road Widening	14,968 m²	-	14,968 m²
Road Reserves + Access Ways	65,113 m²	-	65,113 m²
Zone Substation Allotment	12,494 m²	-	12,494 m²
Flood Prone Area/ ENZ	175,879 m²	247,829 m²	423,708 m²
Temporary Berm + Basin	-	122,675 m²	122,675 m²
Potential Sewer Pump Station	3,913 m²	-	3,913 m²
Non Developable Area	295,000 m²	396,594 m²	691,594 m²

SBA ARCHITECTS
Commercial Industrial Residential Retail Industrial Design
Suite 702, 83 Mount Street, North Sydney, NSW 2060
T: 02 9929 9988 F: 02 9929 8899
E: info@sbaarch.com.au W: www.sbaarch.com.au

ISSUE	REV. DESCRIPTION	DATE
A	ISSUED FOR DA	03.12.21
B	FOR INFORMATION	16.05.22
C	AMENDMENT TO DA	15.09.22
D	RESPONSE TO TOA	23.03.23
E	FOR INFORMATION	12.02.24
F	FOR INFORMATION	17.12.24
G	FOR INFORMATION	10.02.25
H	FOR INFORMATION	19.02.25

Mirvac Design
architects
planners
interior designers
Level 28, 200 George St.
Sydney NSW, 2000
tel. 02 9080 8000
fax. 02 9080 8181
Mirvac Design Pty. Ltd.
ABN 78 003 359 153

ELIZABETH ENTERPRISE PRECINCT

LOT 100 DP1283398 + LOT 741 DP 810111
BADGERYS CREEK NSW

0 60 300

NORTH

DRAWING TITLE
ESTATE WORKS STAGING PLAN - STAGE 1a

DATE	SCALE	JOB NO	DRAWING NO	
19.02.25	1:3000@A1 1:6000@A3	20266	MP 03	H

mirvac

PARK EDGE STREET 01 TO CONTINUE THROUGH TO STAGE 2 DEVELOPMENT, SUBJECT TO FUTURE DEVELOPMENT APPLICATIONS

TEMPORARY BATTER WORKS / ESTATE ROAD NO.1 AND CONSTRUCTION WORKS ZONE WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 2 - LOT 741 810111. WORKS ZONE APPROX 100M WIDE.

LOCAL COLLECTOR ROAD TO CONTINUE THROUGH TO MIRVAC STAGE 2 DEVELOPMENT, SUBJECT TO FUTURE DEVELOPMENT APPLICATIONS

STAGE 2
LOT 741
DP 810111
(SUBJECT TO FUTURE PLANNING APPLICATION)

STAGE 1
LOT 100
DP 1283398

TOP OF BATTER

TOP OF BANK

WIANAMATTA-SOUTH CREEK

Drainage Reserve
10,446 m²

Sydney Water Corporation
Potential Sewer Pump Station
3,913 m² , Subject to
Separate Application

PARK EDGE ROAD 01 (19.5M)

INDUSTRIAL ROAD 01 (24.0M)

INDUSTRIAL ROAD 02 (24.0M)

INDUSTRIAL ROAD 03 (24.0M)

INDUSTRIAL ROAD 04 (24.0M)

LOCAL COLLECTOR ROAD 02 (26.4M)

LOCAL COLLECTOR ROAD 01 (26.4M)

ELIZABETH DRIVE

TITLE BOUNDARY

UNNAMED ACCESS ROAD

Warehouse (8)
WH: 20,170 m²
RL 46.50
(+/- 1000 mm)

Warehouse (7)
WH: 38,310 m²
RL 49.50
(+/- 1000 mm)

Warehouse (6)
WH: 39,540 m²
RL 53.00
(+/- 1000 mm)

Warehouse (5)
WH: 5,330 m²
RL 49.00
(+/- 1000 mm)

Warehouse (4)
WH: 7,340 m²
RL 52.50
(+/- 1000 mm)

Warehouse (2)
WH: 15,065 m²
RL 58.00
(+/- 1000 mm)

Warehouse (1)
WH: 3,200 m²
RL 59.00
(+/- 1000 mm)

Site 3
3,808 m²
Amenity Node
RL 47.00

99
Endeavour Energy
Potential Substation
12,494m², Subject to
Separate Application
RL 58.00
(±1000 mm)

36m HS

0.5m wide Pedestrian and Cycle Path

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.

LINE OF ZONING BOUNDARY AS PER SEPP WSA 2020 LAND ZONING MAP

ZONE OF BATTER WORKS WITHIN MIRVAC ELIZABETH ENTERPRISE PRECINCT STAGE 1, LOT 100 DP 1283398.

DEMOLITION + REMEDIATION WORKS FOR THE ENTIRETY OF LOT 100 + LOT 741 FOR ALL IMPROVEMENTS

POTENTIAL FUTURE ELIZABETH DRIVE WIDENING SUBJECT TO JUST TERMS ACQUISITION, TfNSW PLAN REF: DS 2020/000903

HERITAGE INTERPRETATION FEATURE LANDSCAPE 1,057 m²

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

CONSTRUCTION ACCESS VIA EXISTING UNNAMED ROAD

LEGEND

- Estate Boundary
- Realigned Boundary Between Stage 1 & Stage 2
- Lot Boundary
- Road Boundary
- Building Setback
- Landscape Setback
- Building Above Outline
- SS Substation Indicative Location
- FS Fire Services
- FB Fire Brigade Truck Parking
- RW Rainwater Tank
- AC AC Plant Indicative Location
- ES External Stair
- Electrical Charging Parking Bay
- Electrical Charging Parking Bay (with canopy)
- RW Retaining Wall

LOT DEVELOPMENT DATA

Site 1 Area	12,900 m²
Warehouse	3,200 m²
Office	830 m²
Dock Office	100 m²
GFA	4,130 m²
Cars Provided	35
Site 2 Area	33,234 m²
Warehouse	15,065 m²
Office	1,060 m²
Dock Office	200 m²
GFA	16,325 m²
Cars Provided	84
Cafe (Site 3)	150 m²
Cars Provided	23
Site 4 Area	23,907 m²
Warehouse	7,340 m²
Office	1,650 m²
GFA	8,990 m²
Cars Provided	69
Site 5 Area	18,014 m²
Warehouse	5,330 m²
Office	1,410 m²
Dock Office	100 m²
GFA	6,840 m²
Cars Provided	56
Site 6 Area	70,705 m²
Warehouse	39,540 m²
Office	1,900 m²
Dock Office	200 m²
GFA	41,640 m²
Cars Provided	186
Site 7 Area	69,372 m²
Warehouse	38,310 m²
Office	1,900 m²
Dock Office	200 m²
GFA	40,410 m²
Cars Provided	182
Site 8 Area	39,888 m²
Warehouse	20,170 m²
Office	1,000 m²
Dock Office	200 m²
GFA	21,370 m²
Cars Provided	102

OVERALL DEVELOPMENT DATA

	Stage 1 Lot 100	Stage 2 Lot 741	Total
Estate Area	390,949 m²	517,759 m²	908,708 m²
Flood Prone Area	175,879 m²	247,829 m²	423,708 m²
Site Area	566,828 m²	765,588 m²	1,332,416 m²
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 m²	368,994 m²	640,822 m²
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
Electrical Easement	-	395 m²	395 m²
Drainage Reserve	10,446 m²	-	10,446 m²
Paths + Accessways	1,590 m²	-	1,590 m²
Potential Road Widening	14,968 m²	-	14,968 m²
Road Reserves + Access Ways	65,113 m²	-	65,113 m²
Zone Substation Allotment	12,494 m²	-	12,494 m²
Flood Prone Area/ ENZ	175,879 m²	247,829 m²	423,708 m²
Temporary Berm + Basin	-	122,675 m²	122,675 m²
Potential Sewer Pump Station	3,913 m²	-	3,913 m²
Non Developable Area	295,000 m²	396,594 m²	691,594 m²
Pervious Area (Please refer to MP15)	96,919 m²	368,994 m²	465,913 m²
Site Coverage (of developable area)	51.4%	0%	21.8%
Carparking	737		

SBA ARCHITECTS
Commercial Industrial Residential Retail Industrial Design
Suite 702, 80 Mount Street, North Sydney, NSW 2060
T: 02 9929 9988 F: 02 9929 8999
E: info@sbaarch.com.au W: www.sbaarch.com.au

ISSUE	REV. DESCRIPTION	DATE
B	FOR INFORMATION	16.05.22
C	AMENDMENT TO DA	15.09.22
D	ISSUED FOR DA	21.12.22
E	FOR INFORMATION	15.03.23
F	RESPONSE TO TOA	21.03.23
G	FOR INFORMATION	12.02.24
H	FOR INFORMATION	18.11.24
J	FOR INFORMATION	11.12.24
K	FOR INFORMATION	17.12.24
L	FOR INFORMATION	10.02.25
M	FOR INFORMATION	19.02.25

Mirvac Design
architects
planners
interior designers
Level 28, 200 George St.
Sydney NSW, 2000
tel. 02 9080 8000
fax. 02 9080 8181
Mirvac Design Pty. Ltd.
ABN 78 003 359 153

ELIZABETH ENTERPRISE PRECINCT

LOT 100 DP1283398 + LOT 741 DP 810111
BADGERYS CREEK NSW

0 30 150

NORTH

DRAWING TITLE
SSDA MASTERPLAN - STAGE 1

DATE 19.02.25
SCALE 1:1500@A1 1:3000@A3
JOB NO. 20266
DRAWING NO. MP 02
M

Attachment 2
Subgrade Approval Report (Sample Only)

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY

NATA accreditation number

SUBGRADE APPROVAL REPORT

Client:	Contractor:
Job number:	Report number:
Project:	Technician:

Subgrade areas assessed:

Area ID	Date	Approximate extent	Subgrade description	Geometry summary	Specification reference	Compliance (Pass/Fail)	Survey reference	Approved (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:
Job number:	Report date:
Project:	Technician:
Contractor:	Test methods:

LOT ID: Sheet of

Retest (Yes/No) Original test report number:

Specification reference

Location:

Lot boundary survey reference/location:

Materials description: *(MATERIAL TYPE, colour, minor components, maximum particle size)*

Material identification: *(Identify the material as defined in Clause 2.3.1, Clause 2.3.2, or Clause 2.3.3 of the Specification)*

Deleterious material assessment: *(Report proportion of deleterious material)*

Layer thickness:

Accepted as Lot: (Yes/No) Date:

Approximate volume (m3) Number of tests required:

Test ID No.				
Test soil description				
Date tested:				
Grid reference				
Surveyed test locations (RL,E,N)				
Test depth (mm)				
Max size (mm)				
% Oversize material (wet)				
Field wet density (t/m^3)				
Field moisture content (%)				
PWCD (t/m^3)				
Compactive effort				
Moisture variation (%)				
HILF density ratio (%)				
TEST (Pass/Fail)				

LOT APPROVAL (Pass/Fail) Signed: Date:

Attachment 4
Daily Report (Sample Only)

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY

NATA accreditation number

DAILY REPORT

Client:	Report number:
Job number:	Report date:
Project:	
Location:	Level of testing: Level 1
Contractor	Technician:

Time on site:
Time off site:

1. Subgrade Approval

Areas ID	Subgrade Approval Report No:	Comments

2. Lot Approval

Lot ID	Lot Approval Report No:	Comments

3. Survey

Type of survey	Survey undertaken by:	Reference

4. Instructions received on site

5. Instructions given on site

COMMENTS:

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. ……
- The following subgrade survey was undertaken:
  1. Subgrade Survey reference……
  2. ……
- 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:

1. List outstanding issues (not approved subgrade, lots, unsuitable material, failed tests etc.)
2. ……..

Signed

GITA